

EMERALD



Indian Minerals Yearbook 2018

(Part- III : Mineral Reviews)

57th Edition

EMERALD

(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

June, 2019

11 Emerald

Emerald in Hindi, commonly called as 'Panna', is a variety of mineral beryl and is chemically a complex silicate of aluminium and beryllium ($\text{Be}_3\text{Al}_2(\text{SiO}_3)_6$). The hardness of Emerald is about 7.5-8 on Mohs' scale. Emeralds are rare & precious gemstones that command immense value on account of their cut, colour, clarity and carat. Beauty, rarity and durability are the main virtues of a gemstone. The cut stones are known as gems, while uncut - ones are gemstones. Emeralds occur in hues varying from yellow-green to blue-green. However, emeralds with unique velvety green colour with high degree of transparency are considered as most precious among gemstones. The rose variety of beryl is called morganite, and the golden yellow variety is termed 'golden beryl'. If the colour is bluish green or blue then it is called 'aquamarine'. When emerald contains chromium as an impurity, it imparts the colour green. Emerald is generally found at the contact of pegmatites intruding schists, mainly amphibole schists.

RESERVES/RESOURCES

As per NMI data, as on 01.04.2015 based on UNFC system, the total resources of emerald in the country are estimated at 55.87 tonnes. All resources placed under reconnaissance category and unclassified grade have been reported in the state of Jharkhand only (Table-1).

Occurrences of emerald are also reported from Rajasthan, Odisha and Chhattisgarh. However, resources have not been estimated so far. In Rajasthan, emeralds have been found to occur at a number of places in districts Rajsamand and Ajmer. In Ajmer-Rajsamand belt of Rajasthan, emerald occurrences are confined to the upper fringes of pegmatites. Emerald deposit is found in the 221 km long belt stretching from Gam Gurha in Rajsamand district to Bubani and Muhami in Ajmer district. Important localities are Rajgarh, Tikhi and Kalaguman (Rajsamand). The occurrences are highly sporadic and variable.

In Odisha, occurrences of emerald are reported from Bira-Mohorajpur belt in district Bolangir. In

Chhattisgarh, occurrences of emerald are reported from Deobhog area in Raipur district. Sporadic and irregular crystals of emerald, aquamarine and amethyst are also reported in a few localities in Coimbatore district, Tamil Nadu.

PRODUCTION

Production of emerald has not been reported since 1983. However, a single lease of 46.32 ha area was granted to M/s Serva Shri Mining & Mineral Industries in district Ajmer, Rajasthan in the year 1998.

MINING AND MARKETING

Mining of emerald was mostly undertaken manually by opencast method. The pits were worked at shallow depths. The stones collected during mining were sorted out according to size, shape and quality. The stones so collected were deposited with the State Government under the supervision of DMG officials and mine owners. Worldwide, crude emerald was sold through public auction from time to time.

The beauty of rough stone is enhanced by skilful cutting and polishing into faceted or rounded form for use in jewellery. The rough stones are sorted out to determine the angles to which facets can be cut. They may be sawed or polished in any direction according to shape, size and colour to be retained. After the shape and size are determined, the next process of 'pre-shaping' is done. The third and important process called 'calibration' gives the pre-shaped stone a definite proportion and size. The process that follows is 'faceting' and 'polishing'. The aim of this process is to achieve maximum internal reflection enhancing the beauty of stone. Emeralds are generally given a step-cut or cabochon-cut.

India is the leading exporter of cut and polished gem, but continued to depend on raw materials. The Diamond and Gem Development Corporation of India have set up Diamond and Gem Parks for cutting and polishing of gems in different states. Jaipur in Rajasthan is the major

**Table – 1 : Reserves/Resources of Emerald as on 1.4.2015
(By Grades/States)**

	Reserves				Remaining Resources				Total Resources (A+B)	
	Proved STD111	Probable STD121 STD122	Total (A)	Feasibility STD211	Pre-feasibility STD221 STD222	Measured STD331	Inferred STD332	Reconnaissance STD334		Total (B)
All India : Total	-	-	-	-	-	-	-	55869	55869	55869
By Grades										
Unclassified	-	-	-	-	-	-	-	55869	55869	55869
By States										
Jharkhand	-	-	-	-	-	-	-	55869	55869	55869

Figures rounded off.

centre for processing emeralds. Like diamonds, uncut emerald is imported and part of it is exported after processing. Emerald is next to diamond (uncut) amongst precious and semi-precious stones, being imported and re-exported after cutting and polishing.

Prices are governed by many factors including beauty, clarity, defect, demand, durability and rarity. Prices of precious stones also vary over time.

WORLD REVIEW

World production of emerald is reported mainly from Colombia, Pakistan, Afghanistan, Africa, Nigeria, Mozambique, United States of America, Madagascar, Brazil, Zambia and Zimbabwe.

Afghanistan

Afghanistan's Panjshir Valley has shown potentiality for commercial emerald production. The emerald mines of Afghanistan are located approximately 70 miles (113 km) northeast of Kabul and extend from the village of Khenj to Dest-e-Rewat. The emerald deposits lie South east of the Panjshir fault zone. The Panjshir emerald crystals vary in quality from mine to mine. In general, Panjshir emeralds are mined and marketed in a free-enterprise system.

Madagascar

Madagascar was a globally significant producer of gemstone that included emerald, ruby and sapphire. Emerald was produced from the Kianjavato emerald mines which are located in the rain-forest region of eastern Madagascar, approximately 60 km west of the coastal city of Mananjary. Emeralds are also mined at the Ianapera (Sakalava) emerald deposits in the Ianapera (Janapera) area of Tuléar (Toliara) Province, 350 km east of the town Toliara. Societe Orgaco of France mined the emerald (536 kg Heaven's gift) in matrix at the Morafeno mine near Mananjary and exported it to Reunion.

Pakistan

In Pakistan, the Fizzagat emerald mine is situated near the district headquarters Mingora in Swat valley.

Brazil

Since the 1970's, Brazil has been consistent source of emerald. Brazilian emerald deposits are found in a typical geological setting with Archean basement and supracrustal, ultramafic and granitoid rocks. Brazil emerald mines are located in the states of Bahia, Minas Gerais and Goias. Brazil's emerald production goes to both domestic cutting and foreign buyers who take the rough back to cutting centres in their own country.

Colombia

In Colombia, the mining activity of emerald has been concentrated in the departments of Cundinamarca and Boyaca, in the denominated East and West emerald belts. Mining districts of Chivor, Gachala and Macanal (Eastern Belt) and Muzo, Coscuez, Penas Blancas, La Palma-Yacoi and La Pita (Western Belt) are located in Colombia. The most representative mines are Muzo, Cunas, Coscuez, La Pita and Chivor.

Zambia

The majority of the gems produced in Zambia are found in the Kamakanga and Kagem mines. Both are located in the north-eastern region of the country. Gemfields, the world's biggest emerald miner has found a gem that weighs more than 1.1 Kg at its mine in Lufwanyama. Earlier 5,655 carat stone found at the Kagem Mines.

Others

Zimbabwe produces rough emeralds from the Sandawana mine, located in the south-west of the country. In the United States of America, in Beaver County, Utah rare red emeralds are found in the eastern slopes of the Wah Wah Mountains. In Ethiopia, a new deposit of high-quality emeralds has been found in the rural areas of Kenticha and Dermi, in the district Seba Boru. Mining still is done through hand tools, without heavy machinery.

FOREIGN TRADE

MMTC is an authorised agency of the Government of India for import of precious & semi-precious stones including emerald and supply these items to jewellers for domestic sales and exports.

Exports

In 2017-18 exports value of emerald (cut & uncut) decreased to ` 1,775 crore from ` 2,034 crore in the previous year. Exports were mainly to Hong Kong (54%), USA (18%) and Thailand & Switzerland (6% each). The share of uncut emerald decreased in total value from previous year and it was 3% during the year 2017-18 as compared to 11% from previous year and that of cut emerald was increased 97% during the year 2017-18 as compared to 89% of the previous year (Tables- 2 to 4).

Imports

In 2017-18 imports value of emerald (cut and uncut) decreased considerably by 31% to ` 11,342 crore compared to the previous year. The share of uncut emerald in total value was 51% and that of cut emerald was about 49% in 2017-18. Imports were mainly from Hong Kong (61%), Zambia (14%), UAE (6%), and Russia (3%) (Tables- 5 to 7).

**Table – 2 : Exports Value of Emerald
(Cut & Uncut) : Total
(By Countries)**

Country	(Value in ` '000)	
	2016-17	2017-18 (P)
All Countries	20340187	17757744
Hong Kong	10690622	9563359
USA	3128701	3168579
Thailand	1205566	1049585
Switzerland	1031226	1003930
UAE	1251751	642451
France	305514	415692
Zambia	395010	384714
Italy	421292	322976
Belgium	137279	269522
UK	307840	232579
Other countries	1465386	704357

Note: Quantity not given due to partial coverage; value figures, however, have full coverage.

**Table – 3: Exports of Emerald (Cut)
(By Countries)**

Country	2016-17		2017-18	
	Qty (`000 carat)	Value (` '000)	Qty (`000 carat)	Value (` '000)
All Countries	131357	18038499	42702	17155212
Hong Kong	31034	9809125	13273	9438527
USA	50336	3127934	13296	3158933
Thailand	11255	1168719	4910	1046078
Switzerland	469	1030248	371	1000986
UAE	430	715236	501	567307
France	220	305346	130	415584
Italy	5079	421147	1798	322868
Belgium	35	134876	15	269522
UK	17400	307840	3593	232579
Germany	3950	190653	806	118102
Other countries	11149	827375	4009	584726

EMERALD

**Table – 4: Exports of Emerald (Uncut)
(By Countries)**

Country	2016-17		2017-18	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
All Countries	2	2301688	16	602532
Zambia	++	393756	++	383231
Hong Kong	1	881497	1	124832
UAE	1	536515	++	75144
USA	++	767	15	9646
Thailand	++	36847	++	3507
Switzerland	++	978	++	2944
Germany	-	-	++	1025
Israel	++	70176	++	798
Estonia	++	104	++	587
Chinese Taipei/Taiwan	-	-	++	299
Other countries	++	381048	++	519

**Table – 5: Imports Value of Emerald
(Cut & Uncut)
(By Countries)**

(Value in ` '000)

Country	2016-17	2017-18 (P)
All Countries	113428795	77934749
Hong Kong	102738918	47377304
Zambia	1146990	10626882
UAE	3795533	4498171
Russia	99223	2693688
Thailand	2175781	2679789
USA	1541999	841971
Brazil	148571	599242
Singapore	822403	334293
Colombia	125310	325750
Other countries	834067	7957659

Note: Quantity not given due to partial coverage; value figures, however, have full coverage.

EMERALD

**Table – 6: Imports of Emerald (Cut)
(By Countries)**

Country	2016-17		2017-18	
	Qty (‘000 carat)	Value (` ‘000)	Qty (‘000 carat)	Value (` ‘000)
All Countries	96284	95179628	50546	38234809
Hong Kong	76670	89663528	22811	25080541
Thailand	14093	2052176	15388	2612098
UAE	1088	1227686	3808	2101420
USA	2755	1445181	459	769235
Sri Lanka	622	175514	1140	315276
Zambia	29	52971	121	136075
Singapore	2	19435	156	97750
Colombia	5	48204	16	76593
UK	35	89437	5	54517
Other countries	985	405496	6642	6991304

**Table – 7: Imports of Emerald (Uncut)
(By Countries)**

Country	2016-17		2017-18	
	Qty (t)	Value (` ‘000)	Qty (t)	Value (` ‘000)
All Countries	8	18249167	60	39699940
Hong Kong	6	13075390	17	22296763
Zambia	++	1094019	27	10490807
Russia	++	99223	1	2685249
UAE	1	2567847	2	2396751
Brazil	1	148571	13	589618
Colombia	++	77106	++	249157
Singapore	++	802968	++	236543
Ethiopia	-	-	++	121289
China	++	3749	++	89399
South Africa	-	-	++	85699
Other countries	++	380294	++	458665

Future Outlook

Gems and Jewellery export sector has been contributing about 13%-15% to India's total merchandise exports during the last five years. As per industry estimates, this sector employs more than 4.64 million employees. With a view to strengthen the Gems & Jewellery industry in the country, the Government has taken a number of steps such as establishment of Special Notified Zone (SNZ); announcement of separate ITC HS Code for lab-grown diamonds; introduction of Gold Monetisation Scheme; amendment of wastage and value addition norms for gems and jewellery

items; approved scheme for setting up of Common Facility Centres for gem and jewellery sector; and providing financial assistance for participation in international fairs, organising buyer-seller meets etc. under Market Development Assistance (MDA) and Market Access Initiative (MAI) Schemes of the Department of Commerce.

As per minutes of the Coordination-cum-Empowered Committee (CCEC) Meeting held on 12th October 2018, the Jharkhand State planned for auction of 2 blocks of emerald in FY 2018-19. It may boost the Indian Gems & Jewellery sector in near future.

