

STATE REVIEWS



Indian Minerals Yearbook 2020

(Part- I)

59th Edition

**STATE REVIEWS
(Uttar Pradesh)**

(ADVANCE RELEASE)

**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES**

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UTTAR PRADESH

Mineral Resources

The State is the principal holder of country's andalusite & diaspore resources and possesses 78% andalusite, 37% diaspore, 17% sillimanite and 10% pyrophyllite. Important minerals occurring in the State are: **coal** in Singrauli coalfields, Sonbhadra district; and **diaspore & pyrophyllite** in Hamirpur, Jhansi, Lalitpur and Mahoba districts. Naini area of Allahabad district has good resources of high quality **silica sand**, an important source of glass sand, that contains 98% SiO₂ and a very low Fe₂O₃. It is found at Shankargarh and Lohargarh in Allahabad district and also Bargarh in Banda district. Silica sand is also found in Aligarh and Chitrakoot districts.

Other minerals that occur in the State are **andalusite & calcite** in Mirzapur district; **bauxite** in Banda, Varanasi & Lalitpur districts; **china clay & dolomite** in Banda and Sonbhadra districts; **felspar** in Jhansi district; **fireclay, limestone, potash & sillimanite** in Sonbhadra district; **ochre** in Banda district; **granite** in Banda, Hamirpur, Lalitpur & Mahoba districts; **iron ore (haematite)** and **rock**

phosphate in Lalitpur district (Table -1). The reserves/resources of coal along with details of coalfield are provided in Table-2.

Exploration & Development

During 2019-20, National Oil Companies (NOC) continued their operations for exploration of oil and gas in the State. GSI also carried out exploration in Sonbhadra & Lalitpur districts. The details of exploration carried out by GSI in the State are furnished in Table-3.

Production

Coal, limestone and sulphur were the mineral items produced in Uttar Pradesh during 2019-20.

The value of minor minerals' production was estimated at ₹5,614 crore for the year 2019-20.

The number of reporting mines in Uttar Pradesh was 2 in 2019-20 in case of MCDR minerals (Table-4).

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the important mineral-based industries in the Organised Sector in the State are furnished in Table - 5.

Table -2 : Reserves/Resources of Coal as on 1.4.2020 : Uttar Pradesh

| (In million tonnes) | | | | |
|------------------------|--------|-----------|----------|---------|
| Coalfield | Proved | Indicated | Inferred | Total |
| Total/Singrauli | 884.04 | 177.76 | - | 1061.80 |

Source: Coal Directory of India, 2019-20.

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Table – 1 : Reserves/Resources of Minerals as on 1.4.2015: Uttar Pradesh

| Mineral | Unit | Reserves | | | | | Remaining Resources | | | | | Total resources (A+B) |
|-------------------------------------|----------------|-------------------|--------------------|--------------|-----------------------|---------------------------|---------------------|---------------------|--------------------|--------------------------|--------------|-----------------------|
| | | Proved STD 111 | Probable STD121 | Total (A) | Feasibility STD211 | Pre-feasibility STD221 | Measured STD331 | Indicated STD332 | Inferred STD333 | Reconnaissance STD334 | Total (B) | |
| | | | | | | | | | | | | |
| Andalusite | '000 tonnes | - | - | - | - | - | - | - | - | 24200 | 24200 | 24200 |
| Bauxite | '000 tonnes | - | - | - | - | - | 10390 | 500 | 8018 | - | 18908 | 18908 |
| Calcite [#] | tonne | - | - | - | - | - | - | - | 11000 | - | 11000 | 11000 |
| China clay [#] | '000 tonnes | - | - | - | - | - | 11600 | 3447 | 10018 | - | 25065 | 25065 |
| Diaspore [#] | tonne | 861653 | 543478 | 940945 | 2346076 | 18548 | 10662 | 19855 | 545 | 234566 | - | 284175 |
| Dolomite [#] | '000 tonnes | - | - | - | - | - | 12622 | - | 3500 | 66230 | - | 82352 |
| Felspar [#] | tonne | - | - | - | - | - | - | - | 200000 | - | - | 200000 |
| Fireclay [#] | '000 tonnes | - | - | - | - | - | - | - | 3221 | - | - | 3221 |
| Granite [#] | | | | | | | | | | | | |
| (Dimension Stone) | '000 cu. m | - | - | - | - | - | - | - | - | 494819 | - | 494819 |
| Iron ore (Haematite) | '000 tonnes | - | 20000 | - | 20000 | - | - | - | - | 38000 | - | 58000 |
| Limestone | '000 tonnes | - | 12849 | 12849 | 33360 | 129180 | 38375 | 40000 | 31200 | - | 414878 | 427727 |
| Ochre [#] | tonne | - | - | - | - | - | - | 35000 | 10000 | - | 70000 | 70000 |
| Potash | million tonnes | - | - | - | - | - | - | - | 198 | 685 | - | 883 |
| Platinum Group of metals | tonne | - | - | - | - | - | - | 0.01 | - | - | - | 0.01 |
| Pyrophyllite [#] | tonne | 3598112 | 770113 | 1233511 | 5601736 | 132189 | 213979 | 213522 | 378450 | 66512 | 1070930 | 43200 |
| Quartz- Silica sand [#] | '000 tonnes | 445 | 19825 | 15144 | 35413 | 9415 | 30012.83 | 7048.4 | 957.34 | 6290 | 51590 | - |
| Rock Phosphate | tonne | - | - | - | - | - | 432898 | 3118586 | - | 740000 | 21481960 | - |
| Sillimanite | tonne | - | - | - | - | - | - | - | 2100000 | 9350000 | - | - |

Figures rounded off.

Declared as Minor Minerals vide Gazette Notification dated 10.02.2015

Minor Mineral before Gazette Notification dated 10.02.2015

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Table –3 : Details of Exploration Activities in Uttar Pradesh, 2019-20

| Agency/ Mineral/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---------------------------------|-------------------------------|---------|-----------------|---------------------|----------|-------------------|---|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| GSI | | | | | | | |
| Iron Ore | | | | | | | |
| Sonbhadra | Block 'B' Bharhari area | 1:4000 | 2.0 | 4 | 461.30 | 187 | Preliminary exploration (G3) was carried out in this area for iron ore. An area of 2.0 sq km was mapped on 1:4000 scale. The banded haematite chert/ jasper band was observed as a continuous band at the hill top with a strike length of 3.12 km and exposed width of 9 m to 54 m. A total of 461.30 m of drilling were carried out in four boreholes and 187 core samples were sent for chemical analysis during the study of the area. There were five mineralised zones with a cumulative thickness of 32.75 m for 30% Fe cut off and five zones for 35% Fe cut off. The average grade of the Fe at 30% cut off was 35.02% as reported in one borehole. The available 24 analytical results of BH-2 suggest Fe% with a minimum of 9.55% and maximum of 39.26%. |
| REE | | | | | | | |
| Sonbhadra | Mahuria- Domardiha area | - | - | - | - | 13 | Reconnaissance survey (G4) for REE-RM mineralisation was taken up in this area. Results of the 04 soil samples used in orientation survey yielded an average REE value of 343 ppm and 350 ppm for -80 and -100 fractions, respectively with average REE value for -120 fractions being 271 ppm. Analytical results of 9 bed-rock samples yielded REE values >800 ppm. The highest value was recorded from a micaceous schist hosted by K-feldspar granite gneiss from Rannu area. A leucogranite body with REE of 1,475 ppm exhibited good enrichment in HREEs. Besides this, high values were observed from K-feldspar granite gneisses. |

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Table – 3 (contd)

| Agency/ Mineral/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---------------------------------|----------------------------|---------|-----------------|---------------------|----------|-------------------|---|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| Sonbhadra | Nawatola Laband | - | - | 06 | 500.85 | 183 | Preliminary exploration (G3) was carried out in this area for REE mineralisation which involved drilling of 500.85 m, pitting/trenching of 84 cu. m and collection of 50 channel samples, 83 pit-trench samples and 50 soil samples. A total of 6 scout boreholes were drilled based on the channel/trench samples with REE >900 ppm. Strike length of enriched REE zone is 1.5 km with an average width of 400 m. This zone was demarcated based on relatively higher concentration of REE in surface samples, i.e., 500 ppm. Also, maximum REE concentration in soil sample yielded up to 2,729 ppm. In Borehole-1, weighted average grade of REE+Y was recorded at 1,065.69 ppm for a total thickness of 23.50 m. In Borehole-2, weighted average grade of REE was recorded at 992.2 ppm for total thickness of 10.50 m and in Borehole-3, weighted average grade of REE varied from 973.5 to 1,272.8 ppm with weighted average of 1,064.9 ppm for total thickness of 13.50 m. |

Platinum Group of Metals (PGM)

| | | | | | | | |
|----------|--------------------------------|---------|-----|---|---|---|--|
| Lalitpur | Gidwaha Girar pahar area | 1:12500 | 100 | - | - | - | Reconnaissance survey (G4) for PGE mineralisation in this area involved mapping of 100.0 sq. km area on 1:12500 scale. Analytical result of Pt & Pd showed values <5 and <10 ppb, respectively. Two channel samples of ultramafic rock collected from Village Bhikampur showed Pt values of 10.7 ppb & 10.5 ppb and Pd values of 6.3 & 5.7 ppb, respectively. Analytical results for base metal showed value of Cr & Ni ranging from 17 to 4,722 ppm & 3 to 2,325 ppm, respectively. |
|----------|--------------------------------|---------|-----|---|---|---|--|

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Table – 3 (contd)

| Agency/ Mineral/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---------------------------------|-----------------------------|---------|-----------------|---------------------|----------|-------------------|--|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| | | | | | | | On integration of exploration data it was found that the ultramafic body mapped at Village Bhikampur extend for a strike length of about 1 km with width of about 125 m and showed highest value of chromium (2,050-4,722 ppm) and moderate anomaly of nickel (627-1,525 ppm). |
| Gold | | | | | | | |
| Sonbhadra | Dala- Roopadandi area | - | - | - | - | - | Reconnaissance survey was taken up to locate placer gold and diamond in the study area. Conglomerate body was traced from Dala to Roopadandi, the strike length of the conglomerate was approximately 13 km and width of the body varied from 10-20 m. The conglomerate body traced in Hardi area showed a width of 30-70 m with approximately 4.5 km strike length. As per the available chemical results, gold values were recorded at <50 ppb and base metal & other elements showed low values while Mn showed values between 06 and 2,884 ppm. |
| Diamond | | | | | | | |
| Banda | - | - | - | - | - | 101 | Reconnaissance survey of Kimberlite/ Lamproite and secondary diamonds in Shahpur Block in parts of Panna and Satna districts, Madhya Pradesh and Banda District of Uttar Pradesh (G4) was carried out. About 101 regional and detailed stream sediment samples were collected from appropriate trap sites, such as, older alluvium, bedrock obstruction, joint crevasses, gravel layers in vertically cut river sections, manually dug pits in gravel and sand bed, channel floor, channel bar, point bar, uneven rocky floor, root trapping etc. Heavy Mineral Concentrates (HMC) was examined for kimberlite indicator |

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Table – 3 (contd)

| Agency/ Mineral/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---------------------------------|----------------------------|---------|-----------------|---------------------|----------|-------------------|---|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| | | | | | | | minerals (Picro ilmenite, Pyrope garnet, Cr-spinel and micro diamonds) under stereo microscope. Through HMS, a few suspected Kimberlite indicating Minerals including garnets, spinels, chromites and ilmenites were identified which were yet to be confirmed through EPMA. During the search of diamond source rock, two ultramafic dykes were reported from Gudha Kalan. On the basis of petrological and geochemical studies, the altered ultramafic rocks showed affinity towards lamprophyres. These dykes vary in dimension from 2-4 m in length and 15-20 cm in width. They were seen intruded within coarse-grained porphyritic granite. The detailed petrographic study of the ultramafic rock depicted presence of pyroxene porphyroclasts, some pseudomorph of olivine/pyroxene altered to talc/actinolite in a fine groundmass of alkali glass, pyroxene and amphibole. Mineral chemistry plots showed close affinity towards lamproites. Geochemical plots showed sub-alkaline-calc-alkaline magmatic affinity and lamprophyric nature. |

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Table – 3 (concl'd)

| Agency/ Mineral/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---|----------------------------|---------|-----------------|---------------------|----------|-------------------|--|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| Directorate of Geology and Mining, Uttar Pradesh | | | | | | | |
| Iron Ore | | | | | | | |
| Lalitpur | Solda Uldana area | 1:5000 | 1.0 | - | - | 310 | During 2019-20, reconnaissance exploration for iron ore was taken up to prove iron ore deposit in this area. About 1.00 sq.km of area was mapped on 1:5000 scale and 104.5 cu. m material was excavated in 6 pits. A total 310 samples were collected, i.e., 208 grid samples, 70 pit samples for chemical analysis and 32 grid surface samples for petrological study. |
| Gold | | | | | | | |
| Sonbhadra (Western Block) | Hardi area | 1:2000 | - | - | - | - | DGM has continued exploration work in this area with an objective to search for gold deposit in Hardi area. Detailed investigation of eastern block showed a gold deposit extending over a strike length of 1.2 km with average width and depth of 15.5 m and 18 m, respectively. The average grade of the ore was 0.30 ppm. The exploration carried out in Hardi area (western block) comprised of geological mapping of 0.1 sq.km area on 1:2000 scale, excavation of 50 cu. m through 2 trenches each of dimension 25 m x 1 m x 1 m, and collection of 40 chemical samples for chemical analysis. In Berwar area, Lalitpur district, search for placer gold was continued by geological mapping of 0.3 sq.km on 1:2000 scale alongwith geophysical magnetic survey of 0.16 sq km . About 88 cu. m material was excavated in three trenches and a pitting of dimension 1 m x 1 m x 1 m was also carried out in the area and 103 samples were collected for analysis. An average grade of 0.16 g/t Au was recorded based on chemical analysis received so far. |

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Table – 3 (contd)

| Agency/ Mineral/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---|---|----------|-----------------|---------------------|----------|-------------------|---|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| Directorate of Geology & Mining, Uttar Pradesh | | | | | | | |
| Dimensional Granite | | | | | | | |
| Lalitpur | Madawara & Talbehat | 1:50000 | 50.00 | - | - | 06 | Different varieties of dimensional granite in six new blocks aggregating an area of 20.08 hect. were identified. Samples of different sizes were collected for evaluation of quality, cutting /polishing etc. |
| Baryte | | | | | | | |
| Lalitpur | Mathara Dang (Bar-Larwari) area | 1:12500 | 60.00 | - | - | 74 | During G4 stage reconnaissance survey, trenching & pitting (2 each) of 28 cu m was carried out alongwith collection of samples. The chemical analysis showed the presence of baryte and base metals. |
| Rock phosphate | | | | | | | |
| Lalitpur | Semarkhera, Tori, Pisanari & Sonrai | 1:1000 | 0.5 | 1 | 96.05 | 281 | A G2 stage study was carried out to assess resources of rock phosphate in the area. The total strike length of the phosphatic sediments is about 7.5 km from Semarkhera in the east upto Sonrai in the west. Three trenches were excavated and collected 186 samples. |
| Rock phosphate | | | | | | | |
| Lalitpur | Pipariya, Ikauna area | 1:12,500 | 20 | - | - | 20 | The study is continued. Exploration work was taken up in search of PGE in around Pipariya, Ikauna area, Lalitpur district. The ultramafic/mafic rocks of Madaura-Ikauna-Pindar tract is the eastern extension of Madaura ultrabasic complex. A series of ultramafic rocks are randomly exposed as lensoidal intrusive discrete bodies in the form of isolated outcrops into the granite-gneisses around 20 km stretched in Madaura-Ikauna-Pindar tract. The exploration work involved mapping of 20 sq km area on 1:12,500 scale, excavation of 167 cm m material in 4 trenches and collection of 16 samples. |

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**Table – 4: Mineral Production in Uttar Pradesh, 2017-18 to 2019-20
(Excluding Atomic Minerals)**

| (Value in '000) | | | | | | | | | | |
|-----------------------------|-------|--------------|-------|---------------------|--------------|-------|-----------------|--------------|-------|---------------------|
| Mineral | Unit | 2017-18 | | | 2018-19 | | | 2019-20 (P) | | |
| | | No. of mines | Qty | Value ^{\$} | No. of mines | Qty | Value | No. of mines | Qty | Value ^{\$} |
| All Minerals | | 2 | | 56914337 | 2 | | 56988986 | 2 | | 56893975 |
| Coal | '000t | - | 18309 | - | - | 20275 | - | - | 18030 | - |
| Limestone | '000t | 2 | 2399 | 773776 | 2 | 2622 | 848425 | 2 | 2806 | 753414 |
| Sulphur [#] | t | - | 47691 | - | - | 51738 | - | - | 47955 | - |
| Minor Minerals [@] | | - | - | 56140561 | - | - | 56140561 | - | - | 56140561 |

Note: The number of mines excludes Fuel and Minor minerals.

\$ Excluding the value of Fuel minerals.

Recovered as by-product from oil refinery.

@ Figures for earlier years have been repeated as estimates because of non-receipt of data.

Table-5 : Principal Mineral-based Industries

| Industry/plant | Capacity ('000 tpy) |
|--|----------------------------------|
| Abrasives | |
| John Oakey and Mohan Ltd, Ghaziabad | NA |
| Micro Lapping Abrasive, Near Munni Devi Temple, Seohra, Dhampur | 0.08 (Abrasive powder) |
| Aluminium | |
| Hindalco Industries Ltd, Renukoot | 700 (alumina) 345 (aluminium) |
| Asbestos Product | |
| Asbestos Cement Ltd, Raibareli | NA |
| Uttar Pradesh Asbestos Product Ltd, Mohanlalganj, Lucknow | NA |
| Cement | |
| ACC Ltd, Tikaria, Distt Sultanpur (G) | 3000 |
| Ambuja Cement, Dadri, Gautam Budh Nagar (G) | 1800 |
| Raebareli Cement Works, Birla Corporation (G) | 1300 |
| Heidelberg Cement (Diamond Cement), Madora Jhansi (G) | 2700 |
| Jaypee Cement, Sadvakhurd (Blending Unit) | 600 |
| Kanodia Cement, Bulandsahar | 330 |
| Shree Cement, Sikandarabad (G), Bulandsahar | 2000 |
| The KCP Ltd., Dalla Cement Factory, Dalla Distt Sonabhadra | 500 |
| Jaypee Cement, Chunar Cement Factory, Chunar, Distt Mirzapur (G) | 2500 |

(contd)

Table - 5 (contd)

| Industry/plant | Capacity ('000 tpy) |
|---|---|
| Jaypee Cement, Tanda, Ayodhya, Distt Faizabad (G) | 1000 |
| Jaypee Cement, Churk Mirzapur (G) | 1500 |
| Birla Corp. Ltd.(Erstwhile Reliance Cement), Kundanganj, Distt Raebareli | 2000 |
| UltraTech Cement, Dadri (G) | 1300 |
| UltraTech Cement, Aligarh (G) | 1300 |
| UltraTech Cement Ltd. Ayodhya, Ambekar Nagar | 1000 |
| UltraTech Cement Ltd. Bara , Allahabad | 4000 |
| UltraTech Cement Ltd. Dallakolta, Robertsonganj | 500 |
| Mangalam Cement, Aligarh (G) | 750 |
| Electrode | |
| Ankit Sangal, Sujroo, Muzaffarnagar | 0.85(electrode no 10) 0.15(electrode no 8) |
| Fertilizer | |
| Asian Fertilizers Ltd, Deokahia, Gorakhpur | 66 (SSP) |
| Coromandel International Ltd (Formerly Liberty Phosphate Ltd), Raebareli | 132 (SSP) |
| Jubilant Agri and Consumer Products Ltd (Formerly Vam Organic Chemicsls Ltd), Bhartiagram, Gajraula | 165 (SSP) |
| IFFCO, Phulpur (Unit I & II), Distt Allahabad | 1697.8 (Urea) |
| IFFCO, Aonla (Unit I & II) | 1999.8 (Urea) |
| Indo Gulf Fertilizer Ltd (a unit of Aditya Birla Nuva Ltd), Jagdishpur | 1105.5 (Urea) |
| Kanpur Fertilizer & Cement, (formerly Duncan India Ltd), Kanpur | 722 (Urea) |

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Table - 5 (contd)

| Industry/plant | Capacity ('000 tpy) |
|---|---|
| Khaitan Chemicals & Fertilizers Ltd, Goramachhia, Jhansi. | 132 (SSP) 52.8 (H ₂ SO ₄) |
| Khaitan Chemicals & Fertilizers Ltd, Malwan, Fatehpur. | 115 (SSP) 52.8 (H ₂ SO ₄) |
| KRIBHCO Shyam Fertilizer, Piprola Shahajahanpur. | 864.6 (Urea) |
| Madan Madhav Fertilizers & Chems Pvt. Ltd, Fetehtarh. | 24 (SSP) |
| Natraj Organics Ltd, Muzaffarnagar. | 60 (SSP) |
| Tata Chemicals Ltd, Babrala, Distt Badaun. | 1155 (Urea) |
| V. K. Phosphates Ltd, Bartara , Shahjahanpur | 33 (SSP) |
| Natraj Organics Ltd, Muzaffarnagar. | 60 (SSP) |
| Tata Chemicals Ltd, Babrala, Distt Badaun. | 1155 (Urea) |
| V. K. Phosphates Ltd, Bartara , Shahjahanpur | 33 (SSP) |

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Table - 5 (concl'd)

| Industry/plant | Capacity ('000 tpy) |
|--|--|
| Ferroalloys | |
| Hindustan Ferro Alloys, Hamirpur. | 3.2 |
| The India Thermit Corpn. Ltd, Kanpur. | 0.3 |
| Iron & Steel | |
| Malvika Steel Ltd, Jagdishpur. | 511 (pig iron) 600 (saleable steel) |
| Sponge Iron | |
| RLJ Concast Pvt.Ltd, Baragaon Chunar | 60 |
| S. A.Iron & Alloy Pvt.Ltd.Jeewanthpur, Mughalsarai | 90 |
| Petroleum Refinery | |
| IOCL, Mathura. | 8000 |

(G); Grinding Unit

Note: Data, not readily available for fertilizer and cement Industries on respective websites, is taken from Indian Fertilizer Scenario, FAI Statistics, and Survey of Cement Industry & Directory, respectively.