

GeoArt in the Indian context

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GeoArt is a subject dealing *sensu-stricto* with the earth's landforms in an artistic manner. Peng¹ defined it as a 'study and appreciation of the beauty that is found in the landforms, rocks, minerals and fossils of the earth', and included features irrespective of scale. Muda² also mentioned a wide range of scales for the geological or natural arts (geoarts) for public awareness and geotourism.

Literally the word 'GeoArt' contains 'geo' for earth (for creations of Nature) and 'art' (human appreciation). Thus, it is a merger of both scientific and aesthetic aspects. Attractive artistic formations due to appearance, textural style and mosaics of vivid colours of natural landforms, water bodies and their banks, glaciers, forests and snow-clad zones, etc. constitute GeoArt.

The term is also used differently in some other pursuits. Baucon and Carvalho³ considered the natural beauty of geological features in actual artwork (drawings), naming them as 'Geoart'. Golanska⁴ used the earth views/images as the background of his artwork and brought them under the category of 'Geoart'. According to Huntley⁵, Geological Survey of Canada under the project 'Geoart' aims to increase awareness in society of the natural landscapes through geoscience and art. The Centre for Education and Research in Geosciences (CERG), Pune, Maharashtra, India, organizes art competitions in the country on Earth Science themes under 'Geoart'. The term 'Geoart' is also used for artworks created on the globe (Google Earth) through 'Geocaching' as part of location based treasure hunt. The aim is to set up caches (location points in artistic views when joined together) by anyone anywhere on the globe, sharing all the coordinates on the internet. With the help of GPS one can locate these caches on the ground and get rewarded. However, this does not fall under the present context of GeoArt.

The concept of perceiving Geoart from the sky space, however, came into prominence with the publication of a book titled 'Earth as Art'⁶ by NASA. This book has stunning images of earth surfaces and landforms taken by satellites since 1960. The images were intended to be viewed for amusement rather than scientific interpretation. The human eye perceives radiation within a limited range (visible light seg-

ment) of the electromagnetic spectrum. The satellite sensors register visible, infrared and other segments of the spectrum and hence provide more information. Minute details of the landforms thus emerge better in satellite images. This may highlight the landform artworks created by Nature. Eye of Sahara, Lena Delta, Ribbon Lakes, Tibetan Plateau, Zagros Mountains, etc. are some of the appealing examples of GeoArt. Being of large in size, these spectacular landforms cannot be appreciated well on the ground.

Tectonic plate movements create major landforms on the earth, which get modified continuously by denudational agencies. Due to prolonged physical, chemical and biological weathering, mountains, hills, plateaus and plains of varying sizes are developed. From the geoscience point of view, such landforms and landscapes are grouped as 'geosites' when displaying geological features, and as 'geomorphosites' when they exhibit geomorphic features or processes. In India, Kale⁷, and Vaidyanathan and Subba Rao⁸ have identified several interesting geosites and geomorphosites, some of which are declared as National Geological Monuments by the Geological Survey of India⁹. Some are under consideration for Geoheritage sites, e.g. Rann of Kachchh, badlands of Chambal, Thar Desert, Deccan Volcanic Province, Great Boundary Fault, Naga Hills Ophiolite, Angadipuram Laterite, Peninsular Gneiss, Vishakhapatnam Natural Arch, Sendra Granite, and a few fossil and mineral-related sites. These vary significantly in dimension.

From GeoArt point of view in India, except for the Lonar Lake, identification of landforms and landscapes displaying curious or spectacular artworks of aesthetic sense from the sky-space is not available. The present author recently came across some amazing GeoArts located in different parts of India, while surfing the Google Earth Pro imageries. These are of different sizes and have unique shapes, i.e. humanoid, animal, bird, heart, religious symbol or related to human or divine activity, etc. He has also published articles on GeoArt¹⁰⁻¹². Some examples of GeoArt identified from the Indian territory are described below.

(i) *J-shaped hill*: The horizontally bedded sandstones of Kaimur Group of the Vindhyan Supergroup¹³ have developed into a unique 2.6 × 2.0 km, *J* shaped hill.

This has developed through weathering and scarp-retreat facilitated by fractures (Figure 1 *a*). This GeoArt is created by Nature at about 55 km northwest of the Dhala meteorite crater in the Shivpuri district of Madhya Pradesh.

(ii) *Dinosaur-like hill*: This is a beautiful GeoArt developed by denudation of Charnockite rocks of Archaean–Paleoproterozoic age¹⁴. The shape of the hill is in the form of a reddish-brown dinosaur (1400 × 300 m linear hill). It is sighted in the northwestern part between RR Nagar and Fraserpeta in the Vijayawada city, Krishna district, Andhra Pradesh (Figure 1 *b*). It has evolved through prolonged weathering and town expansion.

(iii) *Heart-shaped rock*: The quartzites of Kurnool Group (Neo-Proterozoic¹⁴) are seen forming an eye-catching GeoArt displaying the shape of a beautiful human heart. It is 700 × 1000 m in size and located in Cuddapah basin at about 800 m north of Yaganti in Kurnool district, AP (Figure 1 *c*). It is developed by weathering of sub-horizontal strata having multi-directional fractures and scarp failure due to the presence of softer rocks below.

(iv) *Humanoid family*: An amazing GeoArt displaying some humanoid forms is seen over 1.6 km span on the left bank of Tungabhadra Dam, 3 km southeast of Kaa-tarki in the Koppal district of Karnataka (Figure 1 *d*). It is developed by submergence of irregular bank and interaction of water with rocks belonging to Peninsular Gneissic Complex of Archaean age.

(v) *Lady humanoid*: An attractive GeoArt showing an alien-like lady in sitting posture (head size 450 × 300 m) is sighted on the right bank of River Krishna (Figure 1 *e*). It is developed due to partial submergence of Meso-Proterozoic Srisailam quartzites of Nallamalai Group of the Cuddapah Supergroup in the Srisailam reservoir¹⁴. This feature is located 7 km southwest of Srisailam town in the Kurnool district of AP.

(vi) *Tribal face*: A beautiful GeoArt displaying a humanoid face (1 × 1 km in size) similar to a tribal person is seen developed by weathering of horizontally disposed Deccan Trap flows on the low escarpment which is cultivated in patches (Figure 1 *f*). It is found near Mainpuri about 13 km southwest of the district headquarters of Dindori in MP.

(vii) *Bird-shaped palaeochannel*: A curious GeoArt displaying a bird is sighted between Talliguri and Maruganj, about 8 km east of the district headquarters of Cooch Bihar in West Bengal (Figure 1 g). It is developed by old channels of a small tributary of River Kaljani, which joins the mighty River Torsha near Deocharai.

(viii) *Lonar lake*: This forms a unique GeoArt showing a circular lake. The lake has been formed by a high-velocity meteorite impact in the Deccan basalt plateau near Lonar in Buldhana district, Maharashtra. The Lonar lake is 1.8 km in diameter, filled with saline water and forms a Ram-

sar protected site (Figure 1 h). The lake is referred to many sacred Hindu texts¹⁵. It is now established as a popular tourist site.

These GeoArts exemplify amusing and spectacular landforms as seen from the Google Earth images. It was difficult to perceive them on the ground owing to their larger size. It is hoped that the fascinating images reported here may motivate both geoscientists and art enthusiasts to identify many more forms developed in the Indian territory. Like other landforms and landscapes, the GeoArts too have potentiality to present scientific perceptions of their development through natural and anthro-

pogenic procedures. Development stages of those GeoArts, which have been created recently (lakes/frozen lakes and their banks, islands, glaciers, river channels, farmlands, town expansion, mining, etc.) may be viewed through the 'Time Slider' of Google Earth, which provide earlier images. Google images however, cannot show the stages of development of rocky GeoArts. Humanoid Family (Figure 1 d) and Lady Humanoid (Figure 1 e) show their development in relation to reservoir water levels. It is hoped that accessible GeoArts such as *J*-shaped Hill, Heart-shaped Rock, Lady Humanoid, etc. will find their place, similar to Lonar Lake, in the future geotourism of India.

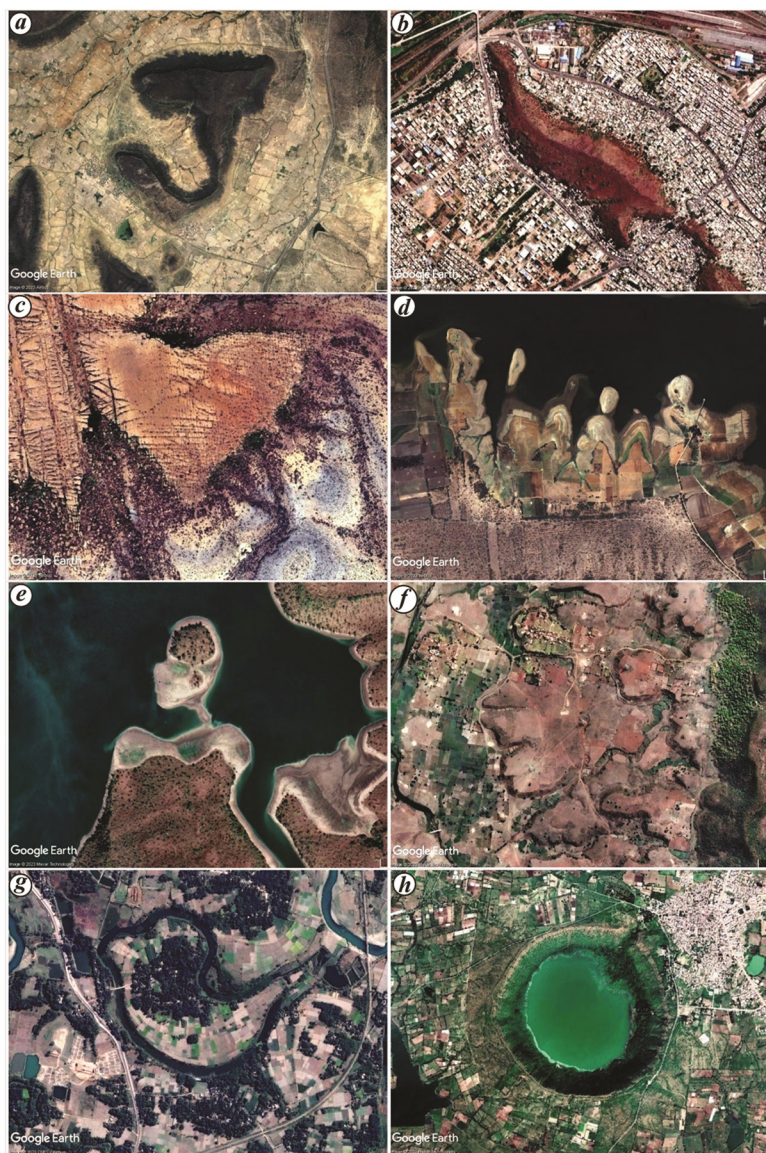


Figure 1. Examples of GeoArt from India. **a**, *J*-shaped hill, Shivpuri district, Madhya Pradesh. **b**, Dinosaur ridge, Krishna district, Andhra Pradesh. **c**, Heart-shaped rock, Kurnool district, AP. **d**, Humanoid family, Koppal district, Karnataka. **e**, Lady humanoid, Kurnool district, AP. **f**, Tribal face, Dindori district, MP. **g**, Bird-shaped palaeochannel, Cooch Bihar district, West Bengal. **h**, Lonar lake, Buldhana district, Maharashtra. (Note: All figures are enlarged parts of Google Earth images.)

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