

GEOLOGY OF JHARKHAND

Jharkhand is known for its diversified geological set up. The whole of Singhbhum region specially is considered as a natural geological museum. Geologically, Jharkhand consists of different types of rock formations ranging from Pre-Cambrian to Cenozoic era.

A number of eminent Geoscientists have contributed significantly in exploring the geology of Jharkhand. H. W. Voysey, Lieut. Tickells, Col. J. C. Haudhton, Emil Stoehrer and V. Ball were amongst the earliest workers to have worked in the region between 1844-1868.

H. C Jones (1918-1932), J. A. Dunn (1940) and Dunn and Day (1942) were the pioneer workers who had done the regional geological mapping of Singhbhum and surrounding region. Detail geological work in the region was done by Holmes, Sarkar and Saha.

The Older Metamorphics of Singhbhum region is believed to be the oldest rock exposed in the state which, invaded by biotite tonalite gneiss form the Archean basement for the Iron Ore Series to be deposited. The end of Iron Ore Orogeny was marked by intrusion of Singhbhum Granite, polyphase deformation and metamorphism in the Northern Singhbhum. This phase of polyphase deformation, metamorphism and igneous intrusion culminated in upliftment of the Precambrian rocks of the state. This resulted in to development of a stable and cratonized Precambrian terrain.

Prolonged erosion and denudation resulted in formation of Singhbhum groups of rocks (Chaibasa and Dalbhum formations). These rocks underwent first generation of folding, upliftment and subaerial erosion leading to regional tension and eruption of Dalma and Dhanjori lava along with concurrent deposition of terrigenous sediments. A second phase of folding continued and emplacement of granitic rocks commenced followed by a prolonged period of denudation and sedimentation. The Kolhan Group and the Vindhyan Group are such examples in South Singhbhum and in Garhwa districts respectively. The kolhan group was deposited over the basement comprising of Iron ore group and Singhbhum granite. At the end of the Palaeozoic era, i.e. towards the Upper Carboniferous a new series of changes took place manifested by gravity block faulting of the Chhotanagpur Granite Gneiss terrain. This resulted in development of a number of basins in which deposition of sediments in glacial condition (Talchir), fluvial and lacustrine conditions with intercalated plant remains (Damuda), flood plains and shallow lakes (Panchet) and arid condition (Mahadeva) took place. The post-Panchet and pre-Mahadeva period witnessed transverse faulting in the Gondwana basin. After this the crust of the earth is appeared to have experienced regional tension resulting in outpouring of vast quantity of basaltic lava and volcanic material forming Rajmahal Traps. After the Rajmahal period, the Jharkhand region did not experience any major geological activity.

A simplified stratigraphic classification of Jharkhand

Quaternary Deposit	Alluvial soil Gravels, Sandstone
Dhalbhum/ Jhargram Formation	laterite, Bauxite
	Rajmahal Trap (Basalt, clay stone, siltstone tuff) Dubrajpur Formation
	Mahadeva Formation Panchet Formation Raniganj Formation Barren Measure Barakar Formation Karharbari Formation Talchir Formation
Gondwana Super Group	
-----unconformity-----	
	Vindhyan, Kolhan Group (1500-1600)
-----unconformity-----	
	Newer Dolerites Arkasani Granophyre, Mayurbhanj Granite (2000-2100) Chakradharpur granite
	Ultramafic intrusives Dalma and Dhanjori lava (2100)
-----unconformity-----	
Dalbhum formations	(Carbonaceous phyllite, quartzites, cherts epidiorites, acid volcanic,
Chaibasa formations	Mica schists, quartzites, hornblende schists)
-----unconformity-----	
	Singhbhum Granite (2950)
Iron Ore Group	(Tuffaceous shale, phyllite, tuffs, Ferruginous chert, dolomite, acid intermediate, basic-ultrabasic volcanics, quartzites and conglomerate quartzite, BIF, metamorphosed mafic and ultramafic volcanics, cherty arenite)
-----unconformity-----	
	Biotite Tonalite Gneiss (3200)
	Older Metamorphic Group (OMG) (3800)