

# Mineral Potential in Vidarbha: Future Prospects

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## Abstract

Vidarbha region is endowed with a variety of rich mineral resources. It contributes 93% value of production of Maharashtra State and about 3.5% of the whole country. Important amongst these minerals are coal, iron ore, manganese, limestone, dolomite, kyanite, sillimanite, fluorite, etc. The authors briefly review the resource potential and future prospects of these minerals.

**Keywords:** Deccan traps, Precambrian, Coal, Limestone, Iron.

## 1. Introduction

Vidarbha which occupies southern part of the central India, with a variety of rich mineral resources like coal, iron ore, Manganese, Limestone, Dolomite, Kyanite, Sillimanite, Fluorite, etc., has a rich history of ancient mining and metallurgy, evidence for which are available in the records. The climate of Vidarbha region is tropical to subtropical monsoon type with temperature ranging from 48°C during summer to around 7°C in winter. The average rainfall of the area is 1346 mm. Humidity varies during the year from 64 to 72% in summer, minimum being 36%.

## 2. Geological Setup of the Region

Vidarbha region of Maharashtra is not only a geographical centre of India, but also a rich mineral belt of peninsular shield. Most part of the region is occupied by Deccan traps of the upper cretaceous, Lower Eocene Age. Gondwana formation is spread in Nagpur and Chandrapur district which are followed toward east by various Precambrian rocks.

Coal in this region is confined to Gondwana and many mineral deposits including Manganese, Limestone are hosted by Precambrians. Recoverable reserves of various minerals in Vidarbha are given in Table 1.

**Table 1: Mineral Reserves in Vidarbha as on 31-03-2014**

S.N.	Mineral	District	Total Reserves (Million tonnes)
<b>(I) Fuel Minerals</b>			
1	Coal	Nagpur	1294.79
		Chandrapur	3202.98
		Yavatmal	1070.774
		Wardha	8.16
		<b>Total</b>	<b>5576.704</b>
<b>(II) Industrial Minerals</b>			
1	Limestone	Chandrapur	750.325
		Gadchiroli	172.000
		Yavatmal	413.900
		Nagpur	31.700
		<b>Total</b>	<b>1367.925</b>

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2	Clay	Nagpur	3.555
		Amravati	1.500
		Chandrapur	1.100
		<b>Total</b>	<b>6.155</b>
3	Baryte	Chandrapur	0.1361
		Gadchiroli	0.0004
		<b>Total</b>	<b>0.1365</b>
4	Dolomite	Nagpur	28.740
		Yavatmal	29.810
		Gadchiroli	2.750
		<b>Total</b>	<b>61.300</b>
5	Quartz	Gadchiroli	0.690
		Bhandara	2.073
		Gondia	0.050
		<b>Total</b>	<b>2.813</b>
6	Kyanite & Silliminate	Bhandara	2.618
7	Fluorite	Chandrapur	0.10
<b>(III) Ferrous Minerals</b>			
1.	Manganese	Nagpur	9.389
		Bhandara	11.464
		<b>Total</b>	<b>20.853</b>
2	Iron Ore	Gadchiroli	178.61
		Chandrapur	2.18
		Bhandara	4.65
		<b>Total</b>	<b>185.44</b>
3	Chromite	Nagpur	0.056
		Bhandara	0.480
		Chandrapur	0.010
		<b>Total</b>	<b>0.546</b>
4	Vanadium Ore	Gondia	4.65
5	Tungstun Ore	Nagpur	19.98
<b>(IV) Non Ferrous Minerals</b>			
1.	Copper Ore	Chandrapur	6.40
		Nagpur	1.308
		<b>Total</b>	<b>7.708</b>
2	Zinc Ore	Nagpur	8.27
<b>(V) Building Stone Mineral</b>			
1.	Granite	Nagpur	4.880 (Coloured)
		Chandrapur	24.00 (Black)

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	Gadchiroli	1.066 (Coloured)
	Bhandara	178.00 (Coloured)
	<b>Total</b>	<b>207.946</b>
<b>(VI) Refractory Mineral</b>		
1.	Pyrophyllite	
	Bhandara	0.995
	Chandrapur	3.12
	<b>Total</b>	<b>4.115</b>

## Mineral Resources of Vidarbha

The important minerals occurring in Vidarbha are coal, iron ore, manganese, limestone, bauxite, dolomite, kyanite and silliminite. The other minerals occurring are barytes, ilmenite, clay, copper, chromite, fluorite, quartz, tungsten, zinc, pyrophyllite, etc.

### Resources of Important Minerals

#### Coal

Vidarbha region of Maharashtra is endowed with large deposits of coal. The resources of coal in the Vidarbha occur in Nagpur, Chandrapur, Yeotmal and Wardha district. So far 5,576 MT of coal reserves is proved in Vidarbha.

#### Manganese Ore

The manganese ore deposits occurring in central India are supposed to be the most promising deposits in the country. The chief ore deposits in Vidarbha occur as an arcuate belt passing through Kandri-Mansar Area of Nagpur district which forms the middle portion of the belt—Dongri Buzurg and Sitasavangi in Bhandara district. Vidarbha is one of the leading manganese ore producing region in India. Almost all manganese ore production of the state comes from Nagpur and Bhandara. At present the manganese ore in this area is mined by the public sector undertaking, namely, the Manganese Ore India Limited and by several other small private mine owners. The total reserves of manganese ore in Vidarbha are estimated as 20.85 MT. The manganese ore mined in Vidarbha is mostly utilized in the manufacture of ferro manganese, silico-manganese and iron and steel industries and to a small extent in production of battery cells.

#### Iron Ore

Important iron ore occurrences in the Vidarbha are confined to the districts of Gadchiroli, Chandrapur and Gondia. Out of the total estimated reserves of 185.44 MT of iron ore, the Gadchiroli district alone accounts for 178.61 MT, the rest 4.65 MT being from areas of Bhandara and 2.18 MT from Chandrapur district. The iron ore deposits around Surjagarh in Etapalli Tehsil of Gadchiroli district is the biggest deposit in Vidarbha.

#### Limestone

Extensive deposits of limestone occur in Yavatmal and Chandrapur districts of Vidarbha. Limestone is used for manufacturing cement, as flux in iron and steel industry and in industries like paper, sugar, textile, etc. The estimated reserves of Limestone in Vidarbha are 1367.925 million tones. The limestone deposits are mostly located in Chandrapur, Yavatmal and Gadchiroli districts. Minor deposits are located in Nagpur district in the form of calcitic and dolomitic marbles in the Sausar group of formations. The cement grade limestone is mostly confined to Rajur, Mukutban, Sindola-Paramodoh, Gowari-Pathri, Velabai-Kurai areas in Yavatmal districts, Awarpur-Bakardi-Nokari-Kusumbi, Chandur-Thutra, Jajoli-Somanpalli, Chedwai-Bari, Nanadgaon-Ekodi, Lakhapur-Pimpalgaon, etc., areas in Chandrapur district and Devlamari-Katepalli area in Gadchiroli district.

#### Dolomite

Extensive deposits of dolomite occur in the districts of Chandrapur, Yavatmal and Nagpur in Vidarbha. Some of the dolomite produced in Vidarbha is at present utilized as flux in the Iron and Steel Industry and as dust in the coal mines and manufacture of mosaic tiles.

***Kyanite and Sillimanite***

The mineral kyanite and Sillimanite occurs in Bhandara district of Vidarbha. It is used for manufacture of high grade refractory required for various metallurgical industries, cement manufacture, glass manufacture, etc., where generation of high temperature is involved in the process. The estimated reserves of Kyanite and Sillimanite of all grades in Vidarbha are of the order of 2.61 Million Tonnes. The important occurrences are near villages of Pohra, Dahegaon, Pimpalgaon, Dudhla, Pardi, Jamgaon, Navargaon, etc., in Bhandara district.

***Copper Ore***

Copper has undoubtedly the widest application of all the non-ferrous metals. Its physical properties provide a combination of a number of extremely useful characters which have provided it with the high position it holds amongst the base metals. Copper ore occurrences have been observed at Thanewasna, Dubarpeth in Chandrapur district, Pular-Parsodi, Ranbori-Kolar-Tambe Kani, Ranmangli, Kitari, Thutanbori, etc., in Nagpur district. GSI has carried out the exploration work in Thanewasna and Thutanbori areas of Chandrapur and Nagpur districts respectively and GSI has indicated total reserves of copper ore to be of the order of 7.70 Million Tonnes with copper content ranging from 0.81 to 2.73%.

***Gold***

It is the basic metal of currency and coin age and so having an important high position in the metal group of minerals. The investigation for gold has been carried out in the state by GSI. Detailed investigation carried out by GSI in the Parsori (West-block) of Nagpur district has indicated good potential which is subject to further detailed exploration.

***Tungsten Ore***

Tungsten is the strategic mineral which is widely used in electrical and electronic industries. It has wide application in space technology, steel industry, etc. Tungsten ore occurs in Kuhi, Khobna, Agragaon, Ranbori, Kolari-Bhaori areas of Nagpur district. The reserves estimated for tungsten in the state is about 19.98 Million tonnes. GSI and MECL have carried out vigorous exploration work for tungsten in the above said localities.

***Zinc Ore***

Zinc is used in the various types of alloys, in manufacture of dry batteries, in textiles, rubber, chemical and metallurgical industries, etc. Zinc ore occurs in few localities of the state mostly in Nagpur district, i.e., Anjani, Tambekhani, Kolari-Bhaori areas. The total reserves indicated by GSI in Nagpur district are about 8.27 Million tonnes with 5.4% zinc.

***Chromite***

It is mostly used in metallurgical refractory and chemical industries. Small deposits of chromites are known to occur in Nagpur, Bhandara, and Chandrapur district of Vidarbha. The deposits of chromite are found in Bhandara, Nagpur and Chandrapur districts near villages of Pauni, Taka, Dhamangaon, and Ballarpur respectively. The total proved reserves of chromite are 0.546 Million tonnes.

***Baryite***

This mineral is known to occur in Phutana, Devada, etc., areas in Chandrapur districts. However, total reserves from various localities are estimated at only 0.136 Million tonnes. Baryite is mostly used in oil well drilling and paint industry.

***Decorative Building Stones***

The building stones suitable for decorative purposes have been discovered in Nagpur, Chandrapur & Gadchiroli, Bhandara, Nanded district of Vidarbha. These includes granites, gabbro, syenites, dolerite, basalts, sandstone, etc. About 207.946 Million metre cube of various decorative stones have been indicated so far by the state geology and mining department.

In addition, Vidarbha has vast resources of minor minerals in the form of building materials like stones, murrum, sand, etc.

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### Mineral Occurrences in Vidarbha

Vidarbha is the sole producer of corundum and is the second largest producer of manganese ore after Orissa. The principal mineral bearing belts in Maharashtra are Vidarbha area in the east. Important mineral occurrences are shown in the table below (Table 2)

Table 2: Important Minerals of Vidarbha

S.N.	Name of Mineral	Occurrences
1.	China-clay	Amravati, Bhandara, Chandrapur, Nagpur.
2	Chromite	Bhandara, Chandrapur, Nagpur.
4.	Coal	Yavatmal, Chandrapur, Nagpur districts.
5	Dolomite	Yavatmal, Chandrapur, Nagpur districts.
6	Fire-Clay	Amravati, Chandrapur, Nagpur.
7	Fluorite	Chandrapur district.
8	Shale	Chandrapur district.
9	Iron Ore (Hematite)	Chandrapur, Gadchiroli
10	Iron Ore (Magnetite)	Gondia District.
11	Kyanite	Bhandara and Nagpur district.
13	Lime Stone	Chandrapur, Gadchiroli, Nagpur, and Yavatmal districts.
14	Manganese Ore	Bhandara, Nagpur districts.
15	Corundum	Bhandara, Chandrapur districts.
16	Pyrophyllite	Bhandara, Chandrapur districts.
17	Sillimanite	Bhandara, Chandrapur districts.
18	Quartz and Silica sand	Bhandara Gadchiroli, Gondia, Nagpur districts.
19	Quartzite	Bhandara, Gadchiroli, Gondia and Nagpur district.
20	Barytes	Chandrapur and Gadchiroli district.
21	Copper	Bhandara, Chandrapur, Gadchiroli and Nagpur districts.
23	Gold	Bhandara and Nagpur districts.
24	Granite	Chandrapur, Gadchiroli, Nagpur.
26	Lead & Zinc	Nagpur districts.
27	Marble	Bhandara and Nagpur districts.
28	Tungsten	Nagpur district.
29	Silver	Bhandara district.
30	Vanadium	Bhandara district.
31	Steatite	Bhandara.
32	Titanium	Gondia.

### Future Prospects

Vidarbha region holds more than 70% mineral resources of Maharashtra. It is the leading producer of Flourite (Graded) in the country. Vidarbha is the major producer of Manganese ore and Kyanite accounting for more than 20 per cent and 35 per cent respectively of the total production of the mineral in the country.

The investigation for Gold has been carried out in Vidarbha by GSI. Detailed investigation carried out by GSI in the Parsori (West Block) of Nagpur district has indicated good potential.

Tungsten is a strategic mineral which is widely used in electrical and electronics industry. It has wide application in space technology, steel industry, etc. The tungsten ore occurs in Kohi, Khobra, Agragaon, Ranbori, Kolari-Bhaori areas of Nagpur district. The reserves estimated for Tungsten in the Vidarbha is about 19.98 Million tonnes. GSI and MECL have carried out rigorous exploration work for Tungsten in the above said localities.

A few minerals of base metals, Tungsten, Gold, etc., have been identified. Exploration activities will have to be extended to such minerals deposits like lime stone, iron ore & others for demarcating good quality mineral reserves. There is a scope for expanding exploration efforts using latest exploration techniques, new improved techniques of drilling/sampling and the new concept of geological modeling and deep drilling.

#### Status of Exploration

The directorate of Geology and Mining is having 20 diamond core drill machines. Presently directorate is undertaking prospecting for coal, sillimanite-pyrophyllite, and bauxite and iron ore along with general survey schemes. During field season 2014-15 prospecting work was taken in the following areas of Vidarbha. (Table 3):

S.N.	Mineral	Name of Area	District
1.	Coal	Nand-Panjrepar	Nagpur
		Dawa-Phukeshwar	Nagpur
		Ashtona-Kothurna-Mangli, Adkoli-Khadakdoh	Yeotmal
		Wislon	Chandrapur
		Nandori, Nandori south	Chandrapur
		Chalbardi	Chandrapur
		Takli & Panwadala	Chandrapur
2.	Sillimanite-Pyrophyllite	Wali-Khatgaon	Chandrapur
3.	Iron ore	Lohara	Chandrapur

To locate occurrences of different minerals in various parts of Vidarbha, geological surveys are carried out initially; this is followed by drilling with a view to assess the mineral resources of the area. The information so generated by directorate is useful for setting up of mineral based industries and for proper exploration of mineral wealth of the Vidarbha.

#### Conclusion

Vidarbha has potential to support mineral based industries on the basis of reserves of metallic, non-metallic and industrial minerals. Vidarbha holds potential for Gold and Tungstun mining for which economic viability needs to be explored. Thus mineral reserves of Vidarbha region can have deep socio-economic impact on development of Vidarbha in future years.

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