Indian Minerals Yearbook 2018

(Part- II :Metals and Alloys)

57th Edition

GOLD

(FINAL 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 is dissolved in alkaline solution of cyanide, which are used in mining and electroplating. It dissolves in mercury, forming amalgam alloys, but this is not a chemical reaction. Gold is resistant to corrosion and their chemical reactions and its distinctive colour.

Gold is a relatively scarce metal in the world and a scarce commodity in India. The domestic demand is mainly met through imports. The consumption of gold produced in the world is about 50% in jewellery, 40% in investment, and 10% in industry.

RESERVES/RESOURCES

As per NMI data based on UNFC system, as on 1.4.2015, the total reserves/resources of gold ore in the country have been estimated at 501.83 million tonnes. Out of these, 17.22 million tonnes were placed under reserves category and the remaining 484.61 million tonnes under remaining resources category. The total reserves/resources of gold (primary), in terms of metal stood at 654.74 tonnes. Out of these, 70.09 tonnes were placed under reserves category and 584.65 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 (44%) followed by Rajasthan (25%), Karnataka (21%),West Bengal (3%), Andhra Pradesh (3%), Jharkhand (2 %). The remaining 2% resources of ore are located in Chhattisgarh, Madhya Pradesh, Kerala, Maharashtra and Tamil Nadu. 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 given in the review on Exploration & Development in "General Reviews".

PRODUCTION & STOCKS

The production of gold ore at 550 thousand tonnes during 2017-18 decreased by 6% as compared to that in the previous year. The quantity of ore treated also decreased from 575 thousand tonnes to 573 thousand tonnes as compared to previous year. There were five reporting mines of gold ore in 2017-18.

The average grade of gold ore produced in India during 2017-18 was 3.32 g/t as against 3.05 g/t in 2016-17, whereas, that of gold ore treated was 3.18 g/t in 2017-18 as compared to 2.73 g/t in 2016-17.

Production of primary gold in 2017-18 at 1,648 kg increased by 3 % as compared to that in the previous year. In addition, HINDALCO, an Aditya Birla Company, extracts gold from imported copper concentrates. During the process of copper refining, the gold and other precious metals are also recovered at the plant located in Dahej, district Bharuch, Gujarat.

Karnataka was the leading producer of primary gold accounting for 99% of the total production.The remaining production was reported from Jharkhand (Tables- 2 to 6).

The average daily employment of labour in 2017-18 was 3,250 as against 3,451 in the previous year.

Table – 1:Reserves/Resources of Gold as on 1.04.2015
(By Grades/States)

(In tonnes)

State/Grade	Reserves				Remaining Resources								Total Resources (A+B)
	Proved STD111	Probable STD121	Probable STD122	Total (A)	Feasibility STD211	Pre-feasibility STD221	Pre-feasibility STD222	Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
All India:Total													
Ore (Primary)	10404349	6401725	422100	17228174	1925669	1303000	1968176	30333248	70136727	233608305	145336333	484611458	501839632
Metal (Primary)	53.41	16.26	0.42	70.09	7.69	3.85	12.1	128.65	143.8	227.44	61.12	584.65	654.74
Ore (Placer)	-	-	-	-	-	-	-	-	2552000	23569000	-	26121000	26121000
Metal (Placer)	-	-	-	-	-	-	-	-	2.29	3.57	-	5.86	5.86
By States													
Andhra Pradesh													
Ore (Primary)	-	3902725	-	3902725	655133	-	889515	291000	55000	6980031	-	8870679	12773404
Metal (Primary)	-	8.49	-	8.49	2.45	-	3.57	1.08	0.17	23.78	-	31.05	39.54
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)	9349	-	-	9349	-	-	-	-	5146952	4203337	767000	10117289	10126638
Metal (Primary)	0.07	-	-	0.07	-	-	-	-	3.61	10.26	0.62	14.49	14.56
Karnataka													
Ore (Primary)	10395000	2499000	4221000	13316100	1270536	1303000	1078661	24979968	8204595	16020324	37673000	90530084	103846184
Metal (Primary)	53.34	7.77	0.42	61.53	5.24	3.85	8.53	120.73	28.67	38.29	43.78	249.09	310.62

(Contd.)

Table - 1 (Concld.)

Grade/State	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)	-	-	-	-	-	-	-	-	5841000	1947000	-	7788000	7788000
Metal (Primary)	-	-	-	-	-	-	-	-	6.18	2.22	-	8.4	8.4
Maharashtra													
Ore (Primary)	-	-	-	-	-	-	-	-	-	1517000	-	1517000	1517000
Metal (Primary)	-	-	-	-	-	-	-	-	-	3.55	-	3.55	3.55
Rajasthan													
Ore (Primary)	-	-	-	-	-	-	-	4600000	50193000	69747720	63000	124603720	124603720
Metal (Primary)	-	-	-	-	-	-	-	6.67	103.34	123.03	0.07	233.11	233.11
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: Producers of Gold, 2017-18

Name and address of the producer	Location of the mine	
	State	District
The Hutti Gold Mines Co. Ltd, Hutti, Dist. Raichur 584 115 Bengaluru- 560 047, Karnataka.	Karnataka	Raichur
Manmohan Industries (P) Ltd, Shanti Niketan, 286, New Patliputra Colony, Patna, Bihar.	Jharkhand	Singhbhum (East)

Table – 3: Production of Gold Ore 2016-17 and 2017-18 (By States)

(In tonnes)

State	2016-17		2017-18	
	Ore Produced	Avg. Grade (g/t)	Ore Produced	Avg. Grade (g/t)
India	**582280**	**3.05**	**549695**	**3.32**
Jharkhand	5581	2.99	4618	2.09
Karnataka	576699	3.05	545077	3.33

(P): Provisional

Table – 4: Gold Ore Treated 2016-17 and 2017-18 (By States)

(In tonnes)

State	2016-17		2017-18	
	Ore Produced	Avg. Grade (g/t)	Ore Produced	Avg. Grade (g/t)
India	**574732**	**2.73**	**573413**	**3.18**
Jharkhand	5581	2.99	4618	2.09
Karnataka	569151	2.73	568795	3.19

(P): Provisional

Table – 5:Production of Gold, 2015-16 to 2017-18 (By States)

(Quantity in kg; Value in `'000)

State	2015-16		2016-17		2017-18	
	Quantity	Value	Quantity	Value	Quantity	Value
India	**1323**	**3214623**	**1595**	**4362410**	**1648**	**4763056**
Primary Gold	1323	3214623	1595	4362410	1648	4763056
Jharkhand	13	35871	15	45424	8	24986
Karnataka	1310	3178752	1580	4316986	1640	4738070

(P): Provisional

Table – 6: Production of Gold, 2016-17 and 2017-18
(By Sectors/States/Districts)

(Quantity in kg; Value in `'000)

State/District	No. of mines	2016-17		No. of mines	2017-18 (P)	
		Quantity	Value		Quantity	Value
India	**5**	**1595**	**4362410**	**5**	**1648**	**4763056**
Public Sector	3	1580	4316986	3	1640	4738070
Private Sector	2	15	45424	2	8	24986
Primary Gold	**5**	**1595**	**4362410**	**5**	**1648**	**4763056**
Andhra Pradesh	**1***	-	-	**1***	-	-
*Kurnool	1*	-	-	1*	-	-
Jharkhand	**1**	**15**	**45424**	**1**	**8**	**24986**
Singhbhum (East)	1	15	45424	1	8	24986
Karnataka	**3**	**1580**	**4316986**	**3**	**1640**	**4738070**
Raichur	3	1580	4316986	3	1640	4738070

** 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. The total production of gold bullion during 2017-18 at 12,497 kg increased by about 24% as compared to 10,082 kg in the previous year (Table -7).

Table – 7: Production of Gold Bullion
2015-16 to 2017-18

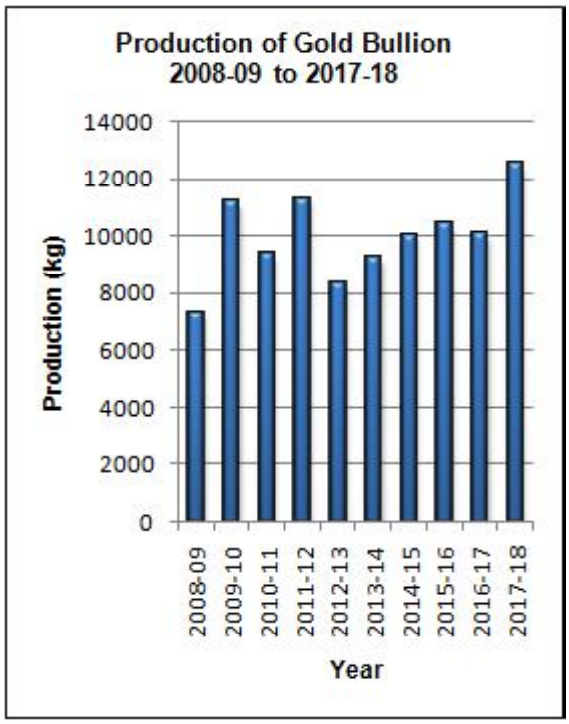
(Quantity in kg; Value in `'000)

Year	Quantity	Value
2015-16	10412	25359408
2016-17	10082	27339280
2017-18 (p)	12497	36011308

(P): Provisional
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 undeground method of mining. The production of ore at this mine was 5,581 tonnes of ore during 2017-18. Geomysore Services (India) Pvt. Ltd has been granted a mining lease for gold mining in Kurnool district of Andhra Pradesh. GMSI has only reported labour for the year 2017-18. HGML operates mines at Hutti and Hira-Buddini in Raichur district, Karnataka. The total installed capacity of Hutti mine is 7 lakh tpy gold ore. Implementation of mechanisation of mining operations at Hutti mine was in progress. The production of ore at the mine was 4,86,560 tonnes @ 3.66 g/t during 2017-18. Sub-level and LDBH stoping methods are used to exploit the 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 will be used to increase the ROM. The combined production of the Uti gold mine and Hira-Buddini Gold mine was 82,132 tonnes of ore during 2017-18.



The new ore processing plant based on modern technology (SAG and Ball Mill) with a capacity of 2000 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 involve grinding that is 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 used to collect 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, 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. To augment gold production in the country, as per XI Plan document, Chigargunta and Bisanthan mines deserve active consideration for opening and commencement of operations.

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 India's first and largest listed gold exploration company. DGML has plans for geophysical studies and drilling prospects at areas located in proximity to existing old mines and also at earlier explored areas in Hutti belt, Mangaluru belt, Dharwad-Shivamogga belt in Karnataka; Attapadi Project in Kerala; and Ramgiri belt in Andhra Pradesh. 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. Exploration is being conducted in Hutti belt at various prospects, viz, in Hutti Mine north prospect, Hirenagnur prospect, southern and northern continuity of Uti mine lodes, Uti Temple prospect, Chinchergi prospect, Buttapur prospect and Yatkal prospect. In south Hutti RP block, the investigations are going on in Tuppadhur-Buddini prospect, Maski prospect, Ashoka prospect and Sanbal prospect.

The mining method suggested for Ganajur Gold project by Snowden (mining consultancy based in Perth, Australia) is conventional open pit mining with load, haul and drill blast activities performed by an experienced mining contractor. It is planned that the mining contractor will buy back the waste for use in their civil operations elsewhere, subject to an off take agreement with DESPL. The Ganajur gold ore comprises layer of oxide Ore followed by Sulphide Ore and will be mined at the rate of 0.3 Mtpa. The proposed mining plan envisages the Oxide and Sulphide Ores being mined separately. The projected life of mine (LOM) average process operating cost for the 0.3 Mtpa Ganajur Gold recovery plant is USD 18.36/tonne(t) or USD 243/oz of Oxide ore processed and USD 23.53/t or USD 249.31/oz for the Sulphide ore processed. Snowden has estimated 2.14 million tonnes @ 3.63g/t gold as proved Ore Reserves, and 0.37 million tonnes @1.98 g/t as Probable Resreves for the Ganajur Main Gold Deposit.

DGML in Joint Venture with JB Group examined the available data to select the area for reconnaissance studies. The detailed geological mapping and systematic channel sampling have revealed the 5 sub-parallel zone of gold mineralisation in Hesdaba prospects and Asaleyta prospects in Djibouti in Africa.

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 report production since 2007-08.

NMDC has secured a gold mining lease in Bulyangombe area in Tanzania. 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 Banswara Dist. Company has been allocated 3 Gold blocks, 2 in Karnataka and 1 in Madhya Pradesh.

Legacy Iron Ore Ltd (NMDC holding 78.56% equity stake) based in Perth, Australia is concentrating in exploration of Gold in Mount Ceila where good occurrence of Gold is observed.

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.

POLICY

Foreign Direct Investment (FDI) up to 100% in Mining Sector in respect of gold is eligible for automatic approval.

Gold being a specified mineral, Mineral Concessions, viz, reconnaissance permits (RP), prospecting licences (PL) and mining leases (ML) for gold are granted by the State Governments after prior approval of the Central Government.

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, i.e., 85%, followed by electronics 6%, medal and coins 2% and other sectors 7%. The Industrial demand especially in the Electrical Sector for gold is mainly on account of its 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. No proper estimation of gold demand in the country could be attempted due to lack of proper consumption data of the end-use industry. However, from overall evaluation it is seen that India has a traditional and stable market for gold consumption. There is increase in demand from Ornamental and Electronic Sectors. Gold is considered a valuable asset, for investments and bank reserves. A huge gap exists between demand and indigenous production which is likely to continue.

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 54,000 tonnes of metal content. The gold reserves are mainly located in Australia, Russia, South Africa, Indonesia, USA, Peru and Brazil. The world reserves of gold are provided in Table- 8.

The world mine production of gold was estimated at 3,330 tonnes in 2017. China contributed about 13% to the world's total mine production of gold followed by Australia (9%), Russia (8%), USA (7%), Canada & Peru (5% each) and Ghana (4%) (Table-9).

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

(In tonnes of gold content)

Country	Reserves
World: Total *(rounded off)*	**54,000**
Australia	9800
Brazil	2400
Canada	2000
China	2000
Ghana	1000
Indonesia	2500
Kazakhstan	1000
Mexico	1400
Papua New Guinea	1300
Peru	2600
Russia	5300
South Africa	6000
Uzbekistan	1800
USA	3000
Other countries	12000

Source: *Mineral Commodity Summaries, 2019.*

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

(In tonnes of metal content)

Country	2015	2016	2017
World: Total	**3140**	**3210**	**3330**
Australia	279	291	294
Brazil	83	80	85
Canada	163	164	176
China[a]	450	453	426
Ghana	112	129*	137*
Indonesia	92	81	99
Kazakhstan	64	75	85
Mexico	135	132	127
Papua New Guinea	58	62	65
Peru	147	153	151
Russia	265	253	270
South Africa	145	142	137
USA	214	222	237
Uzbekistan*	100	100	100
Other countries	832	878	936

Source: *World Mineral Production, 2013-2017.*
a:-Metal production
**:- estimated*

According to Gold Fields Mineral Services Ltd (GFMS), annual review of world gold supply and demand, the total global supply of gold in 2016 was 4,510 tonnes, a slight more than the 4,400 tonnes in 2015. It included an estimated 13 tonnes increase in global primary production and 21 tonnes of net increase in producers stock. Gold recovery from old scrap increased for the second consecutive years by 8 % to 1,270 tonnes. China, the leading scrap-producing country, produced 233 tonnes of gold scrap which was an increase of 3% compared with 2015 production.

The 12 leading gold-producing countries, in decreasing order of production were China, Australia, Russia,USA, Canada, Peru, South Africa, Mexico, Uzbekistan, Sudan, Brazil and Indonesia. These countries together accounted for 69% of global production. The next 12 leading gold-producing countries accounted for about 19% of global gold production.

Prices

The prices of gold are given in the review on "Prices" in General Review.

To give a generalised view of the development in various countries the country-wise description is sourced from latest available publication of Minerals Yearbook 'USGS' 2016 is furnished below:

Argentina

In 2016, gold production was estimated at 56,000 kg, 10 % less than the production in 2015. Much of the decrease was due to the production decline at Goldcorp's Cerro Negro Mine, which produced 11,300 kg of gold down by 28 %. Barrick's Veladero Mine produced 16,900 kg of gold, a 10% decrease compared to the production achieved in 2015 owing to lower ore grade.

Australia

In 2016, gold production in Australia was 2,90,000 kg, up by 4%. Much of the increase was from Newmont's Kalgoorlie Mine, which produced 11,900 kg of gold, 21 % more than that was produced in 2015 because of increased throughputs and higher grade ore. The other Newmont mines (Boddington and Tanami) produced a total 39,200 kg of gold in 2016, compared with 38,300 kg in 2015. Newcrest Mining Ltd.'s Cadia East Mine produced 23,500 kg

of gold, 19% more than that was produced in 2015 because of an increase in the amount of ore mined. Production decline were reported by the Tropicana Mine a joint venture between AngolaGold (70%).

Canada

Canada's gold mine output increased slightly in 2016 to 1,65,034 kg. The Detour Lake Mine produced 16,700 kg of gold in 2016, 6 % more than that was produced in 2015. Agnico Eagle Mines Ltd's La Ronde and Goldex Mines produced 9,550 kg (up by 14%) and 3,750 kg of gold (up by 5%), respectively. The leading gold mine in the country was the Canadian Malartic Mine, jointly owned by Agnico Eagle (50%) and Yamana Gold Inc.(50%), output in 2016 was 18,200 kg of gold slightly more than the production in 2015.

China

In 2016, gold production was 4,53,000 kg, a slight increase from that of 2015. Gold production from gold mines was 3,95,000 kg, and byproduct output from other nonferrous metals mining was 58,600 kg.

According to the China Gold Association, China's gold consumption (which includes bullion consumption) in 2016 was 9,75,000 kg, down by 6.74%. Consumption of gold for industrial and other application was 75,400 kg.

Ghana

In 2016, production was 79,199 kg which was slightly less than the production in 2015. Newmont's Ahafo operation produced 10,900 kg of gold, 5% more than that of 2015, the increase resulted from higher ore throughput that partially offset lower ore grades. At Newmont's Akeyem Mine, production was 14,600 kg of gold slightly less than that of 2015.

FOREIGN TRADE

Exports

The exports of gold (non-monetary & monetary) decreased to 36,929 kg in 2017-18 from 1,33,032 kg in 2016-17. Almost all the exports in 2017-18 were to UAE (99.9 %) and meagre quantities to Turkey, UK and Oman (Tables- 10 to 14).

Imports

Imports of monetary and non-monetary gold increased to 9,55,182 kg in 2017-18 from 7,78,449 kg in 2016-17. The share of Non-monetary: Other Unwrought forms, was 9,52,992 kg. Imports of gold were mainly from Switzerland (44%), UAE (9%), USA (8%), Ghana & Dominican Rep. (7% each), Peru (6%) and South Africa (3%) in terms of volume (Tables-15 to 19).

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

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**133032**	**361795422**	**36929**	**96685965**
UAE	133030	361794922	36926	96683274
Turkey	-	-	1	2661
UK	-	-	1	24
Oman	-	-	1	6
Singapore	1	6	-	-
USA	1	494	-	-

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

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**133032**	**361795422**	**36929**	**96685965**
UAE	133030	361794922	36926	96683274
Turkey	-	-	1	2661
UK	-	-	1	24
Oman	-	-	1	6
Singapore	1	6	-	-
USA	1	494	-	-

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

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**132978**	**361645931**	**36928**	**96685959**
UAE	132978	361645931	36926	96683274
Turkey	-	-	1	2661
UK	-	-	1	24

Table – 13: Exports of Gold-clad Metals/Base Metals, NES (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**++**	**137**	**++**	**147**
Nigeria	-	-	++	59
USA	++	10	++	57
Congo, Dem. Rep.	-	.	++	23
UK	-	-	++	8
Fiji	-	3	++	++
Tunisia	++	124	-	-
Other countries	++	++	++	++

Table – 14 : Exports of Gold, Non-monetary, Other Semi manufactured Forms (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**54**	**149491**	**1**	**6**
Oman	-	-	1	6
USA	1	494	-	-
UAE	52	148991	-	-
Singapore	1	6	-	-
Other countries	++	++	++	++

Table – 15 : Imports of Gold (Non-monetary & Monetary): Total (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**778449**	**1839601333**	**955182**	**2170720693**
Switzerland	377236	1030325235	417729	1106696518
UAE	80119	218246666	85177	228076363
Ghana	48370	118125497	63139	154308593
USA	48709	95346402	77102	135499083
Peru	24688	39271145	59771	114508652
South Africa	42259	113418330	30850	82260226
Hong Kong	7931	21599419	16855	45763717
Bolivia	4597	11426927	17280	42758170
Dominican Rep.	59150	40742624	71211	37714932
Tanzania	10476	20991533	18362	37352813
Other countries	74914	130107555	97706	185781626

Table – 16 : Imports of Gold, Non-monetary: Other Semi-manufactured Forms (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**13021**	**9363178**	**2188**	**5324602**
USA	452	1095282	1073	2747270
Turkey	-	-	433	1202578
Hong Kong	95	266508	133	339858
Spain	68	182183	122	283227
UAE	22	48967	75	202517
Germany	104	162676	119	176908
Italy	41	113803	60	160167
Canada	-	-	25	68111
Singapore	12	27096	25	59287
UK	1	505	19	54528
Other countries	12226	7466158	104	30151

Table – 17 : Imports of Gold, Non-monetary: Other Unwrought Forms (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**765426**	**1830238051**	**952992**	**2165393829**
Switzerland	377236	1030325235	417729	1106696518
UAE	80097	218197699	85102	227873846
Ghana	48370	118125497	63139	154308593
USA	48257	94251120	76028	132749566
Peru	24596	39175654	59678	114490620
South Africa	42259	113418330	30850	82260226
Hong Kong	7836	21332911	16722	45423859
Bolivia	4597	11426927	17280	42758170
Dominican Rep.	49501	34121998	71211	37714932
Tanzania	10476	20991533	18362	37352813
Other countries	72201	128871147	96891	183764686

Table – 18 : Imports of Gold, Non-monetary, Powder (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**2**	**104**	**2**	**2262**
USA	-	-	1	2247
UK	1	28	1	15
Chinese Taipei/ Taiwan	1	76	-	-
Other countries	++	++	++	++

Table – 19 : Imports of Gold-Clad Metal / Base Metals, NES (By Countries)

Country	2016-17		2017-18	
	Qty (kg)	Value (`'000)	Qty (kg)	Value (`'000)
All Countries	**++**	**4605**	**++**	**340**
Italy			++	340
Canada	++	155	-	-
USA	++	4174	-	-
UK	++	276	-	-
Other countries	++	++	++	++

FUTURE OUTLOOK

Historically, investors have purchased gold as a safe haven, hedge against economic failures, portfolio diversifier and store of wealth. In 2017, anticipated global consumption of gold is expected to increase, because any decline in jewellery purchases resulting from gold price increase is expected to be more than offset by increased gold demand by investors. Domestic and worldwide gold mine production are expected to increase slightly, and world wide gold recycling is expected to decline in 2017 owing to lack of gold scrap stocks.

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

As per the World Gold Council's report, 2017 "GST's impact on India's gold market ", GST represents a radical step forward for India's economy. While it could present short-term challenges to the Gold Industry, it will boost the economy and make the Gold Industry more transparent to the benefit of gold buyers. This should support India's gold demand, which is expected to be between 650-750 tonnes in 2017-18, and touch to 850-950 tonnes by 2020.