

STATE REVIEWS



Indian Minerals Yearbook 2019

(Part- I)

58th Edition

STATE REVIEWS
(Bihar)

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

March, 2021

BIHAR

Mineral Resources

Bihar is the principal holder of country's pyrite resources and possesses 94% of resources. The important mineral occurrences in Bihar are **coal** in Rajmahal coalfield; **limestone** in Kaimur (Bhabhua), Monghyr & Rohtas districts; **mica** in Nawada district; **quartz/silica sand** in Bhagalpur, Jamui, Monghyr & Nalanda districts; **quartzite** in Lakhisarai, Monghyr & Nalanda districts; and **talc/soapstone/steatite** in Monghyr district. Besides, occurrences of **bauxite** in Monghyr & Rohtas districts; **china clay** in Bhagalpur & Monghyr districts; **felspar** in Gaya, Jamui & Monghyr districts; **fireclay** in Bhagalpur & Purnea districts; **gold** in Jamui district; **granite** in Bhagalpur, Gaya, Jahanabad & Jamui districts; **iron ore (haematite)** in Bhagalpur district; **iron**

ore (magnetite) in Gaya & Jamui districts; **lead-zinc** in Banka & Rohtas districts; and **pyrites** in Rohtas district are reported (Tables - 1 & 2).

Exploration & Development

GSI carried out exploration for coal, REE, limestone and chromite in Bhagalpur, Kaimur, Rohtas and Gaya districts. Details of exploration activities conducted by GSI during 2018-19 are furnished in Table-3.

Production

Limestone is the only major mineral produced in Bihar. The value of minor mineral's production is estimated as ₹ 4272 crores for the year 2018-19. There was a single reporting mine and that of limestone in Bihar in 2018-19.

Table – 1 : Reserves/Resources of Coal as on 1.4.2019 : Bihar

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total/Rajmahal	309.53	1513.01	11.30	1833.84

Source: Indian Coal & Lignite Resources-2019, Natural Energy Resources, mission-II B; 2019 (GSI)

STATE REVIEWS

Table – 2 : Reserves/Resources of Mineral as on 1.4.2015 : Bihar

Mineral	Unit	Reserves				Remaining resources				Total resources (A+B)				
		Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331		Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)
			STD121	STD122			STD221	STD222						
Bauxite	'000 tonnes	-	-	-	-	-	-	-	-	4114	-	4114	4114	
China clay [#]	'000 tonnes	-	-	-	-	-	-	104	39	1296	-	1438	1438	
Felspar [#]	tonne	-	-	-	-	-	35147	-	4195	4871499	-	4910841	4910841	
Fireclay [#]	' 000 tonnes	-	-	-	-	-	-	-	-	44	-	44	44	
Gold	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ore	-	-	-	-	-	-	-	-	-	-	-	-	-	
(primary)	tonne	-	-	-	-	-	-	-	-	128884860	94000000	222884860	222884860	
Metal	-	-	-	-	-	-	-	-	-	-	-	-	-	
(primary)	tonne	-	-	-	-	-	-	-	-	21.6	16	37.6	37.6	
Granite [#]	-	-	-	-	-	-	-	-	-	-	-	-	-	
(Dim. stone)	'000 cu m	-	-	-	-	-	-	-	179000	698612	-	877612	877612	
Iron ore	-	-	-	-	-	-	-	-	-	-	-	-	-	
(Haematite)	'000 tonnes	-	-	-	-	-	-	-	-	55	-	55	55	
Iron ore	-	-	-	-	-	-	-	-	-	-	-	-	-	
(Magnetite)	'000 tonnes	-	-	-	-	-	-	-	-	2659	-	2659	2659	
Lead-zinc	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ore	'000 tonnes	-	-	-	-	-	-	-	435	11000	-	11435	11435	
Lead metal	'000 tonnes	-	-	-	-	-	-	-	-	24	-	24	24	
Zinc metal	'000 tonnes	-	-	-	-	-	-	-	14.75	24	-	38.75	38.75	
Limestone	'000 tonnes	12410	306	12715	3096	2558	1405	67926	38210	724118	10558	847872	860588	
Mica [#]	kg	-	-	-	-	-	-	-	-	13066667	7700	13074367	13074367	
Pyrite	'000 tonnes	-	-	-	13462	-	9680	-	51419	1500000	-	1574561	1574561	
Quartzite [#]	'000 tonnes	282	12260	12542	390	959	8090	5490	22822	227531	-	265282	277824	
Quartz-	-	-	-	-	-	-	-	-	-	-	-	-	-	
silica sand [#]	'000 tonnes	-	-	-	-	-	-	-	-	25755	-	25755	25755	
Talc-steatite-	-	-	-	-	-	-	-	-	-	-	-	-	-	
soapstone [#]	'000 tonnes	-	-	-	-	-	-	-	-	149	-	149	149	

Figures rounded off

Declared as Minor Mineral vide Gazette Notification dated 10.02.2015

Minor Mineral before Gazette Notification dated 10.02.2015.

STATE REVIEWS

Table – 3 : Details of Exploration Activities in Bihar, 2018-19

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
GSI							
Coal							
Bhagalpur	Lakshmipur block Rajmahal Coalfield	1:10000	5	13	5369.7	-	During G2 stage general exploration for Gondwana coal under the cover of younger formation of Lakshmipur block, Rajmahal Coalfield, Bhagalpur district, an area of 5 sq.km was mapped on 1:10,000 scale and a total of 5369.70 m has been drilled in 13 boreholes. Coal bearing horizon in this Lakshmipur block is confined within Barakar Formation only. Four regional Barakar coal seam zones (A, B, C & D in ascending order) were intersected in the boreholes. The total cumulative coal thickness reported in three boreholes was 519.55 m with thickest coal seam of 11.65 m encountered at a roof depth of 278.90 m. Coal seam zone B having the highest cumulative thickness of 115.45 m is the most important for their regional persistence and thickness.
Chromite							
Gaya	In and around Lakrahi and Ganjana villages	1:1000	2	-	-	400	Preliminary exploration (G3) for Cr, Ni and PGE in and around Lakrahi and Ganjana villages, Gaya district includes detailed mapping of 2 sq. km. area on 1:1000 scale, pitting & trenching of 202 Cu m was carried out. The mafic-ultramafic suite of rocks occurs as isolated lensoidal patches within the granitic rocks in the area. Detailed mapping was undertaken to delineate the different variants of rocks exposed in and around Lakrahi village. The mafic rocks in the area are represented by variants of gabbro viz. pitted gabbro and noritic gabbro, whereas, the ultramafic rocks are represented by light green pyroxenite, cumulus pyroxenite and podded pyroxenite. The targeted lithology i.e. the light green pyroxenite that yielded "PGE of 766 ppb (FS 2016-17)". High values of PGE have been obtained from the contact zone of light green pyroxenite with the gabbro. A total of nine bands of light green

(Contd)

STATE REVIEWS

Table – 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
							pyroxenite have been mapped with the help of off-set trenches. The continuity of the PGE-bearing light green pyroxenite has been established for 170 m length with a maximum width of 15 m. The chemical analysis of 98 trench and bedrock samples out of 400 samples showed insignificant values of total PGE (like 6 ppb, 7 ppb) which are contrary to higher analysed total PGE value of up to 766 ppb reported in field season 2016-17.
Chromite							
Gaya and Jehanabad	Around Northeast of Patal Ganga and East of Sapneri villages	-	2	-	415.5	50	A preliminary exploration for Vanadium-bearing magnetite-ilmenite mineralisation around the areas northeast of Patal Ganga and east of Sapneri villages, Gaya and Jehanabad districts was taken up in Patal Ganga and Sapneri blocks by means of detailed mapping (2 sq. km), bedrock sampling (50 nos.), pitting/trenching (100 cu.m) and drilling (415.5 m). Magnetite bodies in Sapneri block have limited surface dimension; the maximum being 100 m x 20 m whereas in Patal Ganga block the exposed ore body is of 200 m x 200 m surface dimension. Available analytical results of 19 BRS from magnetite bodies in Sapneri block indicated 40.17 % to 56.63 % Fe (average 49.57 %), whereas, 25 BRS collected from magnetite bodies in Patal Ganga block showed 44.92 % to 54.13 % Fe (average 50.54 %). Pit/trench samples indicated Fe(t) ranging from 18.99 to 54.13 % (average 45.19 %, n=45) in Sapneri block and from 20.06 to 51.4 % (average 40.75 %, n=42) in Patal Ganga block. Vanadium concentration of 1,597 ppm to 3,388 ppm from 3 BRS and 195 ppm to 4,190 ppm from 22 PTS was recorded in Sapneri block. About 6 BRS in Patal Ganga block yielded 3,868 ppm to 8,776 ppm of vanadium and 2 PTS showed vanadium concentration of 4,365 ppm and 6,406 ppm respectively. Drilling was carried out on 100 m x

(Contd)

STATE REVIEWS

Table – 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
							100 m grid in Patal Ganga block to affirm the depth persistence of the ore body. Six boreholes were completed and one borehole is proposed to be drilled 100 m north of Borehole no. BRPG-2. The work is under progress.
REE & RM							
Banka	Belhariya block						The 1.5 sq.km preliminary exploration areas in Belhariya block, Banka district for REE and RM at G3 stage was mapped in detail on 1:2,000 scale along with 300 m of auger drilling at 100 m x 100 m spacing with an average depth of 2.5 m and 52 cu. m. of trenching. In most of the trenches, two depositional layers were identified (L1 & L2). The L1 layer has more concentration of heavy minerals than L2 layer. Available analytical data of 120 auger soil samples showed encouraging values of tREE varying from 120.72 ppm to 1,045.38 ppm with an average of 426.05 ppm (UCC value 146 ppm). Out of 120 samples, 43 A-horizon soil samples analysed tREE value ranging from 218.42 ppm to 942.26 ppm, 56 B-horizon soil samples analysed tREE value ranging from 124.57 ppm to 807.75 ppm and 21 C-horizon soil samples analysed tREE ranging from 120.72 ppm to 1,045.38 ppm. The critical elements (Nd, Eu, Tb, Dy, Y, Er) concentration in some of the samples showed higher values such as Nd between 20.08 ppm and 184.10 ppm (UCC value 27 ppm), Tb from 0.74 ppm to 7.33 ppm (UCC value 0.7 ppm), Dy from 4.51 ppm to 49.86 ppm (UCC value 3.9 ppm), Y between 44 ppm and 131 ppm (UCC value 21 ppm) and Er varying from 2.58 ppm to 31.48 ppm (UCC value 2.3 ppm). Lithium showed very high concentration in four borehole samples with the analytical values ranging from 800.70 ppm to 1,064.68 ppm (UCC value 24 ppm) indicating a lithium-rich zone in the Belhariya Block. The exploration was continued from field season 2017-18.

(Contd)

STATE REVIEWS

Table – 3 (Concl'd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
Titanium (Ti), Vanadium (V) & Gallium (Ga)							
Kaimur	In and around Adhaura area	1:12500	118	-	-	98	Reconnaissance survey for strategic minerals (Ti, V, Ga) in laterite exposed in and around Adhaura area, Kaimur district involved Large Scale Mapping of 118 sq.km area on 1:12500 scale, pitting/trenching and collection of BRS, PCS and stream sediment samples for heavy mineral studies. Three major lateritic bodies with sizeable dimensions have been delineated in the area east of Karar, north-west of Dahar and west of Village Gudari, respectively. All these laterite bodies were found to be extending in the directions of prominent lineament (NW-SE, NE-SW and N-S). Analytical results of 98 BRS samples showed content of TiO ₂ varying from 0.92 to 16.62%, V from 12 to 1,189 ppm; Ga from 6 to 91 ppm and tREE from 124.06 to 433.32 ppm while 23 PTS sample showed variations of TiO ₂ , V and Ga from 2.32 to 10.53%; 55 to 674 ppm; and 17 to 57 ppm, respectively.
Limestone							
Rohtas	Bhora- Kathra block	1:4000	5.6	13	999.5	199 core samples	A G3 stage preliminary exploration for limestone in Bhora-Kathra block was carried out on request from DGM. The exploration block was seen mostly covered by alluvium where the target litho-unit, i.e., Rohtas limestone was exposed in the scarp faces of the abandoned mines/quarries. The limestone was found intercalated with shale and a few thin cherty bands. Drilling of 11 boreholes was completed and drilling of two boreholes is under progress. Drilling was carried out in 800 m x 800 m grid spacing followed by infilling in 400 m x 400 m spacing. Limestone was intersected mostly at depths varying from 20 m to 30 m although a few boreholes intersected limestone at shallower depths. The general thickness of the mineralised zone in all the boreholes was found to be around 30 m – 40 m. Analytical results of 199 core samples have been received. Exploration will continue in field season 2019-20.

STATE REVIEWS

**Table – 4 : Mineral Production in Bihar, 2016-17 to 2018-19
(Excluding Atomic Minerals)**

(Value in ₹'000)

Mineral	Unit	2016-17			2017-18			2018-19 (P)		
		No. of mines	Quantity	Value	No. of mines	Quantity	Value	No. of mines	Quantity	Value
All Minerals		1		42824426	1		42744817	1		42858706
Limestone	'000t	1	190	104495	1	43	24886	1	240	138775
Sulphur#	t	-	8159	-	-	7330	-	-	7050	-
Minor Minerals@		-	-	42719931	-	-	42719931	-	-	42719931

Note : The number of mines excludes minor minerals.

Recovered as by-product from oil refinery.

@ Figures for earlier years have been repeated as estimates.

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the

principal mineral-based industries in the organised sector in the State with their total installed capacities are furnished in Table - 5.

Table – 5 : Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Cement	
Eco cement Durgawati Bhabhua	1000
Kalyanpur Cements Ltd, Banjari, Dist. Rohtas.	1000
Kanodia Cement Bhabhua Bangar Cement	1200
Shree Cement Ltd, Jasoia Aurangabad Grinding Unit, Aurangabad.	3600
Shree Cement Ltd, New Bihar Cement plant, Aurangabad	2000
UltraTech Cement plant, Patliputra	1900
Petroleum Refinery	
Indian Oil Corporation, Barauni.	6000

Note: Data, for fertilizer industries, is taken from Indian Fertilizer Scenario, FAI Statistics.