

GOLD



Indian Minerals Yearbook 2015

(Part- II : Metals & Alloys)

54th Edition

GOLD

(FINAL RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX: (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

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Gold is the most malleable of all metals and highly valued by mankind since antiquity as an adornment for cultural status and decorative purposes. Gold is generally believed to be a symbol of security and prosperity. Gold is a relatively scarce metal in the world and a scarce commodity in India. Properties of gold which make it useful for industrial consumption are malleability, ductility, colour, resistance to corrosion, high electrical conductivity, lustre and therapeutic effects of some of its salts. India is a minor producer of gold but has huge demand for the metal mainly in jewellery and ornament sector. The domestic demand is mainly met through imports.

RESOURCES

As per UNFC system, as on 1.4.2013, the total resources of gold ore in the country was estimated at 494.80 million tonnes. Out of these, 14.61 million tonnes were placed under reserves category and the remaining 480.19 million tonnes under remaining resources category. The total resources of gold (primary), in terms of metal stood at 640.41 tonnes. Out of these, 71.91 tonnes were placed under reserves category and 568.5 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 (45%) followed by Rajasthan(24%), Karnataka(21%), West Bengal(3%), Andhra Pradesh and Madhya Pradesh(2% each). The remaining 3% resources of ore are located in Chhattisgarh, Jharkhand, Kerala, Maharashtra and Tamil Nadu. In terms of metal content, Karnataka remained on top followed by Rajasthan, Bihar, Andhra Pradesh, Jharkhand, etc. (Table-1).

EXPLORATION & DEVELOPMENT

GSI and HGML carried out exploration for gold in 2014-15. Gold, along with other minerals continued to be the principal thrust area for exploration by GSI

in Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha and Rajasthan.

HGML conducted exploration in its mining lease areas viz, Hutti, Hira-Buddini and Uti Gold Mines in Raichur district in Karnataka. Details of exploration activities undertaken in 2014-15 by various exploration agencies are furnished in Table- 2.

PRODUCTION, STOCKS & PRICES

The production of gold ore at 449 thousand tonnes during 2014-15 increased by 7 % as compared to that in the previous year. The quantity of ore treated decreased from 575 thousand tonnes in 2013-14 to 543 thousand tonnes during 2014-15. There were five reporting mines of gold ore in 2014-15 as compared to four mines in the previous year.

The average grade of gold ore produced in India during 2014-15 was 4.19 g/t as against 3.59 g/t in 2013-14, whereas, that of gold ore treated was 2.91 g/t in 2014-15 as compared to 2.99 g/t in 2013-14.

Production of primary gold in 2014-15 at 1,440 kg decreased by 8% 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 like silver and selenium are also recovered at the plant located in Dahej, district Bharuch, Gujarat. The production of by-product gold by HINDALCO was 8,547 kg in 2014-15 as compared to 7,645 kg in 2013-14.

Karnataka was the main leading producer of primary gold accounting for 99% of the total production. The remaining production was reported from Jharkhand (Tables- 3 to 7).

The average daily employment of labour in 2014-15 was 3,432 as against 3,433 in the previous year. The domestic prices of gold are furnished in the General Review on 'Prices'.

**Table – 1 : Reserves/Resources of Gold as on 1.04.2013
(By Grades/States)**

(In tonnes)

State/Grade	Reserves				Remaining resources						Total resources (A+B)			
	Proved STD111	Probable		Total A	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance		Total B
		STD121	STD122			STD221	STD222					STD334	STD335	
All India :Total														
Ore (Primary)	10920436	2832000	863529	14615965	1486133	1260000	1104647	38101248	70136727	223529973	144569333	480188061	494804026	
Metal (Primary)	56.44	7.72	7.75	71.91	4.98	3.59	4.35	144.5	143.8	206.78	60.5	568.5	640.41	
Ore (Placer)	-	-	-	-	-	-	-	-	2552000	23569000	-	26121000	26121000	
Metal (Placer)	-	-	-	-	-	-	-	-	2.29	3.57	-	5.86	5.86	
By States														
Andhra Pradesh														
Ore (Primary)	-	-	-	-	655133	-	889515	8059000	55000	2616699	-	12275347	12275347	
Metal (Primary)	-	-	-	-	2.45	-	3.57	16.93	0.17	12.6	-	35.72	35.72	
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)	20900	-	-	20900	-	-	-	-	5146952	4203337	-	9350289	9371189	
Metal (Primary)	0.07	-	-	0.07	-	-	-	-	3.61	10.26	-	13.87	13.94	
Karnataka														
Ore (Primary)	10899536	2832000	863529	14595065	831000	1260000	215132	24979968	8204595	16020324	37673000	89184019	103779084	
Metal (Primary)	56.37	7.72	7.75	71.84	2.53	3.59	0.78	120.73	28.67	38.29	43.78	238.37	310.21	

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Table - 1 (Concl.d.)

Grade/State	Reserves				Remaining resources						Total resources (A+B)			
	Proved STD111	Probable		Total A	Feasibility STD221	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance		Total B
		STD121	STD122			STD221	STD222					STD334	STD335	
Kerala														
Ore (Primary)	-	-	-	-	-	-	-	462280	96180	-	-	-	558460	558460
Metal (Primary)	-	-	-	-	-	-	0.17	0.03	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	64032720	63000	118888720	118888720	118888720
Metal (Primary)	-	-	-	-	-	-	6.67	103.34	113.55	0.07	223.63	223.63	223.63	223.63
Tamil Nadu														
Ore (Primary)	-	-	-	-	-	-	-	-	-	67000	-	-	67000	67000
Metal (Primary)	-	-	-	-	-	-	-	-	-	1	-	-	1	1
West Bengal														
Ore (Primary)	-	-	-	-	-	-	-	-	-	-	-	-	12833333	12833333
Metal (Primary)	-	-	-	-	-	-	-	-	-	-	-	-	0.65	0.65

Figures rounded off.

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Table – 2 : Details of Exploration Activities for Gold, 2014-15

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Andhra Pradesh		-	-	-	-	33	G-4 stage investigation was carried out in the western part of the Proterozoic Cuddapah Basin. In Kalava South Block the quartz veins are trending in NE-SW and ENE-WSW directions. They are intruded in gabbroic sills with cumulative strike extension of about 700 m with width varying from a few centimeters to 2.5 m. This quartz veins show sulphide mineralisation in the form of chalcopyrite disseminations and malachite staining. In the Kalava block, two old workings of copper were noticed which are surrounded by the dump material consisting of quartz vein, basic sill and ferruginous shale fragments. Quartz vein rubble shows incidence of sulphides mainly pyrite and chalcopyrite with malachite staining. The old workings in the Gani block extend for a strike length of about 2.4 km in an en-echelon pattern in NW-SE direction and are situated generally at the shale/sill contacts. The Gani block is devoid of any gossan and wall rock alteration characteristics. However, chloritisation, silicification and presence of carbonate have been noticed. A total of 25 cu.m trenching was carried out in the Kalava east block. Trench KT-1 was excavated in the old working which exposed quartz-carbonate vein with sulphides in the form of disseminations and malachite staining. Trench KT-3 excavated in the further east of the Kalava east block exposed quartz vein with chalcopyrite specks and malachite staining. Bed rock samples analysed 60 ppb to 9 ppm. Au. Out of the 04 samples collected from the NE-SW trending quartz vein in Kalava south block, 2 samples analysed 9 ppm and 1.5 ppm Au. Ten trench samples from the Kalava east block showed Au values ranging from <25 ppb to 85 ppb. The quartz-carbonate vein exposed in the trench KT-1 analysed 85 ppb Au. IP/Res/SP surveys have been carried out in the Kalava east and south block. The investigation is still on and shall continue.
Kurnool	Gani- Kalava area						

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Table – 2 (contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Bihar							
Gaya	Majhauri- Ghansura- Ajaynagar area	-	-	7	-	9	G-4 stage investigation was carried out to identify zones of gold mineralisation. Surface work was carried out in Majhauri (Block-B) and Ghansura (Block-C) and West Ajaynagar (Block-D) by scout drilling. Three boreholes were targeted in Majhauri block (Block-B). The main lithology intersected along these boreholes included tuff with associated very thin BIF bands (<30 cm), phyllite and gabbro sill. From the analytical results so far received a yield of low range anomalous Au value ranging from 50 ppb to 295 ppb has been reported. Three zones of one metre thickness each were identified in borehole NB-09 at 69.35 to 70.35 m (Average Au=210 ppb), 70.95 to 72.3 m (Average Au=65 ppb) and 73.7 to 74.5 m (Average Au=75 ppb). Various lithounits intersected along boreholes include basalt, rhyolite, mixed (hybrid) rock and banded carbonate chert. Sulphide minerals mainly pyrrhotite, pyrite, chalcopyrite and bornite have been found associated with rhyolite, basalt, and mixed rocks and associated quartz veins. Block-D exposed tuffaceous phyllite, rhyolite, basalt, gabbro sill, andesite, carbonate, mixed volcanic rock showing features of mixing and mingling of felsic and mafic magmas. Sulphide zones have been identified within rhyolite, mixed rock and quartz veins. Geophysical survey (IP-SP) of 61.121 km carried out in the Block D helped in delineating two prominent anomaly zones, (Zone-I and Zone-II) characterised by high chargeability and low SP. The depth of the top of the causative body estimated from the IP/resistivity pseudo depth section is at about 15 m to 20 m from the surface. All samples yielded anomalous Au value ranging from 60 ppb to 950 ppb (Avg 277 ppb). The investigation has been completed.
Jharkhand							
Ranchi	Sindauri- Ghanshyampur	-	-	4	-	-	G-3 stage investigation was carried out within Dalma volcanics and Singhbhum Group metasedimentaries to assess their gold potentiality. The area exposed metasediments of Singhbhum Group, rocks of Chhotanagpur Gneissic Complex and volcanic rocks of Dalma Group. The rock types intersected in these boreholes comprised magnetite-quartz-biotite-sericite schist, phyllite, buff/grey quartzite, calc-quartzite/ferruginous quartzite, quartzo-feldspathic phyllite, amphibolites of Upper Singhbhum Group. The sulphide mineralised zones intersected in boreholes comprise stringers of arsenopyrite, pyrrhotites, pyrite, chalcopyrite along with suspected gold grains. The investigation has been completed.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Seraikela- Kharsawan	Largadih Largadih East block	-	-	-	-	-	G-4 stage investigation was carried out for assessment of gold and REE-RM potentiality. The area exposed Dalma volcanics and metasedimentaries of Singhbhum Group. Gold mineralisation is hosted by sheared and brecciated quartz vein and is manifested by gossans, ferruginisation and brecciation on surface. The sulphide mineralised zones intersected in boreholes comprise dissemination and stringers of pyrite, arsenopyrite, chalcopyrite and sphalerite. Analytical results of core and trench samples, received so far, show Au values <50 ppb. A few mineralised zones have been delineated based on visual estimate of sulphides (2.3%). The investigation has been completed.
Karnataka Dharwar	Bangaragatti area	-	10	-	-	35	G-3 stage investigation was carried out to assess gold mineralisation. Geologically, the area consists of metasedimentary rocks like argillite and banded iron formation (BIF). The BIF is interbedded with argillite rock and they are structurally disturbed at folded portions; the band thickness varies from half metre to six metres at places. The total cumulative length of BIF is 800 m and 24 cubic m trench was excavated. A total of 35 BRS, 7 samples for petrological studies and 6 for ore microscopic study were collected. Ten boreholes each of 100 m depth are planned in the central band to establish the sub-surface behaviour of about one km long mineralised zone during the FS 2014-15. The exploration by drilling in the Bangaragatti area commenced from the northern side of the block. The area is located at a distance of 2.5 km west of village Hullambi. All the boreholes intersected the zones with various widths and thicknesses. The zone is characterised by disseminations of sulphides. The investigation will be continued.
-do	Hulkoppa block	-	-	-	-	114	G-4 investigation was carried out for gold. The mapped area exposed argillite-greywacke assemblage with BIF bands, traversed by younger gabbro dykes and quartz veins of different generations. During the period five BMQ bands were delineated in the area and were named as band nos. I, II, III, IV & V. A total cumulative strike length of 3100 m is established in five BMQ bands. The mineralisation here is mainly confined to quartz carbonate veins/veinlets hosted by the sheared BMQ that contains sulphides, mainly pyrite and pyrrhotite and a few specks of arsenopyrite. Trenches have been excavated across the BMQ bands at 100-150 m intervals. Samples collected across the BMQ bands were submitted for chemical analysis. The investigation has been completed.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Karnataka							
Tumakuru	Ajjanahalli Block G	-	-	-	-	256	G-3 stage investigation (G-3) was carried out for assessment of gold mineralisation. In Block-G, a total of 255 of borehole core samples and one bed rock sample were collected. Chemical analysis of 172 samples (collected from boreholes AGG-1 to AGG-3 & 11 nos. of samples of AGG-4) has been received so far. In AGG-1 average gold value is of 0.19g/t/1.0 m whereas in borehole AGG-2 the same mineralised zone continues with values of 0.63 g/t/1.0 m and 0.90 g/t/0.5 m in the targeted BIF band. In AGG-3 gold values are of 0.30g/t/0.5 m and 0.5 g/t/0.5 m. In Borehole AGG-4, the average gold value is of 0.18 g/t/1.0 m in the targeted BIF band. Sulphide mineralisation, such as, pyrite, pyrrhotite and arsenopyrite occurs as disseminated specks, vein and stringers foliation/fracture planes in the BIF band as well as carbon phyllite unit. The mineralisation is confined to sheared silicified BIF hosting thin quartz-carbonate veins and veinlets. The investigation will be continued.
-do-	Ajjanahalli- area	-	-	-	-	160	G-4 stage investigation was carried out to delineate gold mineralised zones. In Ajjanahalli H-block, the detailed geological mapping has been completed and fifty-seven bed rock samples, 66 cu.m of trenching and 45 trench samples have been generated. One carbonated BIF band with four major BIF bands and other two minor BIF bands between BIF-II & III were delineated. The carbonated BIF band, with a total strike length of 550 m, is partly massive and partly brecciated. The BIF band-I, with strike length of 1050 m, shows partly massive and partly brecciated and silicified. Three trenches were excavated at 75 m to 100 m interval. BIF band-II & III, with total strike length of 750 m & 1000 m are partly massive and some partly brecciated and silicified in nature. BIF band-IV, with a strike length of 600 m, is very thin having a width of maximum 2 m. Analytical results of 58 samples (BRS+PTS), 5 showed Au values varying from 0.04 g/t/1 m to 0.15 g/t/1m. The investigation has been completed.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Karnataka							
Shivamogga	Shimoga Schist belt	-	-	-	-	-	G-4 stage investigation was carried out for assessment of gold mineralisation. The project area exposed rocks of Jandimatti Formation of Shimoga Group and are characterised by the sequences of meta-sedimentary and meta-volcanic rocks. The different rock types observed during mapping are quartzite, quartz-chlorite schist, meta basalt, BIF and conglomerate. The gold mineralisation in the area is confined within the metabasalt and quartz-carbonate veins hosted by metabasalt. To the southern part of Kudrekonds block, evidences of shear and mineralisation has been observed 30 metres east of main zone (which is marked by the alignment of old workings). This zone is traceable for 100 metres and characterised by pyrrhotite and chalcopyrite. The quartz rubble from this part shows malachite stains as well. The BIF bands NW of Maddapuratands are found sulphidiferous and have been sampled for the entire strike length to identify potential zones, if any. The investigation has been completed.
-do-	Musinhali	-	-	-	-	-	G-4 stage investigation was carried out to assess gold mineralisation. Quartz-carbonate rock with intrusive quartzite, banded magnetite quartzite, titaniferous-vanadiferous magnetite, basic dyke and quartz veins were occasionally observed throughout the area. Layered carbonated metabasalt with sulphide grains i.e. pyrite, chalcopyrite are observed atop 774 ridge, 2 km NW of Village Musinhali on the way to Village Palavanahalli. In NW of Village Musinhali highly sheared metabasalt and quartz-chlorite-schist have been observed. This shear zone forms a parallel zone to the trend of Kudrakonds old working mines, Pounding marks are observed on massive outcrop along the slope of ridge at Birnakere Reserve Forest. A zone of titaniferous-vanadiferous magnetite (TVM zone) of 3 km length and 250 m width has been traced with discontinuous patches about 1 km SE of Village Yadavala to 2 km east of SE of Village Tyjavalli. Small pockets of manganese also have been discovered at 3 km west of Village Birnakere in the around 852 peak/ridge. The investigation has been completed.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Kerala							
Palakkad	Attapady Valley	-	-	-	-	20	G-4 stage investigation for gold was carried out with an objective to trace the granite-supracrustal relationship and to delineated the mineralised zones by bedrock and soil geochemical survey. The mapped area comprised biotite gneiss, hornblende gneiss, granite, amphibolite, banded iron formation, meta-ultramafics, mafic dykes, pegmatites and quartz veins. Shearing is very intense in southwestern and southern parts of the area and is marked by very closely spaced (phyllitic-type) foliation in biotite gneiss. The method of panning the first order and second order streams in the area for gold was adopted for preliminary and rapid assessment of gold mineralisation. A total of 130 first-order streams were panned to establish the lithological control of mineralisation. Out of 130 locations, 61 yielded gold specks. Based on the results of gold panning, an ENE-WSW trending zone extending from around Puttumala to Kurukkankundu was identified as one of the target zones for soil sampling. Two other areas, one near Ommala and another between Jellippara and Mundanpara were also covered by soil sampling in 100 x 25 m grid pattern. Sulphide-bearing samples were collected from the trenches to understand the mode of mineralisation. Granites around Puttumala and Sholayur area have been considered for detailed geochemical study including major, trace and REE elements to decipher their origin and role in gold mineralisation. Twelve soil samples and 8 trench samples from these target zones yielded Au value above 25 ppb. Within this, the highest value of 800 ppb was yielded from a trench sample in the Puttumala area. The investigation has been completed.
Madhya Pradesh							
Betul	Amla, Belnadi, Jambara, Sonatalai etc.	-	-	-	-	-	G-4 stage investigation was carried out. BRS and stream sediment samples were collected in 200 x 200 grid for analysis. The area is part of Betul Gneissic Complex and represents variants of Archaean-Proterozoic Amla gneisses, mafic and ultramafic bodies including pyroxenite, gabbro and amphibolites, pillowed basalt and metarhyolites. These rocks are intruded by younger dolerite dykes, granitoids and associated aplites, quartzo-feldspathic veins and quartz veins. All these rocks are overlain by a thin veneer of Deccan Trap basalt. Chalcopyrite occurs in close association with covellite and the covellite appears to be an alteration products of chalcopyrite. Pyrite is the dominant sulphide mineral phase and occurs as euhedral grains, as fracture fillings and in disseminated pattern. The investigation has been completed.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Maharashtra							
Sindhudurg	Kundal- Kankavle- Vagre area	1:5000	1	-	-	-	G-4 stage investigation was carried out in the precambrian terrain. The predominant rock types exposed are BIF, serpentinite, amphibolite which occur as dismembered enclaves within TTG gneiss. This suite of rocks is intruded by granitoid, gabbroid, pegmatite and quartz veins. Occurrences of felsic intrusives with pyrite and chalcopyrite were noted near the contact zone between serpentinite and granitoid. Dabachiwadi area exposed serpentinite/dunite, BMQ, TTG gneiss, foliated granite gneiss, grey quartz vein, pegmatite and felsic intrusive with pyrite-chalcopyrite disseminations (exposed dimension is 75 m x 80 m). The presence of granite mylonite close to the sulphide-rich occurrence possibly indicates a shear zone. The serpentinite/dunite exposed in the area exhibits chrome concentration as black sub-metallic mineral along weak planes. A few nickel sulphides were also noticed in these rocks. These bodies appear to be potential sources for Ni-Cr-PGE. There are many reported economic concentrations of Au in such bands. These have been sampled for Au analysis. Number of pegmatites seen close to the granitoid bodies could be host for REE. The investigation will be continued during FS 2015-16.
Odisha							
Kendujhar and Angul	Jamphirposi- Shankarkhol block	-	-	-	-	-	G-4 stage investigation was carried out in search of gold mineralisation BRS samples of metabasalt have shown gold value of 200 ppb, 210 ppb and 540 ppb, whereas panned concentrate of SSS yielded up to 300 flakes of visible gold/nugget from 1 st and 2 nd order nasals. The sulphides occur in the form of lenses, veinlets and disseminations. The laterites with criss-crossing smoky/white quartz veins and Quartz Pebble Conglomerate (QPC) horizons are sampled for possible gold occurrence. The investigation has been completed.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Rajasthan							
Banswara	Gundelapara West block	-	-	9	-	-	G-3 stage investigation was carried out to test the sub-surface continuity of the three parallel to sub-parallel mineralised zones (numbered I, II and III from east to west), delineated during FS 2012-13 on the basis of surface geological and geochemical attributes. A total of 9 boreholes have been drilled, so far, to intersect the mineralisation zones I to III at 100 m interval. All the boreholes proved the subsurface continuity of the mineralised zones. Study of the borehole cores shows that primary sulphides occur mainly in dolomite marble, albite-rich rock and amphibolite in order of decreasing abundance. The sulphide mineral assemblage is represented by pyrrhotite, arsenopyrite, pyrite and chalcopyrite in order of decreasing abundance. The width of sulphide zones along boreholes varies from 1.00 m to 14.15 m and visual estimate of sulphides ranges from 5 to 8%. Sub-surface exploration has established 100 m, 200 m and 500 m strike continuity of mineralised zones - MZ-I, II and III. Analytical results of the core samples of boreholes GW-1 to 4 revealed the presence of copper zones varying in width along borehole from 1.10 m - 4.05 m, with average grade of copper ranging from 0.13 to 1.08% at 0.10% cut off and 1.0 m stopping width. The investigation has been completed.
Banswara Udaipur & Dungarpur	Khamera & Develapal	-	-	-	-	4	G-4 stage investigation was carried out to assess the potentiality of gold-copper mineralisation. The lithounits of the area from a part of Mangalwar Complex of Bhilwara Supergroup and Aravalli Supergroup comprising granitoids, quartzite, white dolomitic marble, grey banded marble, bluish grey marble with phyllitic interbands, meta-greywacke, grey phyllite, staurolite-mica schist, magnetite bearing muscovite-chlorite schist, conglomerate and quartz veins. Five mineralised zones (100-650 m long) are demarcated in the mapped area. Analytical results of a 12 m long channel at contact of grey marble and grey schist near Village Sarpotia indicated presence of 0.34% average Zn. Four bed rock samples from Mokhampura, Ganera, Hirawa and Dhauli Magri villages show Cu values of 2012 ppm, 1528 ppm, 1074 ppm and 1105 ppm respectively. Two bedrock samples collected from ferruginised grey marble and from an old working at Ganera and Mokhampura villages have analysed anomalous Ni (1028 ppm and 1711 ppm). One bedrock sample collected from an old working within grey marble near Village Sarpotia has analysed anomalous Pb (1402 ppm). Similarly another bedrock sample from white dolomitic marble from near to Village Dhauli Magri have analysed anomalous Ba (1649 ppm). The investigation has been completed.

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Table - 2 (Concl.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Rajasthan							
Dungarpur	Mahurikhera area	-	-	-	-	-	G-4 stage investigation was carried out to assess the potentiality of gold-copper mineralisation. The lithounits exposed in Mahurikhera area, are part of Mukundpura Formation of Debari Group of Aravalli Supergroup comprising fine-grained chlorite schist with tourmalinites bands, dolomitic marble, banded marble, silicified marble, brecciated magnetite bearing silicified quartzite and Jasperoid intruded by quartz and pegmatite veins. Seven mineralised zones (MZ-I to VII) have been demarcated on the basis of surface evidences of mineralisation in the form of old-workings, gossan zones, sulphides including chalcopyrite and pyrite disseminations, malachite stains, silicification, hydrothermal alterations, presence of ore grinding implements and slag dump in the area. Analytical results of channel samples received so far indicated presence of 1.00 m to 12.00 m thick gold zones with average grade 0.10 ppm to 1.11 ppm at 0.10 ppm cut-off. At 0.10% cut-off, width of copper zones varies from 1.00 m to 18.00 m with average copper content 0.10% to 0.45%. The investigation has been completed.
HGML Karnataka							
Raichur	Hutti	(UG) 1:400	2045.10 m	19 (surface) 47(U/G)	3865.85 3917.7	10005	As on 31-03-2015, reserves/ resources of gold ore were estimated at 9.21million tonnes with 5.28 g/t Au under proved and 7.23 million tonnes with 4.83 g/t Au under probable category.
-do-	Hira-Buddini	1:400	352.80	-	-	1081	About 0.502 million tonnes of proved reserves of gold ore with 3.94 g/t Au were estimated.
-do-	Uti	1:400	-	-	-	1628	Total mineable reserves are estimated at 2.18 million tonnes ore with 2.59 g/t Au.

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Table – 3 : Producers of Gold, 2014-15

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

**Table – 4 : Production of Gold Ore
2013-14 and 2014-15
(By States)**

(In tonnes)

State	2013-14		2014-15 (P)	
	Ore Produced	Avg. Grade (g/t)	Ore Produced	Avg. Grade (g/t)
India	420429	3.59	448671	4.19
Jharkhand	7552	1.38	4232	2.75
Karnataka	412877	3.63	444439	4.21

**Table – 5: Gold Ore Treated
2013-14 and 2014-15
(By States)**

(In tonnes)

State	2013-14		2014-15 (P)	
	Ore treated	Avg. Grade (g/t)	Ore treated	Avg. Grade (g/t)
India	574918	2.97	543274	2.91
Jharkhand	7552	1.36	3686	3.16
Karnataka	567366	2.99	539588	2.91

**Table – 6: Production of Gold, 2012-13 to 2014-15
(By States)**

(Quantity in kg; Value in ₹'000)

State	2012-13		2013-14		2014-15 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	1588	5172517	1564	4225317	1440	3607600
Primary						
Gold	1588	5172517	1564	4225317	1440	3607600
Jharkhand	5	14548	8	22728	11	30839
Karnataka	1583	5157969	1556	4202589	1429	3576761

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**Table – 7: Production of Gold, 2013-14 and 2014-15
(By Sectors/States/Districts)**

(Quantity in kg; Value in ₹'000)

State/District	No. of mines	2013-14		No. of mines	2014-15 (P)	
		Quantity	Value		Quantity	Value
India	4	1564	4225317	5	1440	3607600
Public Sector	3	1556	4202589	3	1429	3576761
Private Sector	1	8	22728	2	11	30839
Primary Gold	4	1564	4225317	5	1440	3607600
Andhra Pradesh	-	-	-	1*	-	-
Kurnool	-	-	-	1*	-	-
Jharkhand	1	8	22728	1	11	30839
Singhbhum East	1	8	22728	1	11	30839
Karnataka	3	1556	4202589	3	1429	3576761
Raichur	3	1556	4202589	3	1429	3576761

* Only Labour reported.

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 2014-15 which was at about 9,987 kg increased by about 8 % as compared to 9,209 kg in the previous year.

**Table – 8 : Production of Gold Bullion
2012-13 to 2014-15**

(Quantity in kg; Value in ₹'000)

Year	Quantity	Value
2012-13	8304	24693927
2013-14	9209	24833062
2014-15 (P)	9987	25085847

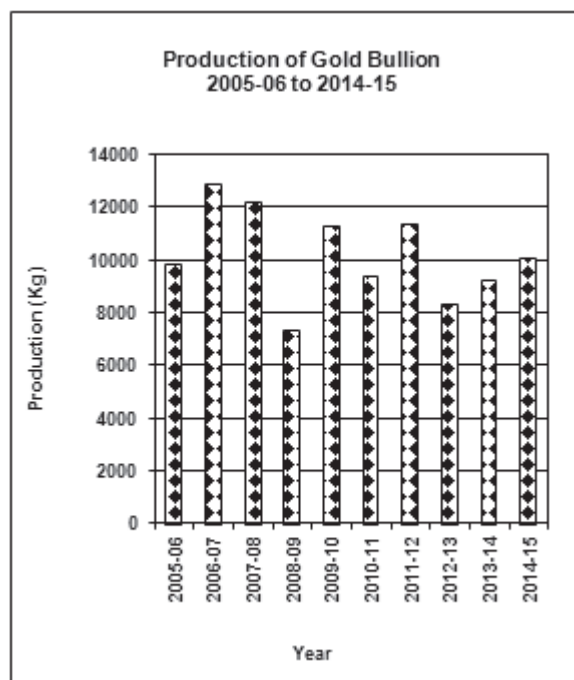
Note: Includes gold recovered as by-product from copper concentrates by Hindalco Industries Ltd in Gujarat.

MINING & MILLING

Presently, HGML is the only Public Sector Company producing gold in the country. While in the Private Sector Manmohan Industries Pvt. Ltd is engaged in mine production of gold at

Kunderkocha, in Singhbhum East district, Jharkhand by underground method of mining. HGML operates mines at Hutti, Uti and Hira-Buddini in Raichur district, Karnataka. The total installed capacity of these mines 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 4,68,735 tonnes during 2014-15. Sub-level and LDBH stoping methods are used to exploit the gold ore. In the Uti mine, opencast method is followed and the ore from this mine is transported to Hutti mine for processing at the mills. The present mine production as reported in 2014-15 was 48,023 tonnes of ore. As per the feasibility studies, opencast mining is viable and will be continued to 90 m vertical depth. 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. The production of the mine was 23,961 tonnes during 2014-15. Exploratory mine development using compressed air jackhammer drilling and electrical hoist in the

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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 OMS.

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 are 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°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

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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

HGML is the 40th member of the World Gold Council and the first one from India.

The Deccan Gold Mines Ltd (DGML), India's first and largest listed gold exploration company, collected rock and stream sediment samples and analysed them. 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, Manglur belt, Dharwar-Shimoga 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.

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 Dgibouti.

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.

A study on Techno-economic Feasibility of Ajjanahalli Gold Mine of M/s. Hutti Gold Mines Ltd, Hutti, Distt. Raichur, Karnataka was carried out by Mining Research Cell, TMP Division of IBM. The project has been completed and the

report was submitted to the party. The details have been discussed in the chapter on Research & Development provided in Vol. I of this title.

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), 2009-14, 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 hydrogenion

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 a valuable asset for besides 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.

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WORLD REVIEW

The estimated world reserves of gold were about 57,000 tonnes of metal. 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-9.

The world mine production of gold was estimated at 3,015 tonnes in 2014. China contributed about 15% in world's total mine production of gold followed by Australia (9%), Russia (8%), USA (7%) and South Africa & Peru (5% each) (Table-10).

**Table – 9: World Reserves of Gold
(By Principal Countries)**

(In tonnes of gold content)	
Country	Reserves
World: Total (rounded)	57,000
Australia	9100
Brazil	2400
Canada	2000
China	1900
Ghana	1200
Indonesia	3000
Mexico	1400
Papua New Guinea	1200
Peru	2800
Russia	8000
South Africa	6000
Uzbekistan	1700
USA	3000
Other countries	13000

Source: Mineral Commodity Summaries, 2016.

**Table – 10 : World Mine Production of Gold
(By Principal Countries)**

(In tonnes of metal content)			
Country	2012	2013	2014
World: Total	2730	2924	3015
Argentina	55	52	72
Australia	252	268	274
Brazil	67	80	80 ^e
Canada	107	134	152
Chile	50	51	46
China [@]	403	428	452
Columbia	66	56	57
Ghana	90	99	99
Indonesia	69	60	69
Kazakhstan	43	47 ^e	42 ^e
Mali ^e	41	46	45
Mexico	103	120	118
Papua New Guinea	56	56	53
Peru	162	151	140
Russia	200	230	249
South Africa	154	160	152
Sudan	45	70	70 ^e
Tanzania	39	43	41
USA	235	228	210
Uzbekistan ^e	90	90	102
Other countries	403	455	492

Source: World Mineral Production, 2010-2014.

@- Metal production,

According to Gold Fields Mineral Services Ltd. (GFMS) annual review of world gold supply and demand, the total global supply of gold in 2014 was 4,362 tonnes, a slight increase compared with 4,310 tonnes in 2013. It included an estimated 72 tonnes in global primary

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production and 142 tonnes of net decrease in producers stock. Gold recovery from old scrap decreased by 162 tonnes to 1,125 tonnes and was at the lowest level since 2007.

The 12 leading gold -producing countries, in decreasing order of production were China, Australia, Russia, USA, Canada, South Africa, Peru, Canada, Uzbekistan, Mexico, Ghana, Brazil and Indonesia. These countries together accounted for 70% of global production. The next 12 leading gold-producing countries accounted for almost 17% of global gold production.

Prices

The gold prices have been decreased from US \$ 1415 per troy ounce to US \$ 1270 per troy ounce during 2014.

Argentina

In 2014, gold production was estimated at 59,000 kg, 16% more than that in 2013. Goldcorp's Cerro Negro mine began production and produced about 4,700 kg of gold by year end. Barrick's Veladero Mine increased gold production owing to higher ore grade. Yamana Gold Inc's Gualcamayo Mine produced 5,610 kg of gold, almost a 50% increase from 2013 production owing to higher ore grade and the rampup of the underground operations.

Australia

In 2014, gold production in Australia was 2,73,963 Kg, slightly more than that in 2013. Production increased at recently commissioned mines— Andy Well (Doray Minerals Ltd), Tropicana (AngloGold), Mount Carlton (Evolution Mining Ltd.) and Tomingley (Alkane Resources Ltd) and at some more established mines.

Brazil

In 2014, gold production was estimated to be 80,000 kg, a slight increase compared with that in 2013, Brio Gold Inc. (a subsidiary of Yamana Gold Inc.) completed construction of the pilar Mine in 2013 but the mine did not reach full production rate until the fourthquarter of 2014. Vale S.A.'s Salobo copper mine continued to ramp up to full capacity and produced gold as a by-product.

Canada

Canada's gold mine output increased by 23% in 2014 to 1,52,105 kg. Production increased primarily owing to the startup of the Detour Lake Mine produced 14,200 kg of gold. Other mines that had production increases were Agnico Eagle Mines Ltd.'s(Toronto), Meadowbank Mine and Goldex Mine.

China

China's gold production increased by 5% to an estimated 450,000 kg in 2013, and China remained the leading gold producing country for the eighth consecutive year. The main source of the increase was small and mid-sized miners that sell ores and concentrates to third party gold smelters.

FOREIGN TRADE

Exports

The exports of gold (non-monetary & monetary) decreased to 69,894 kg in 2014-15 from 70,721 kg in 2013-14. The exports in 2014-15 were almost to UAE (99%) and to Switzerland (1%) (Tables- 11 to 15).

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Imports

Imports of monetary and non-monetary gold increased to 9,15,473 kg in 2014-15 from 6,61,715 kg in 2013-14. The share of Non-monetary: Other

Unwrought forms, was 9,03,374 kg. Imports of gold were mainly from Switzerland (55%), UAE (11%), USA (9%), South Africa (5%) and Australia (4%) in terms of volume. (Tables-16 to 20).

**Table – 11 : Exports of Gold (Non-monetary & Monetary) Total
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	70721	183513035	69894	172166206
UAE	70644	183334704	69079	170257477
Switzerland	46	97336	800	1882087
Australia	2	4983	5	12828
Ghana	-	-	5	12038
Hong Kong	5	13807	5	1776
Other countries	24	62205	-	-

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

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	386	916840	6	2105
Hong Kong	5	13807	5	1776
UAE	381	903033	1	329
Other countries	-	-	-	-

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**Table – 13: Exports of Gold Non-monetary
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	70721	183513035	69894	172166206
UAE	70644	183334704	69079	170257477
Switzerland	46	97336	800	1882087
Australia	2	4983	5	12828
Ghana	-	-	5	12038
Hong Kong	5	13807	5	1776
Other countries	24	62205	-	-

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

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	-	-	++	2
Germany	-	-	++	2
Other countries	-	-	-	-

**Table – 15: Exports of Gold, Non-monetary , Other Unwrought Forms
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	70335	182596195	69888	172164101
UAE	70263	182431670	69078	170257149
Switzerland	46	97336	800	1882087
Australia	2	4983	5	12828
Ghana	-	-	5	12037
Other countries	24	62206	-	-

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**Table – 16: Imports of Gold (Non-monetary & Monetary): Total
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	661715	1662426200	915473	2106580447
Switzerland	387166	986998991	499811	1221503115
UAE	119751	304757498	103840	254900282
USA	32694	70711314	81984	165484296
South Africa	58961	149576951	43241	104705618
Australia	22262	56906921	40079	98290226
Ghana	3863	9234821	28241	64388217
Tanzania	8633	18448508	17509	36100293
Brazil	616	1240959	11880	20617354
Guinea	825	1927704	8267	18619790
Colombia	1632	3817852	8521	17999946
Other countries	25312	58804681	72100	103971310

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

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	53288	118579225	12097	24134381
USA	15388	30654147	2453	5095869
Tanzania	3748	7465975	2209	4740896
Ghana	599	1464180	1668	3865587
Brazil	-	-	1234	2331126
Peru	4491	6689740	1676	2022623
UAE	1833	4601141	566	1396874
Saudi Arabia	1116	1952051	794	1331395
Guinea	455	1034287	503	1168352
Colombia	896	2030549	268	571475
Switzerland	19558	49502919	200	484213
Other countries	5204	13184236	526	1125971

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**Table – 18: Imports of Gold, Non-monetary: Other Unwrought Forms
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	608424	1543841589	903374	2082446048
Switzerland	367608	937496073	499611	1221018902
UAE	117918	300156358	103274	253503408
USA	17304	40051814	79530	160388420
South Africa	55051	139647893	43241	104705618
Australia	21962	56079916	40079	98290226
Ghana	3264	7770641	26573	60522630
Tanzania Rep.	4885	10982533	15300	31359397
Brazil	616	1240959	10646	18286228
Guinea	370	893417	7764	17451438
Colombia	736	1787303	8253	17428471
Other countries	18710	47734682	69103	99491310

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

Country	2013-14		2014-15 (P)	
	Qty (kg)	Value (₹'000)	Qty (kg)	Value (₹'000)
All Countries	3	5386	2	18
UK	-	-	1	11
USA	2	5353	1	7
Other countries	1	33	-	-

**Table – 20: Imports of Gold-Clad Metal / Base Metals, NES
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1	411236	++	3959
USA	++	2934	++	3713
Japan	-	-	++	246
Other countries	1	408302	++	-

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FUTURE OUTLOOK

As per the World Gold Council, the world demand for gold during the year 2015 was around 4,193 tonnes. The global annual jewellery demand was the highest followed by gold bars & coins and for technological use.

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. The projected import at the growth rate of 11% during 2012-17 are 9,305 tonnes at an average of 1,861 tonnes per year, as per the report of the Working Group for 12th Five Year Plan (of the then Planning Commission of India). During

the 12th plan period, gold production is projected at 28 tonnes from mines and 16 tonnes as by-product, totalling 44 tonnes by 2015-16, this after factoring in the expansion of existing producers and the proposed new mines that were in the pipeline under the Private Sector, viz., MSPL, Geomysore, Deccan Gold, etc.

As per the World Gold Council estimation, gold consumption in India during 2015 was 1,000 tonnes. India is poised to pip China as the world's top consumer of gold in 2015 as the demand for gold in China is likely to dip due to a rally in stocks and India on the other hand is predictably poised for high economic growth prospects.