CHAPTER-5

PHYSIOGRAPHY OF SHIVPURI AND RAGHOGARH REGIONS

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The district lies in the northern part of the Vindhyan Plateau. The western halt, formed of the Vindhyan rocks, is the northern extention of the Malwa Plateau, deprived of its trappean cover. A small area in the south-western part of the district is still under the Basalt. The eastern half of the district is comparatively a lower plateau. The Bundelkhand granites, interspersed with low and narrow ridges, sills and dykes, extend in this part. The general height of the district is about 350 meters above mean sea level.

The district is drained by three important rivers, namely, the Betwa, the Sindh and the Kuno, which have carved narrow valleys over the plateau. Thus the whole of the district can be described under the following five physiographic divisions:-

1. The Western Plateau.
2. The Lower Bundelkhand Plateau.
3. The Betwa Valley.
4. The Sindh Valley, and
5. The Kuno Valley.

5.1 The Western Plateau:

The western plateau extends over the larger half of the district. It is the northern extention of the Malwa plateau the general height is about 400 meters. It is widely composed of sandstones with at least two ridges of hills traversing from south to north. The intermediate belts are comparatively flat zones or narrow valleys. They contain better soil and some cultivated patches.

The eastern margin of the plateau is marked by the Eastern Vindyhyan (off shoot) Range and its scarps facing east, starting from Malthone in Sagar district. It traverses north-west through Deogarh in Lalitpur, Chanderi and Isagarh in Guna and Narwar in Shivpuri, to Gwalior fort hill in the north. This Range enters Shivpuri at Golakot Pathar (489.2 meters) in the south east. It extends to the north through the hills of Gudar, Bel-Bauri, Parora and Bhopali. The ridge discontinues from here upto Amlot on Jhansi-Shivpuri Road. It regains height from Dangipura, Shergarh (449.3 meters) and Narwar–South (453.8 meters) is prominent peaks in this part.

The western vindhyan (Off shoot) Range originates from Amjhera in Dhar District and passes north-east wards through Neemuch, Agar, Shajapur, Rajgarh, Narsingarh and Berasia tahsil of Bhopal. It crosses Guna through Maksoodangarh, Bajrangarh and Mahudra hills. The Range enters Shivpuri district through Patiwara hill (520.6 meters) in the south. It widens near Kolaras and is conjoined with the Eastern

Vindhyachal Range. It forms the Shivpuri plateau which runs further north in the hills of Ghatigaon in Gwalior district. Its north-western branch forms the Sheopur plateau of Morena district, which is also marke by the narrow valleys of the Kuno and the Kunwari. The western range is narrowly separated from the Eastern one, in this district, by the river Sindh. The scraps of Narwar hill (Eastern Range) continue in the west side of the river upto Aron in Gwalior. Some of the peaks on this range are Dhua (514.2 meters), Rijhari (499.2 meters) Tonga (541.8 meters), Mamoni (448.3 meters), Jhiri (456.9 meters), Barod (450.3 meters), Birra (474.9 meters), Subhashpura (450.6 meters).

The western part of the Plateau eroded by the Kuno River exhibits a continuous scrap to the west of the river. It runs from Guna District to Sheopur Sub-Division of Morena through Shahabad (Kota Rajasthan), and Pohri Tahsil of Shivpuri.

5.2 The Lower Bundelkhand Plateau:

The eastern part of the district is a plateau about 300 m. above mean sea level. It is formed of the Bundelkhand granites and gneisses, which underlie the Vindhayans. It is marked by the dykes and sills traversing for varying length in a direction from south-west to north-east. Sometimes these also form narrow ridges. The rivers and minor streams of the plateau also traverse in this direction. The longest of the ridges is marked to the west of the Betwa valley. It extends from Khaniadhana to Panihar in the south-eastern part of the district. The north-eastern part is marked by multitude of ridges. These are marked at Ganj-Dinara, Golta, Karera, Narhi, Karhi and Sonar. The area is covered with a thin mantle of soil, except along the rivers.

5.3 The Betwa Valley:

The Betwa valley lies in the south-eastern part of the district. It is 5 to 25 km. wide along the river. Most of it lies on the Lower Bundelkhand plateau.

5.4 The Sind Valley:

The upper valley of the Sind lies in a narrow belt across the central part of the District from south-west to north east. It lies on the Vindhyans and as is about 25 km. wide up to Kolaras in the Southern part. It crosses a branch of the Eastern Vindhyachal Range between Bhagora and Birghat first, and the Range itself between Amola and Narwar, finally.

The river turns to the east above Narwar and to the north-east at Behgama further down. The lower valley rests on the more open plateau of Bundelkhand, conjoined with the tributary valleys of the Sind and the Mahuar. Here it is a really wide valley with large patches of mixed soil.

5.5 The Kuno Valley:

It is a narrow valley which extends along the western margins of the district, in Kolaras and Pohri Tahsils. It is bound by a scrap of Bhander Sandstone with a limestone bed in the west.

5.6 Forest:

The total area of the forest in Shivpuri district was 6,167.92 sq. km. Of these an area of 1,798.28 sq. km. falls under the reserved forests. The protected forest covered 4,369.65 sq. km. and the un-classed forests 2,759.73 sq. km. The tahsil wise and range wise area of reserved and protected forests until 1976 is given as under:-

Table 5.1

Tahsil and Range wise Area of Reserved and Protected Forests:

Range	Tahsil	Reserved Forest in sq. km.	Protected Forest in sq. km.
Shivpuri	Shivpuri	267.87	388.38
Satanwara	Shivpuri	576.92	742.60
Kolaras	Kolaras	522.40	617.87
Pichhore	Pichhore	264.13	1,196.42
Karera	Karera	166.95	967.38
Pohri	Pohri	00	577.00
Total Forest of the Divisions	**District Shivpuri**	**1,798.27**	**4,369.65**

In the year 1977, the unclassed forests were amalgamated into the Protected Forests. Out of these, 5,514.04 sq. km. was transferred to the Revenue Department for settlement and other purposes. This reduced the total forest area to 3,413.61 sq. km. and the Protected Forests to 1,615.34 sq. km. The area of reserves continues to be 1,798.27 sq. km.

5.7 Forest Belts:

The forests of the district extend in three major belts and patches aligned from south to north, along the hill ranges. These are separated by the settled and cultivated tracts of the Betwa, the Sind and the kuno valleys. The central belt extends from Inder *nala* in the south to Narwar in the north. This belt widens in the north and extends upto the upper course of the Parbati. The eastern belt of the forests extends along the Mahuar and on the hills of Khaniadhana in Pichhore and Karera tahsils. The western forest belt extends along the Western boundary from Kishanpur to Phota, and Pohri to Richan.

5.8 Forests Types and Characteristics:

The natural forests of the district are divided into three main types according to the revised classification offered by H.G. Champion and V.K. Seth. They are Type 5(A) Southern Tropical Dry Deciduous Forests, Type 5(B), Northern Tropical Dry Deciduous Forests, and Type 6(B) Northern Tropical Thorn Forests.

(i) Type 5 A-Southern Tropical Dry Deciduous Forests:

The southern tropical dry deciduous forests extend in the area with the maximum temperature ranging between 29° C. to 35° c. and minimum temperature ranging between 18° C. to 35° C. and with an average rainfall not exceeding 900 mm. In Shivpuri district these forests extend in a limited area in Raipur and Shergarh reserves of Satanwara Range and Digdoli, and Bhainsrawan Tuki Protected blocks of Pichhore Range. Only one Sub type 5 A/C-1 (a) eary Dry Teak Forests occurs in the region. The type is marked by the presence of low quality (IV B to VI) teak trees. Its proportion ranges from 15 to 30 per cent of the tree-stock. Natural reproduction is sufficient in seedling and sapling stages but deficient in later stages. The other species are similar to type 5-B northern tropical dry deciduous forests, dealt here after. The total area of teak forests is 2,011.80 hectare.

(ii) Type 5-B Northern Tropical Dry Mixed Deciduous Forests:

The dry mixed forests form the main type of the forests in the district and occupy the largest of the local forest area. This Northern type occurs in the area with 15°C. To 31°C. Temperature in June (Maximum) and the minimum temperature ranging between 0°C. To 14° C. in January. The average annual rainfall required is the same as in the Southern type that is less than 900 mm. The type in the district is represented by a meager presence or complete absence of teak and the predominance of a large variety of dry species among the trees. The general composition of the forests is as follows:-

Tree Species:- *Sagon (Tectona grandis), Salai (Boswellia serrata), Jhingan dhaora (Anogeissus latifolia), kardhai (Anogeissus pendula), Kund Tendu (Diosporos melanoxylon), Palas (Butea monosperma), Jamrasi (Eleodendron glancum), Achar (Buchanania lanzan), Ber (Zizyphus jujuba), Kankar amola (Emblica officianalis), Tinsa (Ougeinia oojeinensis), Saj (Terminalia tomentosa), Kala siras (Abbizzia lebbeck), Bahera (Terminalia bellirica), Hardon Dhaman (Grewia tilliafolia) etc.* The quality as well as the density of the forest is very low. There is no second storey.

Herbs:- Panwar (*Cassia tora*), Kuretha, Karonda (*Cassia opaca), Lantana (Lantana camara), Piavansa* chirchira *(Achvranthes aspera) etc.*

Grasses: - The common species of grasses are kusul *(*Heteropogon contortus*), senda (*Sehima nervosum*), steps Qunher (*Themeda quadrivalvis) *and Mushan (*Iscilema laxuma).

Creapers:- *Malkhangani (Celastrus paniculata), Dudhi (Marsdenia tenacissima), Guni (Abrus precatorius ari), Palasbel (Butea superba)* .

The northern tropical dry mixed deciduous forests show some marked variations in the predominance of some species. Such sub types recognized are khair Salai, Dhaora, Kardhai and Mixed. The Range wise area under each of the sub types, along with Mixed and Scrub, and Teak is as follows:-

Table 5.2

Area under Sub-Types of Mixed Forests:

Range	Khair	Salai	Dhaora (Anogeissus)	Kardhai	Shrub & Grass	Teak
1	**2**	**3**	**4**	**5**	**6**	**7**
Shivpuri	14,943	9,717	2,015	1,337	2,156	--
Kolaras	52,933	1,769	11,243	20,455	1,671	--
Pichhore	13,337	8,511	21,854	2,841	4,220	242.9
Karera	17,003	9,856	8,616	1,395	410	--
Satanwara	25,035	37,682	6,564	7,487	7,510	1,768.9
Total	**123,251**	**67,536**	**46,225**	**33,515**	**15,967**	**2,011.8**

Khair *(Acacia catechu)* forests occur over a large area, about a fifth of the local forests. Like *kardhai* in Sheopur forest division of Morena district, *khair* is the principal species of Shivpuri forests. The trees are stunted in growth with heights ranging between 3m. to 4.5 m. and a girth of 0.3 m. The best *Khair* patches are found on alluminum with heights up to 7.3 m.

Sub-Type 5B/E-2, *Salai* forests occur on high plateaus and steep upper slopes of hills with dry conditions, especially shallow soil on vindhyan formations. They are found in pure patches in Raipur, Shergarh, Mamoni, Ghasari and Khajuri reserved blocks, as also in the protected forests of Amola, Gudar Badari, Chandauni and Kudi Blociks.

Sub-Type 5B/E-1, *Kardhai* forests occurs on sandstone and occasionally on genesis and trap. The reserved forest of Panihar, Sewan, Akoda, Lakhari, Ghasari,

Mamoni, Raipur, Hirapur and Narwar Blocks ideally represents this type. They also occur in the Protected Forests of Bira, Pohri and Kudi Blocks.

Dhow *(Anogeissus latifolia)* forests are met with in localities where soil has good moisture and is well drained. Prominent places of the type are Chichore, Khari, Jhanpri, Dongri and Subhashpura (Chorepura). The height is between 6 to 7.5 metres and girth between 45 to 55 cm.

The rest of the mixed forests under the northern tropical dry deciduous forests have been treated under the class mixed forests with shrub and grasslands. This is met with widely on exposed sandstone rocks and in localities with low moisture conditions. The crown of the trees is extremely poor and they look very miserable, the height being 2.4 to 3 metres, and girth only about 25 cms. The common species are *palas (Butea monosperma), khair (Acacia catechu), tendu (Diospyros melanoxylon), ber (Zyizyphus jujuba) etc.*

The areas reserved for the growth of fodder grasses are typical. It also contains scrub and thorny growth. The grasslands are divided into two classes. The Military grass reserves and the Public grass reserves. The common grasses are *guner (Themeda quadrivalvis), sahi (Sehima neroosum), michai (Iscilema laxum), Forwa (Heteropogon contortus)* etc.

(iii) Type 6-B Northern Tropical Thorn Forests:

Exclusively thorn forests occur on the rocky and eroded lands with low moisture, and dry ravines. The reserved blocks of Mehmood, Chhattisia, Chironjee, Jhopadi, Khadi, Serguda, Barai Khera and Betwa are its examples. Part of Digdali protected block also comes under this type.

5.8 National park and sanctuaries:-

In order to provide care free natural environment for the wild life and to provide the facilities to the sight seekers for watching them in their natural habitat the Madhav National Park, Shivpuri was created in the year 1958. Formerly it was a pleasure land and *shikar preserve* of Scindias. The personal interests of the then Maharaja are reflected in fine drives, neatly constructed chateaus and observation towers on well selected sites from where one can get a panoramic view of the surrounding areas in all its grandeur. It extended about 27.4 km. from north to south in Chironji, Mamoni and Satanwara Reserves, east and north-east of Shivpuri town. Its width ranges from 3kms. in the mid-length to 9kms. at ends. The total area in the seventies was 67 sq. miles (174 sq.kms.). The area being hilly and forested, it provides natural hide-outs to the wild animals. In

addition to its being traversed by perennial streams, it contains the Madhav Sagar and Sakhya Sagar lakes to quench the thirst of the animals. An area of 181.278 sq. km., called as Extension Area was added to the existing area in 1982. The name of the park was also changed to Madhav National Park in the year 1977. Being very close to Shivpuri town it provides very convenient approaches through the Agra-Bombay national Highway and other motor-able roads and the splendid George Castle and a forest rest house to facilitate the sight-seekers. In addition there are Rest House and the Circuit House of the Public Works Department, Hotel run by the Tourist Development Corporation and public hotels and lodges at Shivpuri.

George castle is situated at the highest (1587°) point of the park. This beautiful building was build for one night stay of the George V. He could not come to the point as he shot a tiger at Mohna itself. The National Park being far away from the large cities like Gwalior, Jhansi etc., it is comparatively easy to discover and contain the poachers from Shivpuri. A large number of wild animals and birds nearly of all species found in the District are noted in the National Park. The Sindh River and the large lakes attract a large variety of winter visitor birds.

A regular working plan was drafted for the National Park in 1954. Under this plan the park was given the status of a Forest Divisions in the charge of a Director and development measures were taken up.

According to the wild life census of 1979, returned a tiger, 3 leopards, 863 spotted deer, 370 *sambhars,* 623 blue bulls, 107 four-horned deer, 615 *chinkaras*, 15 black bucks, 21 bears, 903 wild pigs, 3 wild dogs and 102 *jackals* in the National Park.

(i) Karera Sanctuary:

An area of 202 sq. km. was declared as Great Indian Bustard Sanctuary in the year 1982. The area comprises of total 33 villages of Karera and Narwar tahsil. Initially the major emphasis of management of the sanctuary was conservation and protection of Great Indian Bustard (GIB) in the area. But due to rapid increase in population of cattle, the GIB had to migrate to the nearly Soorajpur Area. The protection given also helped the population of black bucks increase very fast. The rapid increase of black buck caused frequent crop raiding problems. This sanctuary also has the famous *Dihayla Rajpur Lake*. This lake attracts large number of rare variety of Migratory birds. If probably protected this lake can be a very important site for bird attraction.

Raghogarh is located at 24° 26` 39`` N 77° 11` 55`` E it has an average elevation of 448 meters.

The district of Guna is divided into 6 divisions from a topographical point of view. The Raghogarh Tehsil forms a part of the Sindh Valley and the wider part of the Malwa plateau. The valley and the open plateau together occupy the eastern part of the Raghogarh Tehsil.

Raghogarh town is situated on uneven ground, surrounded by hillocks (Raghogarh protected forest) from three sides. It is situated on semi arid geological formation. The strata found are – Hard Kopra at a depth of 6 feet. The rock formation is Deccan trap massive basalt ovarian by alluvial plain.

The drainage pattern of the area is generally towards north and northwest, because of higher elevation of hills in the south. The main River is Parvati, which is around 3 km outside the Municipal Limits. The other small rivers are Bandargarh and Chopet. The rivers because of their steep banks have not caused floods. On the banks of these river forests are thick and very deep ravines have been formed because of continued erosion.

5.9 Soil:

The soil of the district can broadly divided into 3 major groups.

a) Clay soil associated with moderately stone of shallow depth occurring in well-drained moderately sloping plateau formed by severe erosion.
b) Very shallow, well-drained loamy soils associated with stone on gently sloping plateau formed by severe erosion.
c) Moderately deep to deep fine soil developed in very gentle sloping and well drained areas.

5.10 Geomorphology:

Physiographically, the major part exhibits a region of low level plateau plain of extrusive origin with terrace / rocky bench and flood plain (including in filled river bed) along the course of the rivers. The other landforms are low structural plateau and structural plains of Proterozoic rocks. The maximum and minimum elevations are 561 and 324 m above MSL at 9 km south of Aron in southern part and 31 km south west of Paron in the north western part of the district respectively.

5.11 Basin and Sub-Basin:

The district lies in the Yamuna drainage system. It drains by the Parbati and Kuno rivers, which are the tributaries of River Chambal. The eastern part of the district is drain by the river Sindh. The general flow direction of all the rivers is towards north with low gradient.