India has a long history of gold mining, but current production levels are very low; in 2015 India mined less than 2t. The industry does, however, have potential. Mineral reserves and resources total 71.9t and 574.3t respectively. Over the coming years mine production is expected to grow modestly as new mines enter the production phase. But the industry faces significant challenges. For mining to develop in India, regulations need to be reviewed and the industry needs investment.

**Gold mining history**

India has a rich heritage of gold mining, albeit on a small scale

Although gold mining dates back to the first millennium BC, in the twentieth century the sector was dominated by the Kolar Gold Field, near Bangalore. The field is hosted within the Kolar Greenstone Belt, a 3km to 6km wide by 80km long band of greenstone geology – a terrain similar to that which hosts many of the world’s most significant gold discoveries. The Belt predominantly lies along the southeast edge of the state of Karnataka, but also under parts of Andhra Pradesh and Tamil Nadu.

The Kolar Gold Field produced more than 800t of gold during its 120 year history before its closure in 2001. During the first two decades of mining (1884–1904) the average grade of ore produced from the shallow underground mine was an impressive 45g/t, while over its total 120-year life span the average ore grade was 15g/t. In comparison, gold grades from South Africa’s prolific Witwatersrand Basin have averaged around 9g/t over a comparable time frame.

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118 Kolar Gold (www.kolargold.com.au)
119 Geological Survey of India (www.portal.gsi.gov.in)
120 Kolar Gold (www.kolargold.com.au)
121 South African Chamber of Mines (www.chamberofmines.org.za)
During the latter years of the Kolar Gold Field, gold was primarily extracted from three mines (Champion, Mysore and Nandydroog) within the East Kolar region. Mining became uneconomic in the late 1990’s due to poor management, a lack of exploration, under-investment and a misplaced focus on labour-intensive deep underground mining. The Kolar operations were finally abandoned in 2001. By this time, the mine had reportedly reached a depth of 3,200mn, while workings stretched along a 7.3km strike and included 100 shafts and 1,400km of underground development.

The other significant gold producer in India has been Hutti Gold Mine, located in the Raichur district of Karnataka. The operation initially entered production in 1902, although it subsequently closed in 1918. Since its restart in 1947, through to 2014, it has produced some 90t of gold, and is currently the only gold producer in India. Ore from the main Hutti mine is now supplemented by satellite feeds from the Uti (open pit) and Hira-Buddinni (underground) deposits, and the company currently has reserves for another 50 years of mining (Chart 40).

Historically, gold has also been produced from a number of other deposits, including as a by-product of domestic copper production. These additional sources have been limited in volume. The other main source of gold production in India is from Birla Copper’s copper smelter at Dahej, Gujarat, which processes imported copper concentrate. The plant has an installed gold capacity of 15t/yr, although is currently only producing around 8–9t/yr.

Chart 40: Indian mine production from primary source* 1970-2015

*Mine production includes production from primary sources only and does not include gold output from secondary sources e.g. Birla Copper Smelter which processes imported copper concentrate.
Source: Indian Bureau of Mines; Metals Focus

122 Hutti is currently the only company mining for gold in India, and is fully-owned by the Government of Karnataka.
123 Hutti Gold Mines [www.huttigold.co.in]
124 Birla Copper is a subsidiary of Hindalco Industries.
**India gold mineral reserves and resources**

Gold has been discovered in a broad range of locations across India, although nearly all economically extracted mineral reserves are currently located in Karnataka. According to data published by the Ministry of Mines, India’s current defined gold reserves total 71.9t (14.6Mt at 4.9g/t). In addition, 568.5t of gold (480.2Mt at 1.18g/t) is defined in the primary (hard rock) resource category, while 5.9t (26.1Mt at 0.2g/t) has been defined within placer deposits (Chart 41).

These reserves are concentrated regionally: over 99% of gold mineral reserves are located in the state of Karnataka. The remaining gold reserves are in Jharkhand, although at under 0.2t, these are trivial.

Gold resources – gold deposits that are potentially economically viable – are a lot more geographically diverse. Over 50% of mineral resources are located in Karnataka, 33% are in Rajasthan, 6% in Bihar and 5% in Andhra Pradesh, while the remaining 6% are spread across a further eight states.

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**Chart 41: Indian gold reserves and resources are concentrated in Karnataka and Rajasthan**

![Chart 41](chart41.png)


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Over **99%** of gold mineral reserves are located in the state of Karnataka

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127 Reserves are that part of the reserve base that can be economically produced or extracted at the time of determination.
India’s gold mining industry has been hampered by bureaucracy and under-investment

Despite India being one of the world’s largest consumers of gold, until recently there had been no real policy push to promote domestic mining. A few private and locally-listed companies started up after legislation was passed in 2003 allowing private organisations to apply for mining leases. But it is not an easy market to enter: in some cases, companies have been waiting more than five years for permit approval.

As a result, there has been limited investment in gold exploration over the past decade, particularly from the private sector.

As of March 2013, there were 13 mining leases granted for gold across the whole of India: eight in Karnataka, three in Andhra Pradesh, one in Jharkhand and one in Rajasthan. In 2014, however, mining was only undertaken within three of these permit areas: Huttí, Uti and Hira-Buddinní, all located in Karnataka and operated by Huttí Gold Mines.

While the industry is small, it has potential to grow

Some in India have very high expectations for gold mining. In its 12th five-year plan (2012–17) formulated in 2011, a government of India working group outlined that with adequate investment annual production could be as high as 70t by 2030. While this is unlikely, it does highlight the ambition to grow India’s gold mine production.

As new projects reach their production phase, Indian gold production could grow, albeit from a very low base. Deccan Gold Mines expects to bring its flagship Ganajur Main Project (Karnataka) into production in 2017. With output expected to average 1.6t/yr, the project could double India’s production from current levels. Furthermore, Deccan is in the process of acquiring the Jonnagiri gold project (Andhra Pradesh) from Geomysore Services (India) Private Limited. A mining lease was granted for Jonnagiri in October 2013, and so the project appears likely to add further ounces to Deccan’s future production profile by 2020.

Government has made some progress recently in helping the industry to grow

In May 2016, Parliament approved an amendment to the Mines and Minerals (Development and Regulation) Act 1957 (MMDR), which allowed private companies to bid for mining leases via a competitive auction process and proposed that mining leases for major minerals to be granted for a period of 50 years, compared with the previous 30-year limit. Further amendments were also accepted, under which transfer of captive mining blocks could be allowed without need for auction. Under the initial issue of 43 mining blocks for tender, three are gold mining deposits. In February 2016, London-listed Vedanta resources became the first private company to successfully bid for a gold mine in India – the Baghmara gold mine in Chhattisgarh – a mine with potential gold reserves of 2.7t of contained metal.

The National Minerals Exploration Policy (NMEP), approved in June 2016, is designed to similarly stimulate mining exploration. The policy allows private companies to enter into a transparent bidding process, conducted via e-auction, to carry out exploration of mineral-bearing areas. The company submitting the winning bid would be entitled to a share of the royalty paid to the relevant state government. This policy – aimed at accelerating exploration activity – opens the way for the auction of 100 prospective mineral blocks.

129 The 12th Five Year Plan, Sub-group II, Metals and Minerals, Strategy based upon the demand and supply for Mineral Sector, Mineral Exploration and Development (Other than Coal and Lignite) – Government of India Planning Commission.
130 Deccan Gold Mines (www.deccangoldmines.com)
131 A captive mining block is used to meet the needs of block owner, or of the parent, subsidiary or affiliates of the mine owner and the output from the mining block is not intended for open market sale.
132 http://www.narendramodi.in/cabinet-approves-national-mineral-exploration-policy-498586
More can be done to ensure gold mining reaches its full potential

Although the recent developments bode well in terms of helping India’s mining sector to realise its potential, a number of progressive steps would boost domestic gold production, as well as encourage the wider mining sector.

These include:

Reducing bureaucracy

- State and central government agencies should simplify the permitting process, perhaps with the introduction of a single window clearance system. At present, permitting applications have to be signed off by a large number of departments and different ministries, which can make the processes very lengthy. It is not uncommon for a licence to require approval from at least 15 to 20 different authorities. Reducing the time and paper work required to obtain permits would lower the cost of bringing a new mine into production.

Promoting investment

- The mining sector needs funds to grow. Central and state government should incentivise investment within the sector, as well as ancillary sectors that support the mining industry, such as power and transport, which have also been starved of capital investment.
- Making gold mining a strategic sector and bringing it under the Infrastructure category would provide tax breaks for investors. This would boost rates of return on what are often significant upfront capital investments.
- A Public Private Partnership (PPP) model would help promote rail, port and grid capacity, as has been the case with other infrastructure projects in India, such as roads, metros and airports. This would provide the infrastructure necessary to improve the economics of future mining projects.

Economic impact of gold mining

Gold mining can provide significant sustainable socio-economic development to India. This is not just through the investment required to explore and mine for gold, but also through the legacy of creating a skilled workforce. Furthermore, mining helps bring infrastructure investment to a region, and helps initiate and support associated service industries, all of which often persist long beyond the working life of the mine.

Mining can provide significant employment opportunities to rural areas. Currently, Hutti Gold Mines employs 5,000 skilled workers and contractors, and it is estimated that each of those workers supports around five dependents. Our report, The social and economic impacts of gold mining, published in 2015, showed that 70% of total expenditure by gold producing companies was via payments to local suppliers and contractors, as well as wages to employees. This highlights the important impact even a small gold operation can have on its community.

And given that India is one of the world’s largest gold consuming countries, it makes sense for it to develop mining capacity. For this to happen, changes need to be made. Bureaucracy needs to be reduced and investment encouraged. There are encouraging signs here, with the changes to the MMDR and introduction of the NMEP. If this trend continues, maybe India’s mine production could grow from its current low level.

Hutti Gold Mines employs 5,000 people, and it is estimated that each of those workers supports around five dependents.

133 RBI: As per the expanded definition of infrastructure, this is made up of the following categories: a) energy, b) communication, c) transport, d) water and sanitation, e) mining, exploration and refining, and f) social and commercial infrastructure; various infrastructure sub-sectors are also included within each category.