Indian Minerals Yearbook 2022

(Part- II :Metals and Alloys)

61st Edition

GOLD
(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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8 Gold

Gold in its purest form is a bright, slightly reddish yellow, dense, soft malleable and ductile metal. It is one of the least reactive chemical elements and is solid under standard conditions. Gold often occurs in free elemental (native) form, as nuggets or grains, in rocks, in vein and in alluvial deposits. Gold dissolves in alkaline solution of cyanide, which are used in mining and electroplating. It also dissolves in mercury, forming amalgam alloys, but this is not a chemical reaction. Gold is resistant to corrosion and to most acid and has unique properties distinct from other metals.

Gold is a relatively scarce metal in the world and a scarce commodity in India. The domestic demand is mainly met through imports.

RESERVES/RESOURCES

As per NMI data, based on UNFC system, as on 1.4.2020, the total reserves/resources of gold ore in the country have been estimated at 518.23 million tonnes. Out of these, 23.72 million tonnes were placed under Reserves category and the remaining 494.50 million tonnes under Remaining Resources category. The total reserves/resources of gold (primary), in terms of metal stood at 607.26 tonnes. Out of these, 92.76 tonnes were placed under Reserves category and 514.50 tonnes under Remaining Resources category. The resources include placer-type gold ore in Kerala estimated at 26.12 million tonnes containing 5.86 tonnes gold metal.

By States, largest resources in terms of gold ore (primary) are located in Bihar (43%) followed by Rajasthan (24.92%), Karnataka (20%),West Bengal (2.47%) & Andhra Pradesh (3.03%) and Jharkhand (2%). The remaining 5.22% resources of ore are located in Chhattisgarh, Madhya Pradesh, Kerala, Maharashtra and Tamil Nadu.Although, Bihar is the leading State in India as far as resources of gold ore are concerned. However, the resource estimate are at preliminary stage and falls under Inferred (333) and Reconnaissance (334) categories. In terms of metal content, Karnataka remained on top followed by Rajasthan, Andhra Pradesh, Bihar, Jharkhand, etc. (Table-1).

EXPLORATION & DEVELOPMENT

The exploration and development details, if any, are covered in the Review on Exploration & Development under "General Reviews".

PRODUCTION & PRICES

The production of gold ore at 491 thousand tonnes during 2021-22 increased by 12% as compared to that in the previous year. The quantity of ore treated also increased from 482 thousand tonnes from 456 thousand tonnes as compared to previous year. there were six reporting mines of gold ore in 2021-22.

The average grade of gold ore produced in india during 2021-22 was 3.20 G/T as against 3.16 G/T in previous year where as that of gold treated was 2.88 G/T in 2021-22 as compared to 2.76 G/T in the previous year.

Production of primary gold in 2021-22 at 1,251 kg increased by 11% as compared to that in the previous year.

Karnataka was the leading producer of gold accounting for 99% of the total production. The remaining production was reported from Jharkhand.

The average daily employment of labour in 2021-22 was 3,086 as against 3,247 in the previous year.

Production of gold by, HINDALCO a subsidiary of (Aditya Birla Group) as extracts from imported copper concentrates has been reported. During the process of copper refining, gold and other precious metals like silver and selenium are also recovered at the plant located in Dahej, district Bharuch, Gujarat.

Table – 1:Reserves/Resources of Gold as on 1.04.2020 (P)
(By Grades/States)

(In tonnes)

States/Grades	Reserves				Remaining Resources								Total Resources (A+B)
	Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	
	STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	
All India:Total													
Ore (Primary)	20271400	3420000	36700	23728100	4498133	3821500	1741321	9658248	109446798	238863938	126476333	494506270	518234370
Metal (Primary)	79.26	13.44	0.06	92.76	16.93	9.11	5.64	22.05	159.41	236.26	65.1	514.5	607.26
Ore (Placer)	-	-	-	-	-	-	-	-	2552000	23569000	-	26121000	26121000
Metal (Placer)	-	-	-	-	-	-	-	-	2.29	3.57	-	5.86	5.86
By States													
Andhra Pradesh													
Ore (Primary)	3221400	-	36700	3258100	2485133	1857500	1548115	291000	55000	6236150	-	12472898	15730998
Metal (Primary)	5.24	-	0.06	5.3	11.87	3.99	4.92	1.08	0.17	19.84	-	41.87	47.17
Bihar													
Ore (Primary)	-	-	-	-	-	-	-	-	-	128884860	94000000	222884860	222884860
Metal (Primary)	-	-	-	-	-	-	-	-	-	21.6	16.0	37.6	37.6
Chhattisgarh													
Ore (Primary)	-	-	-	-	-	-	-	-	600000	4241033	-	4841033	4841033
Metal (Primary)	-	-	-	-	-	-	-	-	1.8	3.71	-	5.51	5.51
Jharkhand													
Ore (Primary)	-	-	-	-	-	-	19206	-	4710966	4579355	767000	10076527	10076527
Metal (Primary)	-	-	-	-	-	-	0.08	-	2.24	12.49	0.62	15.43	15.43
Karnataka													
Ore (Primary)	17050000	3420000	-	20470000	2013000	1964000	174000	4304968	46495718	21773820	5813000	82538506	103008506
Metal (Primary)	74.02	13.44	-	87.46	5.06	5.12	0.64	14.13	44.17	48.91	45.68	163.71	251.17

(contd)

Table - 1 (concld)

Grades/States	Reserves				Remaining Resources								Total Resources
	Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnsaissance	Total	
	STD111	STD121	STD122	(A)	STD221	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Kerala													
Ore (Primary)	-	-	-	-	-	-	-	462280	96180	-	-	558460	558460
Metal (Primary)	-	-	-	-	-	-	-	0.17	0.03	-	-	0.2	0.2
Ore (Placer)	-	-	-	-	-	-	-	-	2552000	23569000	-	26121000	26121000
Metal (Placer)	-	-	-	-	-	-	-	-	2.29	3.57	-	5.86	5.86
Madhya Pradesh													
Ore (Primary)	-	-	-	-	-	-	-	-	5745934	1947000	-	7692934	7692934
Metal (Primary)	-	-	-	-	-	-	-	-	6.03	2.22	-	8.25	8.25
Maharashtra													
Ore (Primary)	-	-	-	-	-	-	-	-	-	1627000	-	1627000	1627000
Metal (Primary)	-	-	-	-	-	-	-	-	-	3.64	-	3.64	3.64
Rajasthan													
Ore (Primary)	-	-	-	-	-	-	-	4600000	51743000	69507720	63000	125913720	125913720
Metal (Primary)	-	-	-	-	-	-	-	6.67	104.97	122.85	0.07	234.56	234.56
Tamil Nadu													
Ore (Primary)	-	-	-	-	-	-	-	-	-	67000	-	67000	67000
Metal (Primary)	-	-	-	-	-	-	-	-	-	1	-	1	1
West Bengal													
Ore (Primary)	-	-	-	-	-	-	-	-	-	-	12833333	12833333	12833333
Metal (Primary)	-	-	-	-	-	-	-	-	-	-	0.65	0.65	0.65

Figures rounded off.

Table – 2: Principal Producers of Gold, 2021-22

Name and address of the producer	Location of the mine	
	State	District
The Hutti Gold Mines Co. Ltd, Hutti, Dist. Raichur 584 115, Karnataka.	Karnataka	Raichur
Manmohan Industries (P) Ltd, Shanti Niketan, 286, New Patliputra Colony, Patna, Bihar.	Jharkhand	Saraikel; Kharasw

Table – 3: Production of Gold Ore 2020-21 and 2021-22 (By States)

(In tonnes)

State	2020-21		2021-22 (P)	
	Ore Produced	Avg. Grade (g/t)	Ore Produced	Avg. Grade (g/t)
India	**437669**	**3.16**	**491160**	**3.2**
Andhra Pradesh	-	-	849	1.2
Jharkhand	2859	4.19	3682	3.5
Karnataka	434810	3.16	486629	3.2

(p): Provisional

Table – 4: Gold Ore Treated 2020-21 and 2021-22 (By States)

(In tonnes)

State	2020-21		2021-22 (P)	
	Ore Treated	Avg. Grade (g/t)	Ore Treated	Avg. Grade (g/t)
India	**456217**	**2.76**	**4822324**	**2.88**
Andhra Pradesh	-	-	9	5.54
Jharkhand	2880	4.20	3682	3.51
Karnataka	453337	2.75	478633	2.88

(p): Provisional

Table – 5: Production of Gold, 2020-21 to 2021-22 (By States)

(Quantity in kg; Value in ₹'000)

State	2019-20		2020-21		2021-22 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	**1742**	**6495723**	**1126**	**5475950**	**1251**	**6011677**
Primary Gold	1742	6495723	1126	5475950	1251	6011677
Jharkhand	18	64689	11	53790	12	56268
Karnataka	1724	6431034	1115	5422160	1239	5955409

Table – 6: Production of Primary Gold, 2020-21 and 2021-22
(By Sectors/States/Districts)

(Quantity in kg; Value in ₹'000)

State/District	No. of mines	2020-21		No. of mines	2021-22 (P)	
		Quantity	Value		Quantity	Value
India	**5**	**1127**	**5475470**	**6**	**1251**	**6011677**
Public Sector	3	1116	5422160	4	1239	5955409
Private Sector	**2**	**11**	**53310**	**2**	**12**	56268
Primary Gold	**5**	1127	5475470	6	**1251**	**6011677**
Andhra Pradesh	1*	-	-	1	-	-
Kurnool	1*	-	-	1	-	-
Jharkhand	**1**	**11**	**53310**	**1**	**12**	**56268**
Saraikela kharasawan	**1**	**11**	**53310**	1	**12**	56268
Karnataka	**3**	**1116**	**5422160**	4	**1239**	**5955409**
Raichur	3	**1116**	**5422160**	**4**	1239	5955409

**: only labour reported*

(p): provisional

Gold Bullion

Production of gold bullion in India is reported both in primary and secondary forms and includes gold recovered from imported copper concentrates. Total production of gold bullion during 2021-22 at 9931 kg increased by 34% as compared to 7387 kg in the previous year. (Table -7). The prices of gold are covered in the Review on "Prices" under General Review.

Table – 7: Production of Gold Bullion
2020-21 to 2021-22

(Quantity in kg; Value in ₹'000)

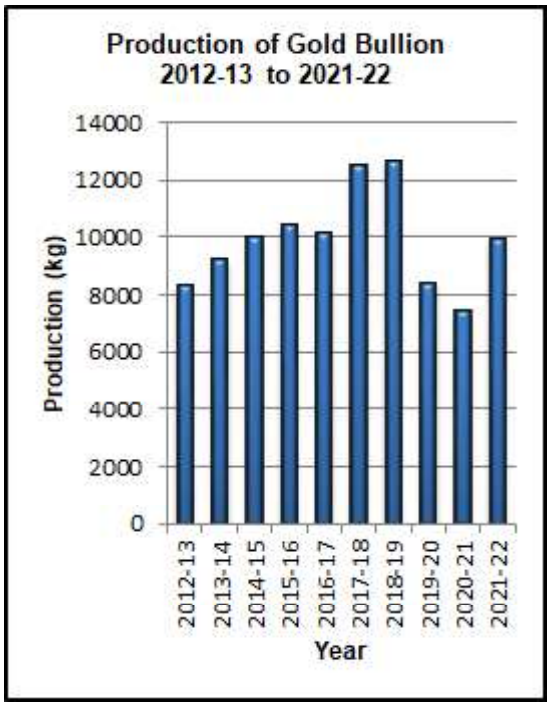
Year	Quantity	Value
2019-20	8382	31283423
2020-21	7387	35814249
2021-22 (P)	9931	47676677

Note: *Includes gold recovered as by-product from copper concentrates by Hindalco Industries Ltd in Gujarat.*

MINING & MILLING

Presently, HGML is the only Public Sector Company producing gold in the country. While in the Private Sector, Manmohan Mineral Industries Pvt. Ltd is engaged in mine production of gold at Kunderkocha in Singhbhum East district, Jharkhand by underground method of mining. Geomysore Services (India) Pvt. Ltd has been granted a mining lease over an area of 597.82 ha for gold mining in Village Jonnagiri in Kurnool district of Andhra Pradesh. HGML operates mines at Hutti and Hira-Buddini in Raichur district, Karnataka. Sub-level and LDBH stoping methods are adopted in exploitation of gold ore. In the Uti mine, mining was carried out by opencast method till the year 2006 and thereafter by underground method. The ore from this mine is transported to Hutti mine by road for processing at the mills. Underground exploratory mining too is in progress. Several operations at Hira-Buddini old unit, such as, exploratory mine development and deepening and re-equipping of main shaft are in progress. Exploratory mine development using compressed air jackhammer drilling and electrical hoist in the shaft is presently underway. Based on the developmental work and feasibility, the locomotive loaders, wagon drills and other required machinery are likely to be used to increase the ROM.

The new ore processing plant based on modern technology (SAG and Ball Mill) with a capacity of 2,000 TPD has been operational at Hutti underground gold mine since 2010. At the Hutti Mineral Treatment Plant, the r.o.m. of -8" size is crushed. The final product from crushing plant, i.e. -10 mm size is stored in a 1,500 tonnes capacity fine ore bin for subsequent treatment, i.e., grinding. The Milling/Grinding process of gold ore employs two distinct grinding techniques. The first technique involves grinding done in two stages, i.e., primary grinding followed



by secondary grinding for adequate comminution. The processes involve one primary mill and three tube mills which constitute one stream of grinding in which pebbles and smaller size balls are used as composite grinding media.

There are two such streams and strake tables for collection of coarse gold as concentrate for this circuit. In the second technique, grinding is done by four ball mills of different sizes and each of them is an independent circuit in which large size balls are used as grinding media. In these circuits, Knelson concentrator is used to collect coarse gold as concentrate. In all the milling techniques, cyclones are in closed circuit with the mills so as to get the required sizes (80% passing 75 micron) for the subsequent treatment process.

The concentrate collected from both the techniques is upgraded on James Table. The upgraded concentrates are roasted, magneted and finally smelted into bullion buttons.

All the cyclone overflow, i.e., finely-ground ore in the form of slurry from the two streams of first technique and 4 streams of second technique join together in a distributor box from which finely-ground ore slurry is fed to High Rate Thickener for thickening purpose. The thickened pulp (60% solid w/w) thus obtained from thickeners is subjected to cyanidation process in which cyanide accessible gold in slurry makes complexes with cyanide in presence of oxygen and dissolves in solution at high pH. To increase the oxygen potential of slurry, H_2O_2 is added in addition to compressed air. The cyanidation or leaching process is carried out in a series of mechanically agitated agitators of different sizes.

The cyanide leached pulp is then fed to two Carbon-in Pulp (CIP) plants. The CIP plants are of 1,000 tpd size each and are parallel in circuit. The objective of CIP plant is to absorb the dissolved gold in activated carbon from the solution.

The gold-loaded carbon is removed from the CIP plant periodically, subjected to acid and alkaline wash and then eluted in four elution columns with 1.0% NaOH and 0.1% NaCN solution at 95 ^{0}C for a period of 60 hours. The solution is then passed through four electrowinning cells in which gold is deposited on steel wool cathodes. The gold loaded steel wool cathodes are manually removed periodically and subsequently subjected to acid digestion, drying and smelting to obtain bullion buttons. The bullion buttons thus obtained from table concentrate and steel wool are cast into bullion bars weighing 4 to 11 kg and then despatched for sales.

In the past, gold was produced by the Central Government undertaking, namely, BGML. BGML earlier mined and processed the ore from Chigargunta reef in Chittoor district, Andhra Pradesh; Mysore Mines of Kolar Gold Fields in Karnataka; and Yeppamana mine in Anantapur district, Andhra Pradesh. All activities of BGML were stopped and BGML was closed w.e.f. 1.3.2001 under Section 25 (O) of the Industrial Disputes Act, 1947 in terms of Ministry of Labour, Government of India's Order dated 29.1.2001.

Gold is sometimes recovered from the pregnant (Simple gold-bearing solution) solutions by adding zinc to form soluble zinc cyanide and precipitate of gold & silver. The pregnant solution can also be passed through activated carbon which absorbs dissolved gold. Gold from either process is cast into bars, bullion and dore (when it contains silver), which must be further refined to remove impurities, such

as, mercury, arsenic and copper. Some ores cannot be treated by cyanide processing as gold in them is in small inclusions or even by solid solutions in minerals, such as, pyrite. This gold is generally recovered by roasting which converts pyrite into porous iron oxides containing small grains of gold that can be dissolved by cyanide.

DEVELOPMENT

The Deccan Gold Mines Ltd (DGML) is listed gold exploration company with deep roots in the Exploration and Mining sector. DGML's exploration activities are mainly in Karnataka and Andhra Pradesh States. Within the States of Karnataka, Andhra Pradesh and Kerala, DGML has explored several regions spanning 6,574 sq. km. in Dharwar-Shimoga Greenstone belt, Hutti-Maski Greenstone Belt, Mangalur Schist Belt and Ramagiri Schist Belt.

The main prospects for gold at Ganajur and Karajgi have progressed into advanced stages of exploration and existence of high-grade gold-bearing zones in the prospect have been established. DGML has entered into MoU with Government of Karnataka to establish a Gold Mining industry in this project area.

Exploration is being conducted in Hutti belt at various prospects, viz, in Hutti Mine north prospect, Hirenagnur prospect, southern & northern continuity of Uti mine lodes, Uti Temple prospect, Chinchergi prospect, Buttapur prospect and Yatkal prospect. In south Hutti RP block, investigations are going on in Tuppadhur-Buddini prospect, Maski prospect, Ashoka prospect and Sanbal prospect.

Birla Copper Complex of Hindalco Industries Ltd situated at Dahej, district Bharuch, Gujarat has an installed capacity of 15 tpy for gold recovery from imported copper concentrates.

HCL which recovers by-product secondary gold from indigenous copper ores at its ICC plant in Jharkhand has an installed capacity of 698 kg per annum gold recovery plant. This plant, however, did not reported production since 2007-08.

NMDC has secured a Bulyang / 'Ombe gold prospect in Tanzania. The gold prospect has a total area of 38.83 sq.km. Initial studies of NMDC revealed that Bulyang'Ombe I had a prospect for good concentration where gold values have shown a maximum of 7.2 gram per tonne, which is close to the top quality standard of 8 to 10 gram per tonne set by the World Gold Council.The Company is in process of setting up of a pilot-scale processing plant for gold in Tanzania.

NMDC has submitted the proposal for Bhukia Gold block to DMG, Govt. of Rajasthan, for over an area of 24 sq. km in Dist. Banswara. The Company has been allocated 3 Gold blocks, 2 in Karnataka and 1 in Madhya Pradesh.

Legacy Iron Ore Ltd (NMDC holding 90.05% equity stake) based in Perth, Australia is concentrating in exploration of gold in Mount Ceila where good occurrence of gold is observed. Mount Celia gold project has identified two gold occurrences, namely, Kangaroo Bore and Blue Peter deposit. Currently exploration drilling and mining study is being carried out to get the confidence & complete the feasibility study.

In Jharkhand, NMDC has submitted application to DMG, Jharkhand, for proposal to reserve 24.80 sq. km area in Kuchai Tehsil, District - Saraikela - Kaswan, Jharkhand under Section 17A (2A) of MM(D&R) Amendment Act, 2015 for prospecting and mining operation of gold & associated minerals. The matter is being pursued by NMDC with Govt. of Jharkhand for reservation.

NMDC has applied for Peravali-Betapalli Block for gold. NMDC has requested the Government of Andhra Pradesh to reserve the block in favour of NMDC under 17A (2A) of MM (D&R) Amendement Act, 2015 for prospecting & mining.

NMDC has been allotted 3 gold blocks (2 in Karnataka & 1 in Madhya Pradesh) by Ministry of Mines, for G4 level exploration under NMET. NMDC has completed exploration of 5 blocks and submitted Geological Report to NMDC.

NMDC has applied for prospecting of various minerals (diamond, gold, PGE, nickel, etc.) in Jabalpur, Katni Block (563 sq. km). Tripartite MoU among GoMP (MRD, through DGM) MPSMCL & NMDC was signed for geological and geophysical exploration for various districts of Madhya Pradesh.

A committee on Transforming India's Gold Market was constituted by NITI Aayog to recommend measures for Transforming the Gold Market Ecosystem in the country. The major recommendations of the committee are structured into five key areas. These are Make in India Gold, finalisation of Gold, Tax and duty structure, Regulatory Infrastructure and Skill Development & Technology Upgradation.

The Recommendations of the Committee are summarised as follows:

Gold Mining

1. Make gold mining viable and attractive to investors by promoting ease of doing business with single window clearances.

2. Government may consider making available the risk capital for long-term capital-intensive mining projects to attract investments.

3. The mining policy should consider availability of suitable exit option. Aspects related to brownfield exploration may also be considered.

4. Improve the quality and availability of digital data, covering geological database (which includes quality and scale of maps and ease of access to informations).

5. A comprehensive taxation policy should be formulated to align India's taxation framework with the strategic needs of the gold mining sector.

POLICY

Foreign Direct Investment (FDI) up to 100% in Mining Sector has been allowed.

In the revised Export-Import Policy, comprised in the Foreign Trade Policy (FTP), 2015-20, gold ores and concentrates are under freely importable category. Under Heading No.7108, the import of non-monetary gold metal also falls under Free category subject to RBI regulations, while import of gold metal in monetary form is restricted.

ENVIRONMENTAL CONCERNS

Gold is recovered from ores by two main methods, both of which affect environment. Earlier, for recovery of gold, amalgamation processes were used in which ore was mixed with mercury that selectively dissolved gold which was then recovered by evaporation. Mercury from these operations was never recovered and remained as pollutant in many old mining areas. The cyanide process is based on the property of precious metals in forming soluble complex ions with cyanide anion. Cyanide does not dissolve quartz, iron oxides and other common gangue minerals and yields a relatively simple gold-bearing solution known as pregnant solution. In some gold mines, gold is dissolved from the ore by crushing and grinding followed by mixing with cyanide solution in large vats.

Cyanide is a highly toxic compound and requires special handling. During ore treatment, pH of cyanide solution must be kept at about 11 to prevent cyanide from reacting with hydrogen ion to produce HCN, a deadly gas. Although less toxic substitutes of cyanide are known, it is not yet clear whether such substances will be cost-effective or environment-friendly.

DEMAND & CONSUMPTION

Jewellery accounted for major consumption of gold. The Industrial demand especially in the Electrical Sector for gold is mainly due to excellent thermal and electrical properties. Besides, a significant amount is consumed in dentistry and medicine. Continuing research has discovered new applications for gold as catalyst and in nano-technology. There is increase in demand from Ornamental and Electronic Sectors. Gold is considered a valuable asset, for investments and bank reserves.

SUBSTITUTES

Platinum and palladium substitute gold to some extent, but their use is influenced by price relationship and by an established consumer preference for gold. Silver can be a substitute, but it offers less resistance to corrosion. Gold-plated palladium and bright tin-nickel can be used in electronics. Titanium and chromium-based alloys can be used in dental work. High prices encourage substitutes, particularly base metal clad with gold in Electronic & Electrical Industry and in jewellery products. No metal or alloy substitute has all the properties of gold, and therefore, the emphasis is only on reduction of gold content rather than substitution.

WORLD REVIEW

The estimated world reserves of gold were about 52,000 tonnes of metal content. The gold reserves are mainly located in Australia, Russia, South Africa, USA, Indonesia, Brazil and Peru. The world reserves of gold are provided in Table-8.

The world mine production of gold was estimated at 3,282 tonnes in 2021 as compared to the 3,188 tonnes in the preceding year. China contributed about 10% to the world's total mine production of gold followed by Russia (10%), Australia (9%), Canada (8%), USA (6%), , Maxico (4%) & Kazakhstan (3%) and South Africa & Usbekistan (3% each) (Table-9).

Table – 8: World Reserves of Gold (By Principal Countries)

(In tonnes of gold content)

Country	Reserves
World: Total *(rounded off)*	**52,000**
Australia	118400
Brazil	2400
Burkina Faso	NA
Canada	2300
China	1900
Colombia	NA
Ghana	1000
Indonesia	2600
Kazakhstan	1000
Mexico	1400
Papua New Guinea	1100
Peru	2900
Russia	6800
South Africa	5000
Sudan	NA
Tanzania	NA
USA	3000
Uzbekistan	1800
Other countries	9200

Source: *USGS, Mineral Commodity Summaries, 2022.*

(a) For Australia, Joint Ore Reserves Committee-compliant reserves were 4,000 tonnes.

Table – 9: World Mine Production of Gold (By Principal Countries)

(In tonnes)

Country	2019	2020	2021
World:Total *(rounded off)*	**3330**	**3188**	**3282**
China[(d)]	380	365	329
Russia	305	308	313
Australia	326	327	311
Canada	183	182	222
USA	200	190	187
Mexico	133	110	124
Kazakhstan	106	116	114
South Africa	105	95	105
Usbekistan	93	100	105
Other countries	1459	1361	1468

Source: *BGS, World Mineral Production, 2017-2021.*

(d):-Metal production

The top five leading gold-producing countries were China, Australia, Russia, USA and Canada.

To give a generalised view of the development in various countries, countrywise description as sourced from latest available publication of U.S. Geological Survey Minerals Yearbook - 2018 is furnished below:

Australia.

In 2018, gold production in Australia was 315,100 kg, a 7% increase from 2017 and the sixth consecutive year of increased gold production. Some of the production increase was from Newcrest's Cadia Hill Mine, which increased production by 38% from the previous year (23,400 kg) owing to higher grades and throughput. AngloGold Ashanti Ltd. reported an increase of 12% compared with that in 2017, producing about 19,400 kg. The Sunrise Dam Mine produced 8,990 kg of gold, a 21% increase compared with 2017 production owing to higher mined grades in the first and fourth quarters. Production at the Tropicana Mine, a joint venture between Anglo Gold (70%) and Independence Group NL (30%), increased by 5% to 10,500 kg of gold in 2018 owing to higher grades and throughput. Kirkland Lake Gold Ltd.'s Fosterville Mine produced 11,100 kg of gold in 2018, a 35% increase in production compared with the previous year, as a result of higher ore grades mined.

Canada

Reported gold mine production increased by 9% in 2018 to 183,047 kg, mainly because it was the first full year of operation at the Brucejack and Rainy River Mines. Pretium Resources Inc.'s Brucejack Mine produced 11,700 kg of gold in 2018 and New Gold's Rainy River Mine produced 7,070 kg of gold. This increase partially offset Agnico Eagle Mines Ltd.'s Meadowbank Mine, which produced 7,750 kg of gold in 2018, 29% less than 2017 production owing to reduced output as the mine transitioned through its final full year of open pit mining operations.

China

Reported gold production in 2018 was 401,119 kg. While China's efforts to reduce the environmental impact of the mining industry resulted in a production decrease of 6%, it continued to be the world's leading gold producer in 2018. China's gold consumption (excluding central bank purchases) was

998 t in 2018, essentially unchanged from that in 2017, after 4 consecutive years of decline. Chinese jewelry fabrication (including the use of scrap) accounted for 69% of the country's annual gold consumption at 688 t, a slight increase compared with that in 2017. This was the first consumption growth since 2013 as the demand was fostered by the market's preference for pure gold items. Gold investment demand in China was 213 t, a 3% decrease from the previous year and the second consecutive year of decline owing to fluctuations in the yuan currency. China's scrap supply in 2018 was 222 t, essentially unchanged from that in 2017.

Indonesia

In 2018, gold production, excluding illegal artisanal and small-scale gold mining, was an estimated 135,000 kg, 34% more than that in 2017. Freeport-McMoRan Inc.'s (FCX) Grasberg Mine accounted for about 60% of gold production in Indonesia. Gold production at the Grasberg copper mine increased by 74% in 2018 to 83,900 kg owing primarily to higher milling rates and increases in gold ore grades. In December 2018, the Indonesian Government granted FCX a new special mining license which granted their subsidiary, PT Freeport Indonesia, an extension of mining rights through 2031, as well as rights to extend through 2041.

Russia

In 2018, gold production was about 311,000 kg, an increase of 15% from the previous year. A large portion of the increase was from Polyus operations, which reported a 10% increase in gold production owing to the Natalka Mine completing its first full year in operation, and increased production at the Olimpiada, the Verninskoye, and the Kuranakh Mines.

South Africa

In 2018, gold production was 117,200 kg, 15% less than output in 2017. Sibanye Gold Ltd. operations in South Africa included the Beatrix, Cooke, Driefontein, and Kloof Mines, as well as interest in surface tailings retreatment facilities located from the East Rand to the West Rand via their 38.05% stake in DRDGOLD Ltd. Production in 2018 was about 36,600 kg of gold, 16% less than 2017 production. The primary reasons for the decrease were due to the impact of two separate safety incidents at Sibanye's Driefontein and Kloof operations that resulted in the death of 12 employees, operational disruptions including power disruption to the Beatrix operations, and seismic damage to infrastructure at the Driefontein and Kloof Mines. Gold Fields Ltd.'s South Deep Mine produced 4,890 kg, 44% less than that in 2017 because of large-scale restructuring, operational difficulties, and a 6-week strike.

FOREIGN TRADE

Exports

During the year 2021-22, the exports of gold ores & conc was Nil as compared to the negligible as in preceding year. Export of gold-clad metals/base metals, NES was negligible during the years i.e 2021-22 & 2020-21. Out of the total exports of gold (Non-monetary & Monetary), the share of Non-monetary was maximum while the share of Monetary was negligible. The exports of gold (Non-monetary) decreased by 126 kg in 2021-22 from 4191 kg in 2020-21. The exports in 2021-22 were to Hong Kong (40%) followed by UAE (35%), Switzerland (16%) and negligible quantities to Guinea, Canada and Peru . (Tables- 10 to 17).

Imports

Imports of gold ores & concentrates increased manifolds to 799178 kg during 2021-22 from 10742 kg, in the preceding year. On the other hand imports of gold (Non-monetary), powder was negligible levels in 2021-22. Negligible imports of gold-clad metal in the year 2021-22 were reported. Imports of total gold (Monetary and Non-monetary) increased substantially by 35% to 879010 kg in 2021-22 from 651238 kg in 2020-21. Out of the total imports of gold (Non-monetary & Monetary) the share of Non-monetary was cent per cent. The share of Non-monetary: Other Unwrought forms, was at 868489 kg. Imports of gold (Non-monetary & Monetary: total) were mainly from Switzerland (41%), UAE (11%), Guinea (7%), South Africa (6%), and Peru (5%) (Tables-18 to 24).

Table – 10 : Exports of Gold: Total (Non-monetary & Monetary) (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**4191**	**18895717**	**126**	**463986**
Switzerland	3124	14175874	21	85874
Turkey	1048	4637250	-	-
Guinea	9	37872	5	19197
U Arab Emts	7	31523	44	147769
Hong Kong	3	11939	51	206709
Peru	-	-	2	3664
Nepal	-	-	++	482
USA	++	233	++	116
Canada	-	-	3	94
Jordan	-	-	++	83
Other countries	++	1026	-	-

Figures rounded off

Table – 11: Exports of Gold (Non-monetary) (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**4191**	**18895692**	**126**	**463986**
Switzerland	3124	14175874	21	85874
Turkey	1048	4637250	-	-
Guinea	9	37872	5	19197
U Arab Emts	7	31523	44	147769
Hong Kong	3	11939	51	206709
USA	++	208	++	116
Peru	-	-	2	3662
Nepal	-	-	++	482
Canada	-	-	3	94
Jordon	-	-	++	83
Other countries	++	1026	-	-

Figures rounded off

Table – 12: Exports of Gold, (Non-monetary) : Other Unwrought Forms (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**4191**	**18894458**	114	423280
Switzerland	3124	14175874	21	85874
Turkey	1048	4637250	-	-
Guinea	9	37872	5	19197
U Arab Emts	7	31523	35	107838
Hong Kong	3	11939	51	206709
Peru	-	-	2	3662

Figures rounded off

Table – 13 : Exports of Gold - Monetary (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**++**	**25**	**-**	**-**
USA	++	25	-	-

Figures rounded off

Table – 14: Exports of Gold-clad Metals/ Base Metals, NES (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**++**	**306**	++	770
Nigeria	-	-	++	663
Nepal	-	-	++	54
Kenya	-	-	++	22
UK	-	-	++	11
Ireland	-	-	++	2
Sudan	++	263	-	-
Zambia	++	43	-	-

Figures rounded off

Table – 15 : Exports of Gold Ores & Conc. (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	++	1	-	-
Spain	++	1	-	-

Figures rounded off

Table – 16 : Exports of Gold, Non-Monetary, Powder (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	++	16	++	565
Nigeria	++	16	-	-
Nepal	-	-	++	482
Jordan	-	-	++	83

Figures rounded off

Table – 17 : Exports of Gold, Non-monetary, Other Semi-manufactured Forms (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	++	1218	12	40141
Netherlands	++	946	-	-
USA	++	208	++	116
UK	++	24	-	-
Australia	++	22	-	-
Mauritius	++	18	-	-
UAE	-	-	9	39931
Canada	-	-	3	94

Figures rounded off

Table – 18: Imports of Gold (Non-monetary & Monetary): Total (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**651238**	**2542884698**	**879010**	**3440928249**
Switzerland	275265	1193849372	359825	1545226314
UArab Emts	70583	309169370	99757	434899095
South Africa	43020	187099143	57080	243116207
Peru	31429	110557375	50490	172458876
Guinea	26173	105177080	61498	247595230
Singapore	21364	92859048	14764	63499660
USA	20918	87412294	16306	58695275
Bolivia	20626	85098064	38122	153892235
Ghana	16018	66154120	19385	78410163
Australia	23596	43682461	15602	67245208
Other countries	116009	259922310	146181	375889986

Figures rounded off

Table – 19 : Imports of Gold, Non-monetary (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**651238**	**2542884698**	**879010**	**3440928249**
Switzerland	275265	1193849372	359825	1545226314
UAE	70583	309169370	99757	434899095
South Africa	43020	187099143	57080	243116207
Peru	31429	110557375	50490	172458876
Guinea	26173	105177080	61498	247595230
Singapore	21364	92859048	14764	63499660
USA	20918	87412294	16306	58695275
Bolivia	20626	85098064	38122	153892235
Ghana	16018	66154120	19385	78410163
Australia	23596	43682461	15602	67245208
Other countries	102246	261826371	146181	375889986

Figures rounded off

Table – 20 : Imports of Gold, Non-monetary: Other Semi-manufactured Forms (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**1864**	**7902576**	**10521**	**45336972**
USA	1003	4070158	1927	8030919
UAE	429	2015678	8020	34958901
U K	150	727309	54	232815
Singapore	88	408927	2	14768
Hong Kong	69	292488	339	1474200
Germany	72	164976	91	225075
Spain	21	94382	69	312230
Italy	21	88835	12	54839
Korea Rp	++	2474	2	7401
Colombia	3	11198	3	14420
Other countries	8	26151	2	11404

Figures rounded off

Table – 21 : Imports of Gold, Non-monetary: Other Unwrought Forms (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**649374**	**2534982071**	**868489**	**3.396E+09**
Switzerland	275265	1193849372	359825	1.545E+09
UAE	70154	307153692	91737	399940194
South Africa	43020	187099143	57080	243116207
Peru	31429	110557375	50490	172458876
Guinea	26173	105177080	61498	247595230
Singapore	21276	92450121	14762	63484892
Bolivia	20626	85098064	38122	153892235
Australia	23595	43680096	15602	67242385
Ghana	16018	66154120	19385	78410163
Brazil	4682	19052891	12917	50882361
Other countries	117136	324710117	147071	373342415

Figures rounded off

Table – 22 : Imports of Gold Ores & Conc. (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**10742**	**48481**	**799178**	**2376524**
Columbia	10546	26319	798712	2320786
Peru	196	22162	466	55738

Figures rounded off

Table – 23 : Imports of Gold, Non-monetary, Powder (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**++**	**51**	**++**	**5**
UK	++	45	-	-
USA	++	6	++	5

Figures rounded off

Table – 24 : Imports of Gold-clad Metal / Base Metals, NES (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	**++**	**1694**	**++**	**52**
UK	++	1694	-	-
Singapore	-	-	++	52

Figures rounded off

FUTURE OUTLOOK

Historically, purchase of gold was consider to be a safe haven, hedge against economic failures, portfolio diversifier and store of wealth.

India is a traditional and stable market for gold consumption. The present production of gold is insufficient and does not meet the ever increasing demand. Therefore, efforts will be required to reduce the gap between production and demand.

The recommendations of the Committee on Transforming India's Gold Market (Constituted by NITI Aayog) contributes for fulfilling the transformational vision for India's gold market seeking to double its contribution in GDP and more than double the exports of gold by 2022, enhance employment opportunities, increase FDI inflow and increase the gold market size, without negatively impacting upon India's Current Account Deficit.

Further, to reduce dependence on gold imports, it is necessary to boost domestic supply which has to happen through the 'Make in India' initiative for mining, recycling & refining and increased monetisation. The policies around gold mining may need to be revisited with regard to the auctioning process, providing for single window clearance for the pending proposals and increasing co-operation between the States and the Centre.