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Untapped Potential of Geotourism in Rewa Region, Central India

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Abstract: **Geotourism has linkage with other forms of tourism. These include cultural tourism, ecotourism and adventure tourism. The Rewa area in central India has tremendous untapped potential of geotourism in and around various geo-sites. Such geo-sites include several waterfalls, which have catching landscapes and gorgeous scenic beauty. Further, they provide enormous scope for learning geological and geomorphological processes that were responsible for the origin of waterfalls in a row. To this, we may also add cultural tourism, ecotourism and adventure geotourism. For sustainable geotourism and development, proper development of geo-sites (waterfalls) by improving connectivity and development of onsite infrastructure are needed. These would go a long way in improving economy of the local people and thereby social upliftment of the area. In this context, IRCTC Tourism department can play a pivotal role in creating new development projects in and around all the geo-sites (waterfalls) in the Rewa area. Increased research and development activities should be taken up to explore the area. In such projects local people should invariably be involved for sustainable geotourism and development.**

Index Terms: **Geotourism, Madhya Pradesh, Rewa region, Sustainable development, Vindhyan Supergroup, Waterfalls.**

1. INTRODUCTION

The word geotourism is rather a fairly new concept. It focuses on geology and landscape of any area with a view of sustainable development of tourism (Dowling, 2013). It encourages tourism to geo-sites and also involves understanding of abiotic-, biotic- and cultural-environments. In fact, geotourism is a broad idea that includes several aspects of tourism activities, namely, transport, boarding and lodging, onsite amenities, recreation, planning and management (Olafsdottir, 2019). There is a fast-growing geotourism all over the world. It is brought out by the increase in membership of the UNESCO Global Geoparks Network, commencing from 20 geoparks in the year of its formation in 2004 to 140 in 2018 (Global Geopark Network). In this article neglected geotourism potential of Rewa region in central India is highlighted.

II. BRIEF GEOLOGY

The Rewa area exposes Proterozoic sedimentary rocks of the Vindhyan Supergroup (Singh and Dubey, 1990). The prominent litho-units are represented by Bhander limestone, Ganurgarh shale and sandstones of the Rewa and Kaimur Groups (Upper Vindhyans). The Rewa Group (2000 m thick succession of red shale and sandstone beds) is separated from the underlying succession of the Kaimur Group. The stratigraphic succession of the Rewa area is presented in Table 1. Brief details of main geologic units are given below.

Table 1. Geological succession of the Rewa area (Modified after Singh and Dubey, 1990)

Period	Formation	Lithology	Thickness (m)
Recent	Alluvial Soil	Alluvial silt with fine sandy clay and kankar with laterite	Up to 5
Proterozoic (Bhander Group)	Sirbu Shale	Calcareous, algal-stromatolitic below; sandy shale above	5
	Bhander Limestone	Massive, grey to pinkish, micritic limestone	25
	Ganurgarh Shale	Thinly laminated, pinkish to red, soft shale	25
(Rewa Group)	Upper Rewa Sandstone	Reddish-brown to white, thick-bedded to massive sandstone	—

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A. Upper Rewa Sandstone

The Upper Rewa Sandstone forms straight or slightly curved hill ranges in the Govindgarh and Sohagighat section. It occurs as extensive sheet like bodies in the Chachai and adjoining areas. This sandstone lies over the Rewa shale in Sohagighat section. It is further separated by a thin, locally developed, intraformational conglomerate. The upper part of the Rewa shale becomes sandy and eventually grades into a red coloured Rewa sandstone. In general, the Rewa sandstone sequence is reddish brown, purple and white coloured and is thick bedded, slabby to massive. It consists of winnowed clean, rounded to sub-rounded quartz grains. The Rewa sandstone grades upward into the Ganurgarh shale, which forms the basal formation of the Bhander Group.

B. Ganurgarh Shale

The Rewa sandstone grades upward into the Ganurgarh shale by a gradual increase in the fine-grained material and a decrease in the sand-size particles. It covers large area in Rewa region. At various places, it is soil covered. The shale is thinly laminated, well bedded and splits along the bedding planes. It shows gentle dip towards northwest direction. The shale is pinkish to red in colour and soft in nature. It comprises white coloured band of mudstones with intercalated lenses of silty sandstone.

C. Bhander Limestone

The Bhander limestone occupies the western part of the area. It covers an area of about 330 sq km. The Bhander limestone overlies the Ganurgarh shale and underlies the lower Bhander sandstone. The limestone is best exposed around Rewa, Bankuiyan, Ramnai and the University area. It is massive and grey in colour. The limestone of university area is in different

D. Sirbu Shale

The Sirbu shale sequence is about 5 meter thick. It is present only in a hillock near Bela. Its lower part is calcareous and shows algal stromatolites. The upper part is rather sandy shale with frequent intercalations of thick and thin sand layers.

III. GEOTOURISM POTENTIAL

As outlined above, the Rewa region in central India exposes different types of litho-units. Due to their own characteristic lithological features, they are endowed with different types of landscapes. Carbonate rocks being susceptible to solutioning are store house of both surface and sub-surface attractive landscapes (Singh, 1989, 1992; Singh and Dubey, 1998). Shales being soft form low lying areas and valleys. Sandstones are hard and quartzitic. They form hill ranges, cuestas, ridges, tablelands and sheet-like bodies. Brief details of majestic waterfalls located in sandstone terrains (Fig. 1) are highlighted below. These waterfalls are centre of attraction for geotourism.

Fig. 1. Google image with locations of prominent geo-sites in Rewa region, central India. Locality: 1. Purwa waterfall; 2. Chachai waterfall; 3. Keoti waterfall; 4. Bahuti waterfall; and 5. Belauhi waterfall.

Table 2. Details of prominent geo-sites (waterfalls) in the Rewa region, central India

Loc. No.	Waterfall	Coordinates	River	Height (m)	Main control
1	Purwa	24.783°N; 81.265°E	Tons River	70	Break in river slope and joint
2	Chachai	24°47′31″N; 81°18′10″E	Beehar River	130	Break in river slope and joint
3	Keoti	24°48′58″N; 81°27′11″E	Mahana River	98	Break in river slope and joint
4	Bahuti	24°45′36″N; 81°49′45″E	Sellar River	198	Break in river slope and joint
5	Belauhi	24°47′08″N; 81°58′16″E	Gorma River	90	Break in river slope and joint

A. Purwa Waterfall

The Purwa waterfall is about 25 km from Rewa town. The waterfall formed in Tons River, when river descends from the Rewa plateau (Fig. 2, 3). The Tons River is 5th order stream (Singh and Bhatt, 1996). The Purwa waterfall (Fig. 2, 3) represents a nick point, which appears to have developed by rejuvenation (cf. Crosby and Whipple, 2006). Basically, a nick point is break in river gradient making water to fall vertically leading to waterfall.

Fig. 2. Post-monsoon flow in Purwa Waterfall. Note sheet-like sandstone bodies in top and longitudinal section.

Fig. 3. A panoramic view of the Purwa waterfall. Note strongly-jointed sheet-like sandstone bodies.

B. Chachai Waterfall

The Beehar river, a tributary of Tons River, forms Chachai waterfall (Fig. 4). It is about 30 km away from Rewa city. It is the second highest waterfall in Madhya Pradesh, and is considered highest single-drop waterfalls (rewa.nic.in). Furthermore, it is the 23rd highest waterfall in India.

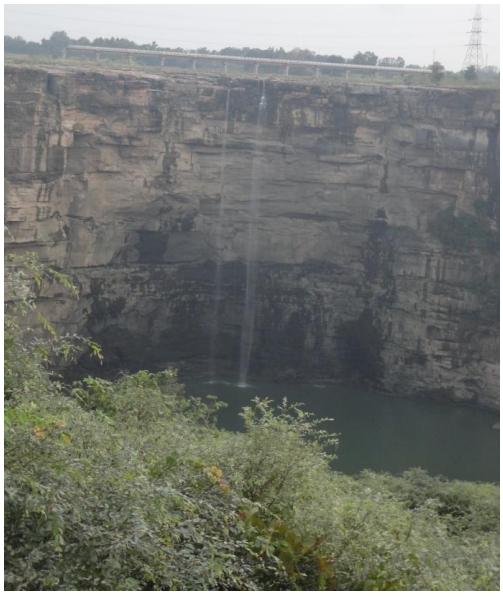

Fig. 4. A view of Chachai waterfall during post-monsoon.

C. Keoti Waterfall

The Keoti waterfall (Fig. 5, 6) is located about 40 km away from Rewa town. It is 24th highest waterfall in India, and is one of the top five waterfalls in Rewa district. It has unique topography. It is located in Mahana River that is a tributary to Tons River. The view from the waterfall is very attractive during the sunrise and sunset. Dilapidated Keoti fort (Fig. 7) is located adjacent to waterfall. The fort was built taking advantage of the natural obstacles for safety purposes.

Fig. 5. A view of Keoti waterfall. Reduced waterflow is apparent.

Fig. 6. Water moving away after falling in floor of Keoti waterfall.

Fig. 7. Dilapidated Keoti Fort constructed taking advantage of natural obstacles for safety. Note use of local geological rocks for construction of fort.

D. Bahuti Waterfall

The Sellar River makes Bahuti waterfall (Fig. 8) as it flows down the edge of the valley of Mauganj. The Sellar River is a tributary of Tons River. The vertical fall of the water in this waterfall is the highest (198 m) in Madhya Pradesh. During rainy season it is scenic and majestic. The river course is governed by joint. It is located at a distance of about 70 km.

Fig. 8. A view of Bahuti waterfall with reduced waterflow.

E. Belauhi Waterfall

The Belauhi waterfall (Fig. 9) is located in Gorma River, in which a dam is constructed and named after it. The flow of Belauhi waterfall (Fig. 9) is largely regulated by spillway water discharged from the Gorma dam. Accordingly, water flow is more during rainy season, which gradually reduces with the passage of monsoon. Another feature around this waterfall is the presence of about two-and-a-half-dozen bird species making it attractive for ecotourism also, besides geotourism.

Fig. 9. A view Belauhi waterfall (Credit: Google; uploaded by Nihal).

IV. DISCUSSION

A. Origin of Waterfalls

A critical examination of nature of all the waterfalls reveals that they represent a nick point, a feature that may develop by rejuvenation (Crosby and Whipple, 2006). The nick point (or merely nick) basically represents abrupt breaks in river gradient or change in slope in the longitudinal profile in a river. Accordingly, the break in river gradients made water to fall vertically leading to development of waterfalls in the Rewa region (Fig. 1, 2, 3, 4, 5, 6, 8, 9). Accentuated river erosion, coupled with removal of blocks, along the prominent joint planes seem to be the main reasons for the origin of picturesque waterfalls in the Rewa region. Another reason for the origin of waterfalls may also be the headward erosion of the stream channels.

B. Geotourism Potential

Geotourism has linkage with other forms of tourism, e.g., cultural tourism, ecotourism and adventure tourism (Dowling, 2013). Basically, geotourism involves geological and geomorphological aspects of landscapes. These attract tourist that is the fastest growing market in tourism (Olafsdottir and Tverijonaite, 2014, 2018; Dowling and Newsome, 2018; Olafsdottir, 2019). The Rewa area in central India has tremendous untapped potential of geotourism in and around various geo-sites. Such geo-sites include several waterfalls, which have catching landscapes and gorgeous scenic beauty. Further, they provide enormous scope for learning geological and geomorphological processes that were responsible for the origin of waterfalls in a row (Fig. 1). To this we may also add cultural tourism, wherein geotourist would get opportunity to know use of geological materials for the benefits of society and sculptures in rock (Fig. 7). Geo-sites would also provide insights on how natural obstacles have been used for defence and safety in the past for building fort (Fig. 7). Scope of adventure geotourism need not be emphasised in the backdrop of enough potentials for getting down to deep gorges, river valleys, and rock climbing and a few sporting activities (Fig. 2 to 7). Ecotourism may involve study of geologic controls of plant and animal distribution.

C. Sustainable Geotourism and Development

The concept of sustainability can be traced back to the early 20th century during the period of industrial revolution, involving two contrasting groups in the environmental movement, e.g., the conservationists and the preservationists. In fact, it is possible to achieve targets of development in one side. On the other side, continuity in availability of natural resources and ecosystem services can also be maintained simultaneously. These would support the economy and growth of society. Further, they are the keywords for sustainable geotourism and development. The three mutually dependent and strengthening aspects are economic- and social-development and environmental protection. In light of these points, prominent waterfalls of the Rewa region (Fig. 1, 2, 3, 4, 5, 6, 8 and 9) can play a significant role in sustainable

geotourism and development. Proper development of waterfalls by improving connectivity and development of onsite infrastructure would go a long way in improving economy of local people and thereby social upliftment of the area; as improved accessibility will boost tourism industry (Csagoly et al. 2016; Tverijonaite et al. 2018; Haraldsson et al. 2018). In this context, IRCTC Tourism department can play a pivotal role in creating new development projects in and around all the waterfalls in the Rewa area. Integrated research and development activities should be taken up to explore geological, geographical, geomorphological and geotourism aspects of the area. These can be done with a view to passing benefits to local people. In such projects local people should invariably be involved, which will lead to sustainable geotourism and development.

CONCLUSION

The Rewa region of central India, underlain by the Proterozoic sedimentary sequence of the Vindhyan Supergroup, hosts a cluster of five prominent waterfalls – Purwa, Chachai, Keoti, Bahuti and Belauhi – that together constitute a largely untapped geotourism resource. Each waterfall marks a nick point developed along joint-controlled breaks in river gradient within the resistant Upper Rewa Sandstone, so that their origin, morphology and scenic character are directly rooted in the local structural and lithological setting. Beyond their intrinsic geological interest, these geo-sites carry strong potential for allied forms of tourism: cultural tourism through heritage structures such as the Keoti fort, ecotourism through the bird diversity around Belauhi, and adventure tourism through gorge- and valley-based activities at several of the falls.

Realising this potential requires deliberate intervention. Improved road connectivity, basic onsite infrastructure and visitor amenities at each waterfall would markedly enhance accessibility and visitor experience, and in turn generate livelihood opportunities and social upliftment for local communities. Coordinated action by agencies such as the IRCTC Tourism department, supported by sustained geological, geomorphological and geotourism research, is needed to translate this potential into planned development. Critically, any such development must keep local people as active stakeholders rather than passive beneficiaries, so that economic gains, environmental protection and social development advance together. On this basis, the Rewa region can emerge as a model for sustainable geotourism in central India, and the approach outlined here for its waterfalls offers a template that may be extended to other under-documented geo-sites across the Vindhyan basin.

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REFERENCES

Crosby, B.T. and Whipple, K.X. (2006) Knick point initiation and distribution within fluvial networks: 236 waterfalls in the Waipaoa River, North Island, New Zealand. Geomorphology, v. 82, (1-2), pp. 16-38.

Csagoly, Z., Saporsdottir, A.D. and Olafsdottir, R. (2016) Tourism changing the edge of the wild. J. Outdoor Recreat. Tour., v. 17, pp. 1-8.

Dowling, R. (2013) Global geotourism – an emerging form of sustainable tourism. Chech Journal of Tourism, v. 2, No. 2, pp. 59-79. DOI: 10.2478/cjot-2013-0004.

Dowling, R. and Newsome, D. (Eds.) (2018) Handbook of Geotourism. Edward Elgar Publishing, Cheltenham, UK.

Haraldsson, H.V. and Olafsdottir, R. (2018) Evolution of tourism in natural destinations and dynamic sustainable thresholds over time. Sustainability, v. 10, pp. 4788.

Olafsdottir, R. and Dowling, R. (2014) Geotourism and geoparks – a tool for geoconservation and rural development in vulnerable Arctic environments. A case study from Iceland. Geoheritage, v. 6, pp. 71-87.

Olafsdottir, R. and Tverijonaite, E. (2018) Geotourism: a systematic literature review. Geosciences, v. 8, pp. 234.

Olafsdottir, R. (2019) Geotourism (Editorial). Geosciences, v. 9, pp. 48, doi:10.3390/geosciences9010048.

Singh, Y. (1989) Sinkholes (dolines) in Bhander limestones around Rewa, central India and their environmental significance. In: Beck, B.F. (Ed.), Engineering and Environmental Impacts of Sinkholes and Karst. A.A. Balkema Publisher, Rotterdam, pp. 47-52.

Singh, Y. and Dubey, D.P. (1990) The stratigraphy and depositional environments of the Vindhyan sediments in Rewa area, Madhya Pradesh. Geol. Surv. India, Spl. Publ. No. 28, pp. 354-368.

Singh, Y. (1992) Study on the cave passages in Precambrian Bhander limestone of the Vindhyan Supergroup, India. Z. Geomorph. N.F., Suppl.-Bd.85, Berlin, Stuttgart, pp. 115-126.

Singh, Y. and Bhatt, A.K. (1996) A study on the drainage of the area around Rewa district, Madhya Pradesh and its hydrogeological significance. In: Rajamanickam, G.V. & Varma, O.P. (Eds.), Proc. 9th Convention of Indian Geological Congress & National Seminar on Acquisition of Modern Techniques for the Development of Geosciences, Thanjavur, pp. 271-276.

Singh, Y. and Dubey, D.P. (1998) Grikes in Bhander limestone sequence of Rewa area, central India. Indian Jour. Geomorphology, v. 3, No. 1, pp. 95-106.

Tverijonaite, E., Olafsdottir, R. and Porsteinsson, P. (2018) Accessibility of protected areas and visitor behaviour. J. Outdoor Recreat. Tour., v. 24, pp. 1-10.