

## **GEOHERITAGE SITES OF MP AND CHHATTISGARH AND THEIR PRESERVATION AND MANAGEMENT**

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**ABSTRACT** Geo heritage sites are very attractive Geologicalocations and have got the same heritage value as other monuments of historical value. The preservation of these sites as monuments of natural history is very important&economical as they are on the verge of extinction due to rampant developmental activities and urbanization. The government has taken various steps to conserve these geological monuments but still much is to be done as these locations are generally isolated and spread in vast areas. Therefore, preservation of these sites has become important to prevent them from deterioration and exploitation. This paper deals with these issues concerning geoheritage sites of Madhya Pradesh and Chhattisgarh and suggests a possible methodology for conservation and better management of them.

**Keywords**Madhya Pradesh and Chhattisgarh, Fossiliferous, Geo heritage, Conservation, Traps, Gondwana, Marine Fossils.

### **1. INTRODUCTION**

“Geoheritage” is a generic but descriptive term applied to sites or areas of geologic features with significant scientific, educational, cultural, or aesthetic value. Scientifically and educationally notable geoheritage sites include those with textbook geologic features and landscapes, distinctive rock or mineral types, unique or unusual fossils, or other geologic characteristics that are importantto education and research. Culturally, significant geoheritage sites are places where geologic features or landscapes played a role in cultural or historical events. Aesthetically, significant geoheritage sites include landscapes that are visually appealing because of their geologic features or processes. Many geoheritage sites can be tourist destinations and provide local and regional economic benefits. Geoheritage sites serve public interest. Such sites are critical to advancing knowledge about natural hazards, groundwater supply, soil processes, climate and environmental changes, evolution of life, mineral and energy supplies, and other aspects of the nature and history of the Earth. Such sites have high potential for scientific studies, use as outdoor classrooms, enhancing public understandingofscience, recreational use and economic support to local communities. Geoheritage sites in MADHYA PRADESH and Chhattisgarh are enclosure sites where geological formations or features of geological importance are existent.These sites can be fossiliferous, geological structures, mineralised zones, hot geysers,sulphur springs,etc. In order to ease the understanding of the above geo heritage sites, they are classified as fossiliferous localities, sulphur springs,geological structures,mineralised zones in Madhya Pradesh and Chhattisgarh.

**FOSSILIFEROUS LOCALITIES Chhotasimla and Barasimla**on the confluence of paat baba mandir near gun carriage factoryin Jabalpur which is an excellent location from where Gondwana plant fossils and fossils of dinosaurs and their nests and eggs

bare been discovered in past. The important plant fossils known to occur are gangamopterissp,cycads, gymnosperms, pine.



Figure 1. View of Bara Simla behind gun carriage factory at Jabalpur

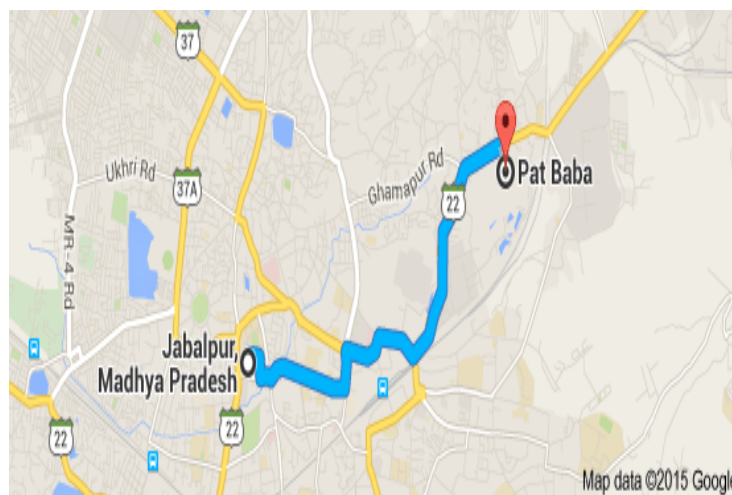


Figure 2 :Route map from of Jabalpur Railway station to Paat Baba

Ghugua Fossil ParkThe Ghughua/Ghughwa Fossil National Park in Dindori District of Madhya Pradesh is a unique destination in India. It has been blessed with priceless treasure of plant fossils which have been dated 65 million years old. It is believed to be of time Gondwana Supercontinent. It lies on tourist's route of Bandhavgarh to Kanha national park or vice versa. While travelling from Kanha to Bandhavgarh, or vice versa, tourists often take small halt here to visit Ghughua fossil Park. These fossils were founded in the year 1970 and Ghughua Fossil Park was declared as National Park in the year 1983. Here well preserved fossils of woody plants, climbers, leaves, flowers, fruits and seeds have been showcased with informative documentation. Dicotyledons and palm fossil woods are numerous. Such plants are not found in Central India. These fossils represent a period in the history of the Earth that is highly significant for the vegetational history of India.



Figure3: Entrance of Ghughwa Fossil Park

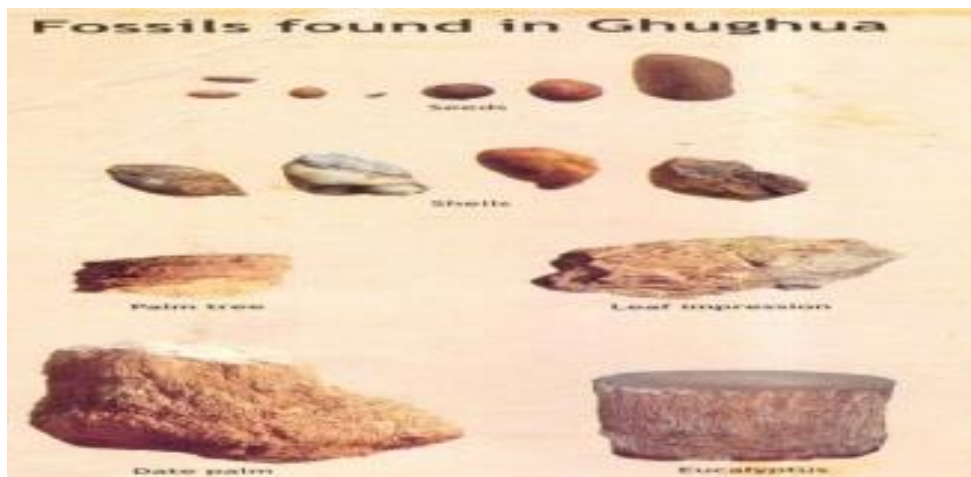


Figure 4 Fossils Found at Ghughwa

Besides these localities several other localities near deoridindori and approx. 20 km radius of Ghugua, These fossils are found. The fossil record of Ghughua consists of mainly plant fossils belonging to the topmost Cretaceous to Early Tertiary periods dating back to about 65 million years. So far, 31 genera belonging to 18 families have been identified. There is a preponderance of palms and dicotyledons. Fossils of eucalyptus trees, found here are native to Australia which indicate of time when Great Gondwana Supercontinent was existing. Other fossilized plant includes ancient date palm, **Jamun**, Banana, Rudraksh and Aonla. In addition, fossils of some molluscs have also been found which indicates that in past this region was much more humid and received more rainfall. Now a days, climate is totally different and arid.

**Fossiliferous Zone Near Umaria** Located between the Kanha and the Bandhavgarh national parks in the Mandla district, the site is rich in fossils, said to be around 60 million years old. These fossils have helped to unfold the mysteries of the

evolution process of plant kingdom and animals. Ghughva, the main site of the fossil park is about 6.84 acres in extent along with three other associated sites Umaria-Silther (23.02 acres), DeoriKhurd (16.53 acres) and Barbaspur (21.35 acres). They are very rich in large fossil trunks, fossil fruits and a variety of quartz stones. Fossils of Hyphaene seen in Ghughva-a variety of still living in the African continent, further suggests that once India was a part of the African continent. Four km away from Ghughva,near the village Umaria, a good number of fossils are also seen at Umaria- Silther. At Deori-Khurd (9km from Shahpura) and Barbaspur (2 km from Manikpur) site fossilized trunks are seen in erect position. In Mandla district, many sites of the fossils are found and most of the paleobotanical antiquated relics belonging to the Deccan intertrappean series. Fossils have always facilitated the scientific understanding of our old flora and fauna.



*Figure.5.Fossils at Umaria.*

### **Marine Gondwana Fossil Park**

Marine Gondwana Fossil Park at Manendragarh, Sarguja district, Chattisgarh is an unique exposure of fossiliferous marine Permian (240-280 Ma) rocks of the Talchir Formation belonging to Gondwana Super Group. It is exposed for a length of about one km upstream to the confluence of Hasdeo River and Hasianala nearvillage Amakherwa on Manendragarh – Amakherwa coal mines road near the railway bridge on the Hasdeo river. The marine fauna is represented by the dominance of pelecypods/lamellibranchs like Eurydesma and Aviculopecten within shale along with Bryozoans.



Figure6 (a & b) : View of the location of marine Gondwana fossils near Amakherwa.

Crinodal stems and Bryozoans are numerous in these rocks. The stretch of fossiliferous strata is approximately 1 km on the upstream of the river Hasdeo and not properly guarded though exposed at many places. The fence erected by the forest department is broken and deteriorated.

**Algal Stromatolites near Maihar** and at various localities of Kaimur stone sand and near Rewa are well known and documented and lot of studies and literature is available. Various fossils of algae are found in abundance.

**Fossils of Baghbeds** Numerous remains of dinosaurs their eggs and bones and fossil molluscs have been reported to occur in nimar sand stone and are very well documented.

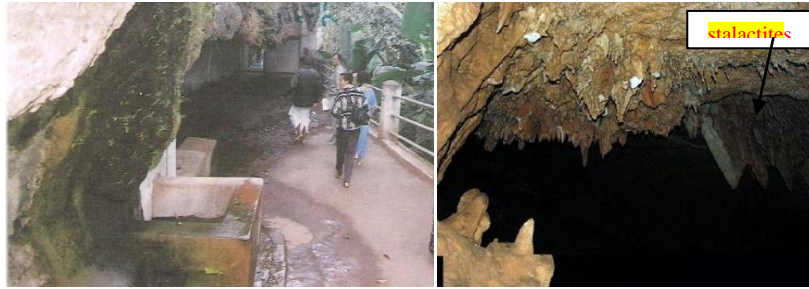


Figure.8. Bagh beds near Dhar

### **Geomorphological Structures**

Limestone caves exist near Jashpur in Chhattisgarh (Kailash Gupha Caves and khuriarani

ki gupha) and kutumsar and dandak caves near Jagdalpur.



*Figure9 (a & b) Kailash gupha cave near Gashpur in Chhattisgarh*

Granite dykes sills and other igneous structures are found in granite near Jabalpur



*Figure11 Granites near Madan Mahal, Jabalpur*

(i) Folds and faults in metamorphs can be seen at Lametaghat in micaceous schists and as well as Bheraghat, Hasdeo valley and Nimar sand stone and near Maihar.



**f** *Figure12. (T) Folded rocks near Lamheta Ghat Jabalpur.*



Fig 13(B) folded rocks near has deo river near manendragarh.

Remains of Gondwana volcanism can be seen near Sihora and traps near Tilwaraghat near Jabalpur.

(ii) Bundelkhand granite at Orchha in the Bundelkhand Craton is composed of Palaeo-Proterozoic granitic batholith with slivers and narrow belts and rafts of older supra-crustal rocks which range in age from 2.5 to 3.2 Ga. It is composed of various granitic phases ranging in composition from tonalite- trondjemite-granodiorite (TTG) suite of granite sensu-stricto. The grain size is also variable from fine to coarse grained. These phases are emplaced during early, syn, late to post tectonic periods. The tectonic signatures are preserved in the form of textural characteristics of these phases. Megascopally, the rock is granular, pink coloured biotite granite (similar to the main granitic phases of the Bundelkhand Gneissic Complex). It consists of orthoclase, perthite, quartz, oligoclase and some biotite as the major constituent minerals. The orbicules vary in size between 5cm and 22cms and are highly rounded in shape. They are pink in colour, with or without a core in the centre and also with or without rim between centre and core. They are mainly proto or single shelled these are the oldest rocks in the region



Figure 14 Bundelkhand granite near Orchha

**(Tata Pani Hot Springs)** Near Kunkuri in Chhattisgarh is an attractive hotwater spring, well known for its medicinal properties, alkaline in nature (7.9 to 8.9 pH) primarily, containing helium, carbon dioxide, oxygen and nitrogen.



Figure 15 Tatta Pani spring which has water temperature up to 50 to 60 Degrees.

### **Geomorphological Wonders**

(a) **Chitrakoot Falls Jagdalpur** The geological formation of the Indravati River valley as it rises and flows downstream consists of [quartzitic sandstone](#) and changes to the [Archaean granite](#) and [gneisses](#) near the Chitrakoot Falls. It is one of the six waterfalls in India which is classified as a geomorphosite/[geoheritage](#) site.

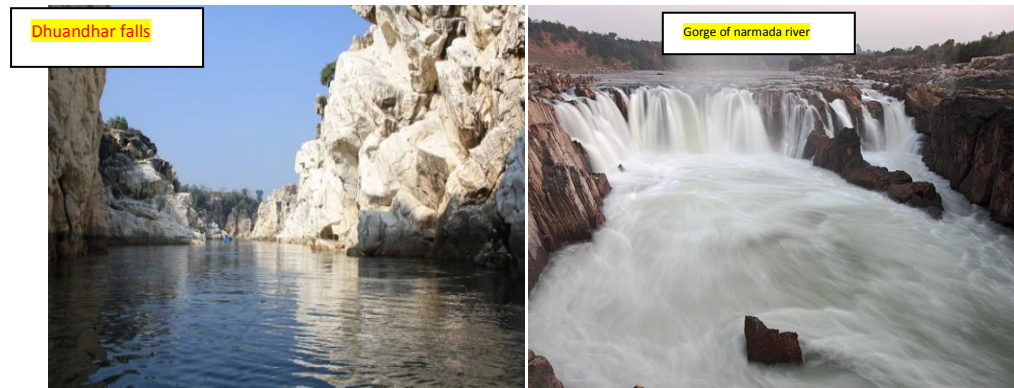


Figure. 16. (a) Chitrakoot falls near Jagdalpur

(b) **Dhuandhar Falls on Narmada River** The Dhuandhar waterfalls near Jabalpur is an extraordinary geomorphological feature, here the Narmada river travels in the deep gorge flanked by marble and talc cliffs which resembles a moon river crossing the deep gorge. The waterfall is very beautiful and serene as the water gushes down from nearly 10 to 12 m, the force of water is such that the water produces tiny droplets produce smoke like effect hence the name Dhuandhar.

(c) **Amritdhara Water Falls on Hasdeo River Near Manendragarh** The Amritdhara waterfalls represents an untouched geomorphological wonder in which the river falls from a height of 30 to 35 m the resulting morphology and dense vegetation makes it akin to a waterfall of prehistoric times.





*Figure. 16 (b&c) Dhuandhar falls and Narmada reiver near Jabalpur*



*Figure. 16 (c) Amritdhara falls*

#### THE FOLLOWING THREATS ARE ENVISAGED –

Rampant mining for building stones, lime stones and other earth resources are destroying the geo heritage sites like for example lime stone mining near Rewa and Maihar is eventually destroying the stromatolites and likewise near dhar for sand stone is destroying the Dinosaurian remains.

Urbanisation and economic activity has put lot of pressure on the geo heritage sites.

Non protection of these sites keeping them open for poachers and fossil sellers made these sites areas of unscrupulous activities.

Deforestation and lack of awareness to protect these sites have made them neglected.

#### **SUGGESTED MEASURES FOR PRESERVATION BETTER MANAGEMENT OF GEO HERITAGE SITES IN MP AND CHHATTISGARH**

Some suggested measures are as under :-

i) Keeping the mining and other development activities restricted so as to protect these sites by giving certain areas the status of National geological monument and imposing stringent penalties to defaulters.

ii) Educating local populace regarding importance of these sites one way is to train them as geo heritage guides and certifying them to conduct visitors for a nominal fee this can be taken over by the GSI or Deptt of mines and Geology of the concerned states.

- (iii) Erecting permanent barriers to protect unprotected zones and making them accessible only to the bonafide visitors.
- (iv) School children can be taken on tours and excursions to these sites nearby so that they understand the importance.
- (v) Raising a Geo heritage protection wing inside GSI and empowering with constitutional powers so that they can effectively manage the Geo Heritage sites.
- (vi) Allow Geo tourism to prosper by introducing it as a subject of studies in all tourism and travel management courses.
- (vii) Mass publicity both by print and visual media the importance of preserving these important natural monuments of the earth's history.
- (viii) Encourage tour operators to organise conducted tours to these Geo heritage sites under the aegis of GSI/Deptt of Science and Technology.
- (ix) Incentives to novices and explorers will also instill sense of achievements for protecting these sites.
- (x) No environmental clearance be given to any project without consulting GSI, ForestDeptt and expert Geologists of the country.
- (xi) Synergy between Government agencies and involving community participation for preservation of the geoheritage sites.

## 2. CONCLUSION

Geo heritage sites are equally important as monuments of earth's natural history and if we lose them we have lost one chapter the earth's history and a well said quote says that the past is the key to the present and if we do not understand the planet earth we are asking for trouble like quakes earth, tsunamis, volcanic eruptions, climate change, global warming, etc. Therefore, it becomes important that we understand the importance of earth's geological history and the catastrophes so that we can hand over a better planet to our future generations.

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