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## (Part- III : Mineral Reviews)

## 52nd Edition

# DIAMOND

## (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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# 13 Diamond

Diamond has been the most valuable among gems for more than 2,000 years.Diamond occurs in two types of deposits primarily in igneous rocks of basic or ultrabasic composition and in alluvial deposits derived from the primary sources. Its composition is pure carbon and has cubic crystal system and common form octahedron. India is known for its diamond cutting & polishing business especially for small sized diamonds. Most of the world's business comes to India, particularly to Surat in Gujarat. Indian diamond industry handles 80% of the global polished diamond market. India depends largely on imports of rough gem diamonds for its Cutting and Polishing Industry as there is only one producer in Madhya Pradesh and the production is negligible to meet the cutting and polishing industry's requirements. The cut and polished diamonds are re-exported. Being the hardest natural substance known, industrial variety diamonds are used in grinding, drilling, cutting and as polishing tool. In addition, diamond exhibits highest thermal conductivity amongst minerals and has high electrical resistivity making it suitable for application in semiconductors. The prices of gem diamonds depend upon their rarity, weight, quality, shape and flawlessness.

Diamond has a high refractive index and strong dispersion which gives it exciting brilliance when cut as a faceted stone. Gem diamonds are transparent and colourless or show faint shades of different colours. The transparent water-clear diamonds are known as "first water" or "blue-white". When yellowish or honey colour tinge is present, they are termed as off-colour stones. The industrial diamonds are dark brown in colour. Diamonds with green, blue or red shades are rare and attract higher price than the common varieties.

Flawless stones of good colour are abundently used in gem trade while off-colour, flawed & defective stones, chips & cuttings as well as small grains & dust are used in industry. Industrial grade diamond, i.e., diamond that does not meet gem quality standards in terms of colour, clarity, size or shape and those that are produced as a by-product of mining for gem diamonds continue to be used principally as abrasives in many applications despite their initial cost. Although diamond is more expensive than the other abrasive materials, it is more cost-effective in numerous industrial processes because it lasts longer than any other material.

Broadly, industrial diamonds have three varieties viz, 'ballas' which is mass of minute diamond crystals difficult to cleave; 'bort'; is yellowish grey to black colour and massive, flawed or irregular in shape and 'carbonado' is black, very hard opaque and without cleavage.

## RESOURCES

Diamond occurrences are reported since pre-historic times in the country. Presently, diamond fields of India are grouped into four regions:

1) South Indian tract of Andhra Pradesh, comprising parts of Anantapur, Cuddapah, Guntur, Krishna, Mahabubnagar and Kurnool districts;

2) Central Indian tract of Madhya Pradesh, comprising Panna belt;

3) Behradin-Kodawali area in Raipur district and Tokapal, Dugapal, etc. areas in Bastar district of Chhattisgarh; and

4) Eastern Indian tract mostly of Odisha, lying between Mahanadi and Godavari valleys.

As per the UNFC system as on 1.4.2010, all India resources of diamond are placed at around 31.92 million carats. Out of these, 1.04 million carats are placed under reserves category and 30.88 million carats under remaining resources category. By grades, about 2.37% resources are of gem variety, 2.63% of industrial variety and bulk of the resources (95%) are placed under unclassified category. By states, Madhya Pradesh accounts for about 90.20% resources followed by Andhra Pradesh 5.71% and Chhattisgarh 4.08% (Table-1).

## EXPLORATION & DEVELOPMENT

GSI continued exploration activities for search of kimberlite, the source rock of diamond, in Andhra Pradesh, Karnataka, Chhattisgarh and Maharashtra. Details of exploration activities by GSI are furnished in Table - 2.

**Table –1 : Reserves/Resources of Diamond as on 1.4.2010**
**(By Grades/States)**

(In carats)

| State/Grades | 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** | **1045318** | - | - | **1045318** | - | - | - | **304601** | **1524317** | **29047514** | - | **30876432** | **31921750** |
| **By Grades** | | | | | | | | | | | | | |
| Gem | - | - | - | - | - | - | - | 158819 | 1017 | 596929 | - | 756765 | 756765 |
| Industrial | - | - | - | - | - | - | - | 41664 | 223 | 798936 | - | 840823 | 840823 |
| Unclassified | 1045318 | - | - | 1045318 | - | - | - | 104118 | 1523077 | 27651649 | - | 29278844 | 30324162 |
| **By States** | | | | | | | | | | | | | |
| Andhra Pradesh | - | - | - | - | - | - | - | 200483 | 1524317 | 98155 | - | 1822955 | 1822955 |
| Chhattisgarh | - | - | - | - | - | - | - | - | - | 1304000 | - | 1304000 | 1304000 |
| Madhya Pradesh | 1045318 | - | - | 1045318 | - | - | - | 104118 | - | 27645359 | - | 27749477 | 28794795 |

*Figures rounded off*

**Table-2: Details of Exploration Activities for Diamond, 2012-13**

| 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** | | | | | | | |
| Mahabubnagar Rangareddy | Koilkonda-Devarakadra Block | - | 1440 | - | - | 160 | Reconnaissance stage (G-4) investigation was carried out for search of kimberlite/lamproite. An integrated structural map was prepared with the help of satellite imagery, aerial photographs, topo sheet and geological map, also structural trends of adjoining kimberlite areas were taken into consideration. Sediment samples, from trap sites of 2nd,3rd, 4th & 5th order streams were collected. Heavy mineral study indicated assemblages of magnetite, spinels, epidote, garnet, zircon, amphibole, ilmenite, goethite, hematite etc. A few ilmenite grains (KIM) were identified as Mn-ilmenite (pyrophanite) after EPMA examination. The Mn-ilmenites can be suspected as possible kimberlite indicator minerals. Additional stream samples were collected to target the source of Mn-ilmenite (kimberlite). The investigation has been completed. |
| Kurnool | Veligodu Chelima block | - | 720 | - | - | 150 | Reconnaissance stage (G-4) investigation was carried out for search of kimberlite/lamproite. The major heavy minerals recovered are magnetite, spinels, epidote, garnet, zircon, ilmenite,, hematite, and iron hydroxide. The stream sediment samples no.CH-8, CH-63& CH-150 yielded chrome spinel. Few of the analytical results of chrome spinel suggest it to be coming from close to diamond stability field. Close space traverse led to the discovery of a new lamproite body 3 km south of village Pachcharla and a small outcrop of lamproite in old working 3 km east of Sarva Narasimha Swami Temple. The investigation has been completed. |
| **Karnataka** | | | | | | | |
| Raichur Koppal Bellary | Maski Block | - | - | - | - | - | Reconnaissance stage investigation (G-4) was carried out to locate kimberlite in this area.The area is part of Archaean granite green-stone terrain of the Eastern Dharwar craton. Regional as well as detailed stream sampling were carried out. Samples were studied under binocular microscope and EPMA. No positive signature has been recorded for kimberlite indicator minerals. Investigations will be continued. |

(Contd.)

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 | | |
| **GSI** | | | | | | | |
| **Karnataka** | | | | | | | |
| Koppal Bellary | Tawergeri Block | - | - | - | - | - | Reconnaissance stage (G-4) investigation was carried out to search kimberlite through indicator mineral survey & geological traverses. Tawergeri block exposes rocks of Peninsular Gneissic Complex (PGC) comprising granod-iorite and granite. Regional as well as detailed stream sediment sampling were carried out from trap sides.Samples were processed for heavy minerals and studied under binocular microscope and EPMA for Kimberlite Indicator Minerals (KIM). No positive results for KIM were found. The investigation will be continued. |
| **Chhattisgarh** | | | | | | | |
| Dhamtari Kanker Durg | Raipur Field | - | - | - | - | - | Reconnaissance stage (G-4) investigation was taken up to locate kimberlite clan rock in the granitic basement along the high permeable zones characterised by mafic dykes. |
| -do- | Raipur Field | - | - | 700 | - | 190 | Reconnaissance survey was carried out around this area. Regional reconna-issance was conducted in the priority zone within mafic dyke swarms. Stream sediment samples were processed through HMS binocular studies & heavy minerals were seperated. PCS samples were chemically analysed. A total of 100 grains of garnet, ilmenite, spinel and pyroxene were analysed. The garnet grains were identified as almandine garnet. Investigation will be continued. |
| -do- | Raipur Field | - | - | - | - | 160 | Stream sediment samples were processed through heavy mineral separation procedure. Heavy minerals identified are garnet, ilmenite and spinel. Thin sections of PS samples were studied and the contact between Chhattisgarh sediments and crystallines was traced and zones of intersecting lineaments were identified for ground checks. 23 no of PCS samples were collected & 20 no of PCS samples were submitted for whole rock and trace element analysis. 50 grains of garnet, spinel, ilmenite and gem ruby including one thin section were studied by EPMA. The ruby grains are of high chrome bearing ($Cr_2O_3$up to 8% )& one grain of garnet has analysed 50.10% pyrope with MgO up to 12.94%. This garnet may help for search for kimberlite clan rock. One thin section was studied for mineral phases. The rock contains plagioclase (albite), clino pyroxene (chrome diopside with 0.38% $Cr_2O_3$), amphiboles, ilmenite and spinels indicating a deep source. The investigation will be continued. |

(Contd.)

Table-2 (Concld.)

| Agency/ State/ District | Location Area/ Block | Mapping | | Drilling | | Sampling (No.) | Remarks Reserves/Resources estimated |
|---|---|---|---|---|---|---|---|
| | | Scale | Area (sq km) | No. of boreholes | Meterage | | |
| **GSI** | | | | | | | |
| **Maharashtra** | | | | | | | |
| Nagpur & Bhandara | Tirodi Amgaon gneisses | - | - | - | - | 211 | Reconnaissance stage investigation (G-4) was carried out for search of kimberlite clan of rocks based on diamond indicator. The area exposes Tirodi Gnessic Complex in the southern part and Amgaon Gneissic Complex in the south eastern part. Rocks of Sausar Group are exposed in the northern part. Sulphide mineralisation (chalcopyrite & pyrite) was also observed.<br><br>Stream sediment samples were processed for heavy mineral separation.85 grains of red & light pink garnet, diopside and ilmenite were analysed by SEM-EDX. The garnet grains are of low magnesian variety while two grains show MgO content up to 7%. A diopside grain was identified however, no chrome diopside have been recovered. EPMA study will be done for another 35 grains of garnet, ilmenite and spinel.<br><br>The investigation has been completed. |

## PRODUCTION & STOCKS

Production of diamond at 31,989 carats in 2012-13 as against 18,490 carats in the previous year showed a steep rise of 73%. There were two operating mines, both in public sector located in Panna district of Madhya Pradesh. The one mine out of these two mines is operated by NMDC Ltd contributed almost the entire production of diamond while the other mine operated by Department of Geology and Mining, Government of Madhya Pradesh contributed comparatively to a smaller extent to the production.

Out of the total output, gem variety covering only rough & uncut constituted 8% and the remaining 92% was of industrial grade covering both off -colour and dark brown varieties. (Tables 3 to 5).

Mine- head stocks at the beginning of the year were 16,814 carat as against 18,844 carat at the end of the year (Table-6).

The average daily employment of labour during 2012-13 was 180 as against 167 in the previous year.

## Table – 3: Principal Producer of Diamond, 2012-13

| Name & address of producer | Location of Mine | |
|---|---|---|
| | State | District |
| National Mineral Development Corporation Ltd<br>10-3-311-/A, Castle Hills,<br>Masab Tank,<br>Hyderabad-500 028,<br>Andhra Pradesh. | Madhya Pradesh | Panna |
| Directorate of Geology & Mining,<br>Government of Madhya Pradesh,<br>Khanij Bhavan, 29-A, Arera Hill,<br>Bhopal - 462 016,<br>Madhya Pradesh. | Madhya Pradesh | Panna |

## Table – 4 : Production of Diamond, 2010-11 to 2012-13 (By State)

(Quantity in carats; value in ₹'000)

| State | 2010-11 | | 2011-12 | | 2012-13(P) | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| **India** | **11222** | **106776** | **18490** | **198240** | **31989** | **366471** |
| Madhya Pradesh | 11222 | 106776 | 18490 | 198240 | 31989 | 366471 |

## Table – 5 : Production of Diamond, 2011-12 to 2012-13 (By Sector/State/District/Grades)

(Quantity in carats; value in ₹'000)

| State/District | 2011-12 | | | | | 2012-13(P) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. of mines | Quantity | | | Value | No. of mines | Quantity | | | Value |
| | | Gem (rough & uncut) | Industrial* | Total | | | Gem (rough & uncut) | Industrial* | Total | |
| **India** | **2** | **1479** | **17011** | **18490** | **198240** | **2** | **2559** | **29430** | **31989** | **366471** |
| Public sector | 2 | 1479 | 17011 | 18490 | 198240 | 2 | 2559 | 29430 | 31989 | 366471 |
| **Madhya Pradesh** | **2** | **1479** | **17011** | **18490** | **198240** | **2** | **2559** | **29430** | **31989** | **366471** |
| Panna | 2 | 1479 | 17011 | 18490 | 198240 | 2 | 2559 | 29430 | 31989 | 366471 |

** Includes off-colour and dark-brown varieties of diamond.*

## Table – 6 : Mine-head Stocks of Diamond, 2012-13 (P) (By State)

(In carats)

| State | At the beginning of the year | At the end of the year |
|---|---|---|
| **India** | **16814** | **18844** |
| Madhya Pradesh | 16814 | 18844 |

# MINING & PROCESSING

Majhgawan in Madhya Pradesh, which is a fully mechanised mine operated by National Mineral Development Corporation Ltd,. It is worked by opencast method in tuff rock by deploying 4.1 cu. m. hydraulic shovel and 40-tonne dumpers in combination. The mine benches have been designed with a height of about 10 m. Few benches are of 4-5 m height. Drilling is done by 4-inch diameter drills and charged with slurry explosives, and about 40-50 holes are blasted at a time with delay pattern. The capacity of the mine is about 30,000 carats per year. Diamonds are also recovered from conglomerate and gravel beds at shallow depths by small operations on the basis of annual permits granted by Diamond Officer, Government of Madhya Pradesh. At Majhgawan, kimberlite rock after mining is stock piled for weathering action and then is fed to crushing plant. It is processed through Heavy Media Separation System in processing plant for recovery of diamond. Recently, X-ray diamond sorter has been installed for sorting of diamonds from ore and this has increased the recovery of raw diamonds to 98%.

## Diamond Mining Factors

**Grade:** Grade is the weight of diamond expressed as carats per tonne (ct/t) of ore. It varies widely from one mine to another but generally falls somewhere between 0.3 and 1.3 ct/t. One carat is equivalent to 0.2 grams.

**Size (weight) of rough diamonds in deposit:** Individually, rough diamonds can range from microweight to stones weighing more than 1,000 carats. Depending on the mine, the average size of rough diamond recovered can weigh from 0.01 ct (about 1 mm) to more than 0.7 ct. Many mines in the world show an average of about 0.4 to 0.5 ct per stone. It is interesting to note that the number of stones larger than 2 ct (0.4 g) produced at mines are very small (about 400,000 stones per year).

# INDUSTRY

Indian Diamond Industry enjoys credible standing and reputation in the world market, particularly for small diamonds used in jewellery. Indian diamond manufacturing standards are reckoned as the best in the world. Workmanship & skill of Indian artisans at polishing small diamonds economically and efficiently has been widely acknowledged. India may become a Trading Centre for rough and polished diamonds in the near future. Surat in Gujarat is the main centre of the Cutting and Polishing Industry.

There are over 10,000 diamond processing units in Surat. Most of them now use computerised cutting machines. With 800,000 strong workforce and deployment of the latest technology, India continues to be the dominant player in the world Diamond Cutting and Polishing industry. According to India's Gem & Jewellery Export Promotion Council (GJEPC), India has further strengthened its world dominance.

India's predominance as leader in the world market is due to a combination of pragmatic policies of the Government and sustained efforts of exporters. Policy changes, such as, creation of Special Economic Zones (SEZ) is expected to boost the export prospects further. Several diamond polishing companies have already established offices in India for trading in rough & polished diamonds. India obtains rough diamonds from Belgium, UK, Hong Kong, UAE, Israel, etc. Indian diamond traders seek opportunities to establish direct trade ties with mining countries and companies. The expections of the Indian diamond industry are to access rough diamonds at competitive rates directly from the producers to maintain its lead in the world market.

# CONSUMPTION

Industrial diamonds are mostly consumed by manufacturers of drill bits, grinding tools and stone cutting & polishing machines. There are many small-scale sector units that operate in cutting & polishing trade. Therefore there is an apparent issue of obtaining reliable data on consumption of industrial diamonds. Demand of industrial diamonds is mostly met by imports.

# SUBSTITUTES

**Synthetic Diamond**

Today, market for industrial diamond is dominated by synthetic stones, first developed in 1950s. Synthetic diamonds, manufactured using high pressure and high temperature methods compete as an abrasive mineral with natural industrial diamonds and also with manufactured materials like silicon carbide (SiC), alumina ($Al_2O_3$), tungsten carbide (WC) and carbide boron nitrate (CBN). Synthetic diamonds being marketed are mostly 0.6 - 0.8 mm and smaller in size. Synthetic Diamond Abrasives (SDA) are used for sawing, drilling or milling hard stones, concrete aggregate, refractory materials, masonry and asphalt. In general, large crystals are used for cutting softer materials and smaller crystals for tougher jobs. Synthetic diamonds now account for bulk supply of industrial diamonds and are preferred over natural diamonds because their quality can be controlled to suit customer's requirements.

Synthetic diamonds were produced earlier by using graphite with a metal catalyst under very high pressure & temperature.

Of late a new process, such as,chemical vapour deposition (CVD)has been evolved which require relatively low pressure for production of synthetic diamonds. This process involves depositing tiny crystals of diamond on a film which can be built in complicated shapes and used at desired places or instruments such as machine part, heat conductors in micro circuit, shortwave UV, microwave sources and radiation detectors. In future, CVD can be a substitue for silicon in Computer Industry. In USA, developments have taken place in CVD method of growing 100% pure diamond using microwave plasma technology. This method is more economical, and also enables production of larger crystals.

## TRADE POLICY

Import of diamond under HS Code 7102, whether or not worked, but not mounted or set, fall under `free' category as per the Export-Import Policy 2009-2014. Foreign Direct Investment (FDI) in diamond mining up to 100% is admissible for automatic approval of Reserve Bank of India.

## WORLD REVIEW

The world reserves of industrial diamond are about 750 million carats located mainly in Australia (36%),Congo (Kinshasa) (20%), Botswana (17%), South Africa (9%) and Russia (5%). The world reserves of diamond are given in Table-7.

The total world production of diamond increased marginally by 2% from 124 million carats in 2011 to 127 million carats in 2012.

The principal producers were Russia (27%), Botswana & Democratic People's Rep. of Congo (16% each), Zimbabwe (9%),Canada (8%), Australia & Angola (7% each) & South Africa (6%). During the year, increase in the diamond production of Sierra Leone (49%), Zimbabwe (42%), Australia (14%), Congo (5%) and South Africa (3%) was observed. While decrease in the diamond production of Ghana (24%),Botswana (11%) and Canada (2%) was noticed. Natural diamonds are cut in 52 countries. The major diamond cutting centres in the world are Antwerp in Belgium, Ramatyyan in Israel, New York in USA and Surat in India (Table-8).

**Table – 7 : World Reserves of Diamond (Industrial) (By Principal Countries)**

(In million carats)

| Country | Reserves |
|---|---|
| **World : Total (rounded)** | **750** |
| Australia | 270 |
| Congo (Kinshasa) | 150 |
| Botswana | 130 |
| Russia | 40 |
| South Africa | 70 |
| USA | NA |
| Other countries | 90 |

***Source:*** *Mineral Commodity Summaries, 2014.*

**Table – 8 : World Production of Diamond (By Principal Countries)**

(In '000 Carats)

| Country | 2010 | 2011 | 2012 |
|---|---|---|---|
| **World: Total** | **129200** | **123700** | **127300** |
| Angola | 8362 | 8329 | 8331 |
| Australia | 9998 | 7562 | 8626 |
| Botswana | 22019 | 22903 | 20478 |
| Canada | 11773 | 10795 | 10529 |
| Central African Rep. | 302 | 324 | 366 |
| China[e] | 1100 | 1100 | 1100 |
| Congo, Dem.P.R. | 20166 | 19249 | 20140 |
| Ghana | 309 | 283 | 215 |
| Guinea | 374 | 235 | 267 |
| Lesotho | 109 | 224 | 479 |
| Namibia | 1522 | 1345 | 1667 |
| Russia | 34857 | 35140 | 34928 |
| Sierra Leone | 437 | 356 | 532 |
| South Africa | 8871 | 7047 | 7245 |
| Zimbabwe | 8435 | 8503 | 12060 |
| Other countries | 566 | 305 | 337 |

***Source:*** *World Mineral Production, 2008-2012.*

Worldwide diamond exploration spending increased by 16% in 2012. Africa was the leading diamond exploration location.

Two new diamond projects were commissioned in 2012. The Karowe Mine in Botswana began operation and the expansion of the Koidu Mine in Sierra Leon.

### Botswana

Commissioning of Lucara Diamond Corporation's Karowe Mine was completed in May 2012 and commercial production began in July 2012.

### Canada

Diamond exploration continued in Canada with several commercial diamond projects and additional discoveries in Alberta, British Columbia, the Northwest Territories, the Nunavut Territory, Ontario & Quebec.

The Ekati Diamond mine, Canada's first operating diamond mine completed 14 years of production in 2012. Ekati produced 1.45 Mct of diamond from 4.24 million tonnes of ore. Harry Winston Diamond Corp entered into an agreement with BHP Billiton Canada Inc. to purchase BHP Billiton's diamond assets,which included its 80% share in Ekati Diamond Mine.

The Diavik Diamond Mine,Canada's second diamond mine located in Northwest Territories completed its ten years of production. Diavik produces an average of 2 million tonnes of ore per year with an average of 3.1 carats per tonne. Diavik estimated the mine's remaining proven and probable reserves to be 18.3 Mt of ore at an average grade of 2.9 carat/tonne of diamond and projected total mine life to be 16 to 22 years. Diavik completed the construction of the underground mine.

The Snap Lake Mine, in the Northwest Territories is wholly owned by De Beers Canada Inc. The Snap Lake deposit is a tabular-shaped kimberlite dyke rather than the typical kimberlite pipe. The dyke is 2.5 m thick and dips at an angle of $12^0$ to $15^0$.

The Victor mine, in northern Ontario on the James Bay coast is wholly owned by De Beers Canada. The Victor kimberlite consists of two pipes with surface area of 15 hectares. The mineable reserves are estimated to be 27.4 million tonnes with average grade of 0.23 carats per tonne. Mine life is estimated to be 12 years.

## Sierra Leone

An expansion of the Koidu Mine, wholly owened by Koidu Holdings SA, involved the redevelopment of the K1 kimberlite pipe and commissioning of a new plant to increase capacity to 500,000 carat per year from 120,000 carat per year. The plant was commissioned in September 2012.

# FOREIGN TRADE

## Exports

Value of exports of diamond decreased about 6% to ₹1,26,655 crore in 2012-13 against₹1,34,239 crore in the previous year. Diamond (mostly cut) alone accounted for almost cent-percent exports in terms of value. The share of industrial diamonds and diamond powder was ₹12 crore and ₹77 crore, respectively. Exports were mainly to Hong Kong (35%), USA (22%), UAE (19% ), Belgium (10%) and Israel (5%) (Tables- 9 to 12).

## Imports

In 2012-13, imports value of diamond decreased by 11% to ₹1,17,699 crore from ₹1,32,292 crore in the previous year. Uncut diamond shared the bulk, i.e., almost cent- percent of imports. Imports of industrial diamond and diamond powder were about 53 thousand carats and 181 million carats, respectively, valued at ₹8 crore and ₹23 crore. Imports were mainly from Belgium (38%), UAE (25%), Hong Kong (16%), UK & Israel (6% each) andUSA (4%) (Tables -13 to 16).

**Table – 9 : Exports Value of Diamond : Total (By Countries)**

| Country | 2011-12 | 2012-13 |
|---|---|---|
| | Value (₹'000) | Value (₹'000) |
| **All Countries** | **1342392353** | **1266550703** |
| Hong Kong | 428166403 | 449444408 |
| USA | 241796994 | 275949128 |
| UAE | 298683944 | 234849822 |
| Belgium | 158094427 | 122222958 |
| Israel | 69554801 | 62569586 |
| Thailand | 26210175 | 31471059 |
| Japan | 15458428 | 16699545 |
| Singapore | 11399391 | 14719900 |
| UK | 9230857 | 10065458 |
| Switzerland | 14994062 | 9063570 |
| Other countries | 68802871 | 39495269 |

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

**Table – 10 : Exports of Diamond (Industrial) (By Countries)**

| Country | 2011-12 | | 2012-13 | |
|---|---|---|---|---|
| | Qty (carats) | Value (₹'000) | Qty (carats) | Value (₹'000) |
| **All Countries** | **251923** | **156935** | **1709350** | **117214** |
| Belgium | 81863 | 37423 | 390921 | 23063 |
| USA | 52850 | 5325 | 364411 | 21946 |
| Ireland | 27350 | 1756 | 229320 | 15985 |
| UK | 3700 | 1348 | 298816 | 15159 |
| Hong Kong | - | - | 137599 | 14013 |
| China | 71500 | 6729 | 101000 | 9961 |
| Israel | - | - | 120001 | 7446 |
| Japan | - | - | 10065 | 3237 |
| Thailand | 30 | 973 | 221 | 1557 |
| Unspecified | 13187 | 100326 | 29500 | 1797 |
| Other countries | 1443 | 3055 | 27496 | 3050 |

## Table – 11 : Exports of Diamond (Mostly Cut) (By Countries)

| Country | 2011-12 | | 2012-13 | |
|---|---|---|---|---|
| | Qty (carats) | Value (₹'000) | Qty (carats) | Value (₹'000) |
| **All Countries** | **62654023** | **1338809004** | **65425281** | **1265658948** |
| Hong Kong | 22343326 | 427346588 | 20840372 | 449308137 |
| USA | 7018321 | 241427273 | 6506620 | 275841708 |
| UAE | 15766370 | 297672412 | 20165285 | 234685990 |
| Belgium | 8552023 | 157351086 | 9413989 | 122134968 |
| Israel | 1519569 | 69466381 | 1610302 | 62553100 |
| Thailand | 1386166 | 26163068 | 1382986 | 31456659 |
| Japan | 1404663 | 15281803 | 1207298 | 16576970 |
| Singapore | 455559 | 11398426 | 478355 | 14717853 |
| UK | 1416122 | 9129354 | 1808227 | 10022109 |
| Switzerland | 374572 | 14992672 | 222475 | 9062086 |
| Other countries | 2417332 | 68579941 | 1789372 | 39299368 |

## Table – 12 : Exports of Diamond (Powder) (By Countries)

| Country | 2011-12 | | 2012-13 | |
|---|---|---|---|---|
| | Qty ('000 carats) | Value (₹'000) | Qty ('000 carats) | Value (₹'000) |
| **All Countries** | **22334** | **3426414** | **9518** | **774541** |
| UAE | 3890 | 1011532 | 2418 | 163832 |
| Hong Kong | 2739 | 819815 | 927 | 122258 |
| Japan | 494 | 176625 | 661 | 119338 |
| USA | 4182 | 364396 | 1622 | 85473 |
| Belgium | 4862 | 705918 | 743 | 64927 |
| UK | 2436 | 100155 | 1507 | 28190 |
| Germany | 446 | 34574 | 350 | 24323 |
| Thailand | 631 | 46134 | 32 | 12844 |
| Israel | 961 | 88420 | 40 | 9040 |
| Unspecified | 49 | 3183 | 752 | 120355 |
| Other countries | 1644 | 75662 | 466 | 23961 |

## Table – 13 : Imports Value of Diamond : Total (By Countries)

| Country | 2011-12 | 2012-13 |
|---|---|---|
| | Value (₹'000) | Value (₹'000) |
| **All Countries** | **1322922157** | **1176986143** |
| Belgium | 393009325 | 449040529 |
| UAE | 349880800 | 298409812 |
| Hong Kong | 327618906 | 189120473 |
| UK | 66066841 | 65276162 |
| Israel | 61358151 | 64839140 |
| USA | 54329294 | 43294336 |
| Russia | 30132349 | 36619340 |
| Canada | 10184782 | 9065920 |
| Switzerland | 4801937 | 6655825 |
| Botswana | 2246311 | 2978894 |
| Other countries | 23293461 | 11685712 |

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

**Table – 14 : Imports of Diamond (Industrial) (By Countries)**

| Country | 2011-12 | | 2012-13 | |
|---|---|---|---|---|
| | Qty (carats) | Value (₹'000) | Qty (carats) | Value (₹'000) |
| **All Countries** | **18681** | **56644** | **53045** | **81581** |
| UAE | 30 | 337 | 22551 | 35844 |
| Belgium | 8484 | 17106 | 9056 | 17019 |
| Hong Kong | 712 | 11300 | 19537 | 12576 |
| Congo, P.Rep. | 5884 | 7512 | 1428 | 11746 |
| South Africa | 1082 | 3734 | 259 | 2873 |
| Japan | - | - | 161 | 1124 |
| UK | 542 | 834 | 23 | 199 |
| Ireland | 16 | 80 | 30 | 199 |
| Other countries | 1931 | 15741 | ++ | 1 |

**Table – 15 : Imports of Diamond (Powder) (By Countries)**

| Country | 2011-12 | | 2012-13 | |
|---|---|---|---|---|
| | Qty ('000carats) | Value (₹'000) | Qty ('000carats) | Value (₹'000) |
| **All Countries** | **204315** | **1055859** | **181550** | **1226478** |
| China | 172236 | 616091 | 157180 | 908416 |
| Ireland | 9118 | 84852 | 6616 | 83879 |
| USA | 6153 | 44684 | 4509 | 54621 |
| Korea, Rep.of | 4506 | 38140 | 4057 | 42022 |
| UAE | 800 | 4010 | 1410 | 21551 |
| Belgium | 1907 | 172207 | 1668 | 20218 |
| Hong Kong | 1375 | 13055 | 1166 | 19959 |
| Germany | 3290 | 22793 | 703 | 12751 |
| Switzerland | 917 | 10542 | 611 | 11706 |
| South Africa | - | - | 500 | 11397 |
| Other countries | 4013 | 49485 | 3130 | 39958 |

**Table – 16 : Imports of Diamond (Mostly Uncut) (By Countries)**

| Country | 2011-12 | | 2012-13 | |
|---|---|---|---|---|
| | Qty (carats) | Value (₹'000) | Qty (carats) | Value (₹'000) |
| **All Countries** | **152810849** | **1413472460** | **135729330** | **1175678084** |
| Belgium | 60944564 | 392820012 | 64892361 | 449003293 |
| UAE | 37273404 | 349876453 | 32307263 | 298352417 |
| Hong Kong | 25431233 | 327594551 | 11973772 | 189087938 |
| UK | 10213257 | 66063293 | 9494693 | 65265820 |
| Israel | 4725527 | 61358151 | 3988658 | 64838014 |
| USA | 3774535 | 54283154 | 3499595 | 43239715 |
| Russia | 5978814 | 30118795 | 5731743 | 36619340 |
| Canada | 2347826 | 101847562 | 2330103 | 9065920 |
| Switzerland | 280362 | 4791395 | 675349 | 6644119 |
| Botswana | 118286 | 2246311 | 44831 | 2978894 |
| Other countries | 1723041 | 22472783 | 790962 | 10582614 |

## FUTURE OUTLOOK

Private companies like De Beers India and Rio Tinto India, based on the good geological database provided by GSI, were granted RPs for diamond exploration. The total area covered under RP is 140,000 sq km. The major focus was in the states of Andhra Pradesh, Chhattisgarh, Karnataka and Madhya Pradesh.

The diamond industry in the country currently employs over 8 lakh artisans who are experts in cutting and polishing of small diamonds and are now in a position to process full range of sizes and qualities of gemstones using latest technology.

The Indian Cutting & Polishing Sector is facing growing competition from China due to the fact that the diamond producing African countries are demanding a greater share for processing of roughs within their countries. Thus, according to a KPMG analysis, by 2015, India's share in value terms will come down to 49.3% of the world diamond roughs from the present 65%. In the same period China's share is expected to grow to 21.3%, Russia to 7.1%, South Africa to 5.5%, Israel to 4.7% and the US to 1.4%.