

MARBLE



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MARBLE

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**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES**

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Marble is a 'minor mineral' as defined in Clause (e) of Section 3 of Mines and Minerals (Development & Regulation) Act, 1957. The term "marble" is derived from the Latin word *Marmor* which in turn is said to have been coined from Greek word *Marmorous*, meaning shining stone. It is known for its pleasant colours, smooth and uniform texture, moderate hardness, amenability to be quarried into big blocks, smooth & shiny polished surface and silky feel. Marble occupies a unique position among other dimension stones because of its aesthetic value.

In terms of geological definition, it is a metamorphosed limestone produced by recrystallisation under condition of thermal and also regional metamorphism. In commercial parlance, all calcareous rocks capable of polish are classed as marbles. Furthermore, serpentine rocks, containing little calcium or magnesium carbonates, if attractive and capable of taking good polish are also classed as marbles. The calcareous stones like onyx, travertine and some limestone have also been classed as marbles. Marble is not a prime export commodity like the dimension stone and granite. Its internal demand has always remained high and most of the production added with recent increase in imports is consumed within the country. Marble is

the most preferred stone in India among all dimension stones. Most of the units in the marble industry are in the small scale sector.

RESOURCES

The occurrences of marble have been reported from many states, viz, Rajasthan, Gujarat, Haryana, Andhra Pradesh, Madhya Pradesh, Jammu & Kashmir, Maharashtra, Sikkim, Uttar Pradesh and West Bengal. Among the above states, marble deposits of economic importance are localised in Rajasthan, Gujarat, Haryana, Andhra Pradesh and Madhya Pradesh.

Rajasthan has the distinction of having the best among Indian resources of good quality marble. Out of 32 districts, 20 districts have marble in one or the other form. The important regions of marble occurrences in Rajasthan are:

- i) Udaipur - Rajsamand - Chittorgarh region;
- ii) Makrana - Kishangarh region;
- iii) Banswara - Dungarpur region;
- iv) Andhi (Jaipur) - Jhiri (Alwar) region; and
- v) Jaisalmer region.

The important deposits of marble in Rajasthan are given in Table - 1.

Table – 1 : Important Deposits of Marble in Rajasthan

Sl.No.	Name of deposit	District
i)	Agaria, Amet, Kilwa, Morwad, Dharmita, Katre, Parvati Koyal, Morchana, Arana, etc.	Rajsamand
ii)	Makrana, Borawad (White), Chosira Dwagri (Pink), Kumari	Nagaur
iii)	Kesariaji (Rikhabdeo), Odwas	Udaipur
iv)	Babarmal (Devimata), Rajnagar	Udaipur
v)	Tripura Sundari-Talai-Odabagi-Bhimkund-Vithaldeo, Prithvipura, Paloda, etc.	Banswara
vi)	Andhi, Bhainslana, Todi-ka-Bas	Jaipur
vii)	Jhiri, Sariska, Rajgarh, Badampur, Moti-Dungri, etc.	Alwar
viii)	Selwara-Dhanwar-Koteswar	Sirohi
ix)	Jahazpur, Kekri, Manoharpur, Asind, Banera, Shahpura	Bhilwara
x)	Kalyanpur-Narwar-Sardhana	Ajmer
xi)	Patan-Rampura, Kela-Dungari	Sikar
xii)	Dagota	Dausa
xiii)	Umar	Bundi
xiv)	Sabla, Nandli-dad, Peeth, Manpur, Dachki, etc.	Dungarpur
xv)	Mandal, Deh	Chittorgarh
xvi)	Pachori Chadi, Moriya Munjasar, etc.	Jodhpur
xvii)	Bar-Sendra Sarangwa, Sevari, Kundal	Pali
xviii)	Dunkar, Bidasar, Dujara	Churu
xix)	Mooisagar, Amarsagar, Habur, Naripa	Jaisalmer

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The marbles of Rajasthan are in various colours and shades. The Makrana area is famous for pure white crystalline marble. Other varieties found in Makrana area are Albata, Adanga, Dongri Pink, etc. The marble from Rajsamand area is mined extensively. It is off-white and greyish-white. The internationally acclaimed variety of green marble comes from Rikhabdeo-Kesariaji area, 60 km away from Udaipur. The green marble has various shades of green with white and black network and patches. The marble from Babarmal is pink and is marketed as Indian Pink. It is a fine-grained hard marble having black and white bands. The marble from Bhilwara is white to off-white, fine to medium-grained hard marble having black and white bands. The marble from Banswara is white to off-white dolomitic marble and is soft. It is used generally for cladding purpose. The white to greyish-white marbles of Jaipur area are being sold under the trade name Andhi Pista, a white marble having green laths of serpentine; onyx; Indo-Italian and Black Marble. The Bhainslana marble is dark-black.

Gujarat has vast resources of marble in Banaskantha, Bharuch, Vadodara, Kachchh and Panchmahal districts. The Ambaji area in Banaskantha district and Chinchpura area in Vadodara district are the main producing centres. The white marble of Ambaji is known for its amenability to carving. Other deposits in Banaskantha district are Jarivav, Kumbharia, Kateswar, Bheroj and Khikla. Marble of Vadodara district occurs in various shades, viz, green, white, pink and cream. Marble of Bharuch varies in colour from black to green and red. The yellow marble of Kachchh is thin-bedded, sometimes fossiliferous and blockable deposits occur at Bhulawara-Chinchpura belt.

In Haryana, marble deposits are located in the district of Mahendragarh. Most important localities are Antri-Beharipur, Zainpur, Chappra-Bibipur, Nangaldurgu, Islampur and Dhanota-Dhancholi. Marble of this area occurs in variegated colours and banded forms. It enjoys the reputation as 'Patiala Marble' with black and white bands.

Of late, the world-famous marble rocks 'Bhedaghat' near Jabalpur in Madhya Pradesh have attracted entrepreneurs from Rajasthan. The extension of these rocks located in between Jabalpur and Katni is being quarried. The marble from these

areas is exploited for its off-white, fine-grained, banded attributes. A number of quarries are under operation.

Marble deposits of Maharashtra are of calcitic and dolomitic type which are located in the areas of Katta-Hiwara, Kadbikhera, Sakaritola, Pauni, Chorbaoli, Deolapar, Mansar, Kandri, Chargaon, Junewani villages in Nagpur district. In Katta-Hiwara, the marble is light-pink to grey in colour. The marble of Kadbikhera-Sakaritola is pink calcitic marble while the marble deposits of Mansar and Kandri areas are dolomitic type.

In Uttarakhand, thick impersistent bands of white marble occur in massive limestone in Pithoragarh district.

In Mirzapur district of Uttar Pradesh, two marble deposits at Hingha and Geria are of good quality and can yield blocks for limited requirement.

In Jharkhand, huge deposits of marble are available in Semra-Salatua and adjoining areas of Palamau. Pink marble occurrences are reported from Hesadih area, Singhbhum district.

The marbles of Khammam area Andhra Pradesh are white and green. Occurrences of pink, purple, yellow and variegated marbles are reported in Cuddapah, Kurnool and Anantapur districts. The dolomitic marble of Cuddapah, Kurnool and Anantapur districts is other upcoming resource centre for off-white, coloured, greyish-black marbles which take good polish and are being exploited by private entrepreneurs.

On the basis of available data, IBM has prepared a mineral inventory of marble reserves and resources as per UNFC system as on 1.4.2010 which is furnished in Table - 2. The total resources of all grades of marble are placed at 1,931 million tonnes. Of these, only about 276 million tonnes (14%) fall under 'reserve' category and about 1655 million tonnes (86%) under 'remaining resources' category. Gradewise, about 27% resources fall under unclassified and not-known grades, 55% under off-colour grade and 17% under white colour grade. The available data on marble resources reveal that about 64% resources are in Rajasthan and 21% in Jammu & Kashmir. The remaining resources are distributed mainly in Gujarat, Chhattisgarh, Maharashtra, Haryana, Uttarakhand and Sikkim in descending order.

**Table – 2 : Reserves/Resources of Marble as on 1.04.2010
(By Grades/States)**

(In 000' tonnes)

State/Grade	Reserves				Remaining resources							Total resources (A+B)	
	Proved STD111	Probable		Total A	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Interred STD333	Reconnaissance STD334		Total B
		STD121	STD122			STD221	STD222						
All India : Total	103736	172661	98	276495	-	29842	72289	-	107129	1445708	-	1654968	1931463
By Grades													
White Colour	72700	124504	-	197204	-	-	81	-	-	133442	-	133523	330727
Off Colour	31036	48059	-	79095	-	27805	48352	-	107129	809104	-	992390	1071485
Unclassified	-	-	-	-	-	-	21870	-	-	498512	-	520382	520382
Not-Known	-	98	98	196	-	2037	1986	-	-	4650	-	8673	8869
By States													
Andhra Pradesh	-	-	-	-	-	-	-	-	-	3	-	3	3
Chhattisgarh	-	-	-	-	-	-	-	-	-	83000	-	83000	83000
Gujarat	-	-	-	-	-	26571	45000	-	17129	34871	-	123571	123571
Haryana	-	-	-	-	-	1234	1602	-	-	19492	-	22328	22328
Jammu & Kashmir	-	-	-	-	-	-	-	-	-	404703	-	404703	404703
Maharashtra	-	324	-	324	-	-	81	-	-	57642	-	57723	58047
Rajasthan	103736	172337	98	276171	-	2037	25606	-	90000	837615	-	955258	1231429
Sikkim	-	-	-	-	-	-	-	-	-	2382	-	2382	2382
Uttarakhand	-	-	-	-	-	-	-	-	-	6000	-	6000	6000

Figures rounded off.

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PRODUCTION

The total production value of marble increased to 1601.24 crore in 2011-12 from 1395.42 crore in 2010-11. Rajasthan alone accounted for about 95 % output value followed by Gujarat and Madhya Pradesh 2% each & Andhra Pradesh 1% while that of Jammu & Kashmir value of production is negligible (Table - 3).

MINING AND PROCESSING

Mining of marble or, for that matter, any dimension stone is different from conventional mining practices. In conventional mining method, mined out minerals are obtained in small-size fractions whereas in dimension stone mining, large-size intact blocks without minor cracks or damages are extracted.

Marble mining in India is quite old and has been perfected by trial and error method for extracting larger blocks by manual means. Advent of advanced mining machinery and improved methods of cutting and mining have largely transformed the marble mining methods and have led to increased production. Presently, mining of marble is done by manual, semi-mechanised and mechanised means. But in general, majority of mines adopt the semi-mechanised method of mining. The various stages in mining marbles are as follows:

The removal of overburden is generally carried out with heavy earth-moving machinery. In some cases, the weathered zone is removed by drilling holes by jackhammers and slim drill machines. These holes are charged with explosives and under

controlled blasting methods, the overburden material is loosened out. It is then removed using heavy earth-moving machinery, such as excavators, tippers and loaders.

After removal of overburden and capping, the marble is exposed at suitable places. After studying the topography and keeping in view the further development of quarry, a key block is marked for removal or for quarry front cut. At this stage, it is necessary to study the joint or fracture pattern in order to ascertain recovery of large-size block.

In manual operation, a line of shallow holes is made and by driving in wedges with feathers by continuous hammering, a fracture is developed along the already drilled holes, and the block is made free from all the sides. The block thus freed from the in situ rock is either pulled by chains or pulley system or is pushed by driving logs, etc. After the block is toppled, it is again cut and dressed for getting a parallel-piped shape.

In the semi-mechanised operation, jackhammers, slim drills, line drilling machines are used for drilling holes in a predetermined line. The remaining operation is more or less similar to manual mining except for lifting and pulling where cranes, winches, dozers, etc. are used. But in the above mentioned processes, the wastage is high and the size of the blocks recovered is small and seldom free from defects. However, to overcome these problems, the quarry front cut is made by using slim drill machines, diamond wire saw, quarry master, diamond belt saw machines and chain saw machines.

**Table – 3: Value of Production of Marble, 2009-10 to 2011-12
(By States)**

State	2009-10	2010-11	2011-12 (P)
India	12794100	13954172	16012403
Andhra Pradesh	170	138	81534
Gujarat	422610	136248	399729
Jammu & Kashmir	96	539	295
Madhya Pradesh	290965	344304	358015
Rajasthan	12080259	13472943	15172830

Source: State Governments.

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The slim drill machines and quarry masters are used to drill holes through which diamond wire saw is passed and the block is cut by continuous motion of the diamond wire saw. Once the block is cut, it is toppled with the help of hydrobags, pneumatic pillows, air-jacks, etc. The blocks cut this way are of exact sizes with minimum losses. The lifting and loading of blocks are done by Derrick cranes and using various types of loaders.

Processing of marble is done in two stages. The first stage of processing involves cutting the blocks into 2 to 3 cm thick slabs by using gang saws, wire saws and circular saws. In marble tile plant, the required thickness of tiles is 10 or 12 mm. For cutting, circular saws are used. In general, the slabs are sold as it is but in case of tiles, they are polished using various pneumatically-operated or other polishing machines, such as, line polishers, trimmed and cut to size, buffed and chamfered using different types of machines before being sold.

Rajasthan has about 95% processing capacity in the country. There are a number of gang saws and many automatic tiling plants that are in operation. Important processing centres in the State are Makrana, Jaipur, Alwar, Ajmer, Udaipur, Nathdwara, Rajsamand, Abu Road and Kishangarh. The capacity for marble slab production in the state is around 1,000 million sq ft per annum and for polished tiles, it is 3,000 million sq ft. In Gujarat, there are about 22 processing units located at Ahmedabad, Ambaji and Vadodara. India has a rich tradition of processing stones and carving jalis, pillars, garden furniture, floral and other design by expert craftsmen. The craftsmen have developed their art using manual means and simple tools. Presently, art collectors from world over seem to demand hand-carved articles produced especially in Makrana. Congruent with this trend, Stone Fairs are regularly organised in Rajasthan to promote stone artifacts produced and to provide the necessary impetus to sculptors and craftsmen.

CLASSIFICATION

A variety of marbles are produced and marketed under various trade names on the basis of colour, shade and pattern. These are i) Plain

White Marble, ii) Panther Marble, iii) White-Veined Marble, iv) Plain Black Marble, v) Black Zebra Marble, vi) Green Marble, vii) Pink Adanga Marble, viii) Pink Marble, ix) Grey Marble and x) Brown Marble.

In addition, many new varieties of marble have been brought into the folds of classification especially after opening of new mining areas. The important new types other than the ones classified by BIS are given below:

1. Yellow marble from Jaisalmer.
2. Pista marble (amphibolite variety) from Andhi-Jhiri belt, Jaipur, Alwar and Dausa districts, Rajasthan.
3. Brown green and golden ultramafics from Dunkar, Churu district, Rajasthan.
4. Chocolate-brown and English teak wood marble from Jodhpur district, Rajasthan.
5. Parrot green marble from Jhilo in Sikar district, Rajasthan.
6. Chocolate-brown or wood-finish marble from Mandaldeh, Chittorgarh district, Rajasthan.
7. Purple marble from Tripura Sundari in Banswara district, Rajasthan.
8. Blue marble from Desuri in Pali district, Rajasthan.

The marbles have also been classified by their genesis and chemical composition as under:

i) Calcite Marble: It is a crystalline variety of limestone containing not more than 5% magnesium carbonate. Colour and designwise, it may vary from grey to white to any colour, and even figurative light- brown to pink.

ii) Dolomitic Marble: It is a crystalline variety of limestone containing not less than 5% or more than 20% magnesium carbonate as dolomite molecules.

iii) Dolomite Marble: It is a crystalline variety of dolomite containing in excess of 20% magnesium carbonate as dolomite molecules. It has variegated colours and textures. As the whiteness increases, the lustre and translucency

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increases to an extent that it starts resembling with onyx. The main advantage of this marble is availability of exotic colours and patterns and its low maintenance cost. Marbles of Banswara in Rajasthan and Chhota Udaipur in Gujarat belong to this category.

iv) Siliceous Limestone: It is a limestone containing high silica with smooth appearance due to fine-grained texture. It is difficult to cut and polish this type of marble but once polished, it gives a pleasant look. It is available in several colours and designs. The pink marble of Babarmal and Indo-Italian variety from Alwar belongs to this category.

v) Limestone: Several varieties of limestone are being exploited and used as marble. The Oolitic limestone of UK, Black Marble of Bhainslana, Katra & Sirohi and Golden-yellow Marble of Jaisalmer belong to this category. This type requires frequent maintenance in the form of polishing as they are non-metamorphosed and hence are softer in nature.

vi) Serpentine or Green Marble: This marble is characterised mainly by the presence of a large amount of serpentine mineral. It has various shades of green varying from parrot-green to dark-green and is known for having varying degrees of veinlet intensities of other minerals, chiefly carbonate of calcium and magnesium. Most of the green marbles from Gogunda, Rikhabdeo, Kesariyaji and Dungarpur belong to this category. This marble is mostly used for panelling. The darker variety of this marble, which is so dark-green that it looks like black, has been termed as Verde Antique.

vii) Onyx: It is a dense crystalline form of lime carbonate deposited usually from cold water solutions. It is generally transparent to translucent and shows a characteristic variegated colour layering due to mode of deposition. Such type of marble is found in Kupwara district in Jammu and Kashmir. It is used for making decorative articles.

viii) Travertine Marbles: It is a variety of limestone regarded as a product of chemical precipitation from hot springs. The depositional

history has left exotic patterns, when this is cut into thin slabs and polished, it become translucent.

POLICY

The Central Government has notified Marble Development and Conservation Rules, 2002 (notified on 15.5.2002) for conservation, systematic development and scientific mining of marble with a purpose to provide a uniform framework that would be applicable throughout the country. The maximum period for which a lease may be granted shall not exceed thirty years and minimum period shall not be less than twenty years. Further, no lease is to be granted unless there is mining plan duly approved by the State Government or any person authorised in this behalf by that Government. Normally, the minimum area of the lease to be granted should not be less than 4 hectares and maximum area shall not exceed 50 hectares.

As per the Export-Import Policy, 2009-14, and the Foreign Trade Policy thereunder, the imports of crude or roughly-trimmed, marble & travertine blocks, slabs and ecaussine & calcareous monumental or building stone are restricted while imports of alabaster are freely allowed under heading No. 2515. On the other hand the import of items falls under ITC(HS) Code 68022110 to 68022190 are freely allowed. The Ministry of Commerce and Industry, Deptt. of Commerce, vide notification No.65 (RE-2010)/2009-14. S.O.1802(E), dated 4.8.2011 has amended in the Schedule I (Imports) of the ITC(HS) Classification of Export and Import items. After amendment the entry would read as "Import permitted freely provided CIF value is US\$60 and above per square metre".

Import of marble, classified under chapter 25 and 68 from Bhutan shall be subjected to a combined annual quota of 10 lakh sq.ft (5,882 tonnes). The quota came into effect from the date of this Notification (i.e.No.69 (RE - 2010)/2009-14 dated 1.9.2011 and shall operate on financial year basis. Monitoring and allocation of the quota shall be made by the Government of Bhutan. The annual quota for import of marble from Bhutan will be 5,882 tonnes as against 1,847 tonnes previously as per Directorate General of Foreign Trade.

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USES AND SPECIFICATIONS

Marble is used widely in buildings, monuments and sculptures. Its utility value lies in its beauty, strength and resistance to fire and erosion. Marble has its application in interior and exterior wall cladding, interior and exterior paving, fireplace facing and hearth, lavatory tops, residential and commercial counter tops, table tops, statues and novelty items. The other non-conventional uses of marble are in toothpaste, paint, whitening, agricultural lime, etc.

Different marble varieties are used basically as both interior and exterior vertical wall cladding and flooring. Their use as structural elements (masonry), statues, epitaphs, graves, etc. is quantitatively less with funeral art accounting for the largest percentage. In interior application such as for floors, marble is used in the form of 20 mm thick cut-to-size slabs. The slabs are also used for interior and outer facings, stairs, table tops, kitchen platforms, etc. The tiles in sizes ranging from 10 x 10 cm to 60 x 60 cm are used for floors, dadoes and for skirting in thickness ranging from 10 to 20 mm. The selected marble blocks free from cracks and other inclusions are used for making artifacts, such as carved figures, handrails and balustrade for staircases, jalis, fire places, flower vases and many other pieces of art.

Indian standards for marbles (blocks, slabs and tiles) IS:1130-1969 (reaffirmed in 2008) are summarised as under:

i) Classification: Marble shall be classified as white and coloured categories.

ii) General requirements: Marble shall be free from foreign inclusions and prominent cracks.

iii) Sizes: Marble blocks shall be supplied in lengths ranging from 30 to 250 cm, widths 30 to

100 cm and thicknesses 30 to 100 cm. The slabs shall be supplied in lengths ranging from 70 to 250 cm, widths 30 to 100 cm and thicknesses from 20 to 150 mm. The tiles shall be supplied preferably in sizes of 10 x 10 cm, 20 x 20 cm, 30 x 30 cm, 40 x 40 cm, 50 x 50 cm and 60 x 60 cm with thickness ranging from 18 to 24 mm in the same piece.

Other sizes as agreed upon by supplier and purchaser may also be supplied.

iv) Physical properties: The physical properties of blocks, slabs and tiles shall conform to the requirements, as given under:

Physical Properties of Marble

Sl. No.	Characteristic	Requirement	Method of Test
1)	Moisture absorption after 24 hours immersion in cold water	0.4% max. by weight	IS : 1124-1974
2)	Hardness	3 min.	Mohs' scale
3)	Specific gravity	2.5 min.	IS : 1122-1974

v) Workmanship: The edge of slabs and tiles shall be true. The finishes shall be sand and/or abrasive-finish, honed-finish or polished-finish.

ENVIRONMENT

The environmental degradation during mining of marble is akin to any opencast mining activities, i.e., degradation and removal of top soil, mined out pits disturbing local flora & fauna and water table of the area. In addition, the rejected blocks, unsized blocks and rubbles generated from mining of blocks and from overburden when dumped unsystematically pose serious hazards.

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Recently, utilisation of smaller blocks in tiling plant has created a new way for judicious utilisation of the mineral resource.

The processing waste of marble cutting plants comes out in the form of 'Marble Slurry'. This marble slurry is being dumped by the processing plants at the nearest site available or in the notified areas marked for dumping near the plants. When this slurry dries up, it leads to serious environmental pollution. The major environmental problems due to marble slurry are listed below:

- 1) The slurry when dumped on open land affects adversely the productivity of the land as it reduces the porosity and prevents ground water recharge.
- 2) Areas with dumped slurry cannot support vegetation.
- 3) After drying, the finer fraction of slurry becomes airborne and causes serious air pollution which is not only detrimental to human beings but also to vegetation and machinery.

The TIFAC (Technology Information Forecasting and Assessment Council) in collaboration with Regional Research Laboratories and Central Building Research Institute (CBRI), Roorkee, have found many uses of slurry by developing masonry cement, distempers, tiles, cellular concrete, gypsum plaster- based plane/fibre-reinforced boards and blocks.

WORLD REVIEW

Resources of natural stones are substantial in the world and almost every country produces dimension stones. Major exporting countries of marble in the world, are China, Italy, India, Spain, Turkey, Greece, Brazil and Portugal.

FOREIGN TRADE

Exports

Exports of marble (total) increased considerably to 372,368 tonnes in 2012-13 from 325,248 tonnes in the previous year. Out of total marble exported in 2012-13, exports of dressed marble was 261,940 tonnes, and exports of other marbles was 110,428 tonnes. Exports were mainly to China (28%), Egypt (13%) and Nepal (11%) (Tables - 4 to 6).

Imports

Imports of marble (total) increased considerably to 757,752 tonnes in 2012-13 from 635,962 tonnes in the previous year. Imports of dressed marble at 618,389 tonnes shared 82% imports in 2012-13 while the remaining 18% imports were of other marbles. Main suppliers of marble were Italy (46%), followed by Turkey (22%), China (8%), Oman (6%), and Egypt (4%) (Tables 7 to 9).

Table – 4 : Exports of Marble : Total (By Countries)

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	325241	3861834	372368	5430796
China	88546	760016	103339	1012017
USA	10626	436904	14468	682486
Egypt	51370	583257	49912	641070
Nepal	46141	309796	40745	443766
Italy	12908	180267	17118	232213
Saudi Arabia	7329	101579	10505	198098
UAE	10284	191155	10983	189752
Chinese Taipei/				
Taiwan	3108	28170	13581	175546
Hong Kong	20983	122506	22921	159794
Germany	2765	52058	5412	118872
Other countries	71181	1096126	83384	1577182

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**Table – 5 : Exports of Marble (Dressed)
(By Countries)**

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	241571	2426156	261940	3211886
China	85781	724034	99169	931667
Nepal	43382	298698	37883	414541
USA	5100	231948	5447	362742
Egypt	28667	256890	24813	231419
Chinese Taipei/ Taiwan	3016	25931	13121	159268
Italy	8804	97994	13405	148617
Hong Kong	20978	121551	21016	139255
UAE	4476	94704	3937	79209
Germany	2395	41156	3984	71490
Iraq	1130	13077	2035	62616
Other countries	37842	520173	37130	611062

**Table – 6 : Exports of Marble (Others)
(By Countries)**

Country	2011 -12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	83670	1435678	110428	2218910
Egypt	22703	326367	25099	409651
USA	5526	204956	9021	319743
Saudi Arabia	5697	74166	8532	151934
UAE	5808	96451	7046	110543
Italy	4104	82272	3713	83595
China	2765	35982	4170	80350
Russia	1882	49634	2172	66935
Pakistan	3354	40539	4257	60719
Turkey	2502	42097	3602	59976
Algeria	3544	43821	4083	59279
Other countries	25785	439393	38733	816185

**Table – 7 : Imports of Marble :(Total)
(By Countries)**

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	635962	14466429	757752	20312975
Italy	295055	5814271	345060	7539160
Turkey	121542	2125136	165334	3267821
China	51567	2094655	60326	3088534
Oman	30517	1064930	43120	2000608
Sri Lanka	12399	622756	17046	918371
Vietnam	38377	595781	27641	804271
Egypt	24461	484160	34018	692364
Spain	9218	219601	13236	325860
Greece	7649	331375	7551	269463
UAE	2846	57798	4976	151053
Other countries	42331	1055966	39444	1255470

**Table – 8 : Imports of Marble (Dressed)
(By Countries)**

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	532346	9762692	618389	12695212
Italy	272798	4767596	327112	6480837
Turkey	115441	1895149	161314	3081929
China	19359	637982	18547	643523
Egypt	21633	381111	30028	571286
Vietnam	37774	569263	21483	408393
Oman	13689	394337	9217	326663
Spain	7833	148528	12055	245497
Iran	4766	80162	5832	114180
Greece	3689	89556	4701	110922
Sri Lanka	2838	127220	2147	106991
Other countries	32526	671788	25953	604991

**Table – 9 : Imports of Marble (Others)
(By Countries)**

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	103616	4703737	139363	7617763
China	32208	1456674	41779	2445011
Oman	16828	670593	33903	1673945
Italy	22257	1046676	17948	1058322
Sri Lanka	9561	495536	14899	811380
Vietnam	603	26517	6158	395878
Turkey	6101	229988	4020	185892
Greece	3960	241818	2850	158540
Egypt	2828	103049	3990	121079
Portugal	641	39623	1425	100383
Spain	1385	71072	1181	80363
Other countries	7244	322191	11210	586970

FUTURE OUTLOOK

As per the Report of the Working Group for 12th Plan, Planning Commission of India, the demand for marble and other dimension stones, viz, granite, sandstone, etc. and stone products is anticipated to grow at around 15% CAGR. A similar rate of growth in exports can also be achieved with the help of suitable policy framework, infrastructure and other facilities which are expected to be provided to the industry. The Working Group has recommended that there is a strong need for well-planned, concerted and dedicated efforts towards export promotion of Indian stones. The emphasis needs to be on popularisation of Indian stones in both the traditional markets and exploration of new avenues by strengthening the activities of the Centre for Development of Stones (C-DOS) in Rajasthan by upgrading it into a national centre of excellence. Centre for Development of Stones (C-DOS), Rajasthan, a state government agency, has been recommended to be upgraded and re-designated as a National agency for technology/skill upgradation, market development support

etc. for marble. A separate national agency is required to be established in southern India for development of granite and other stones. The Working Group has stressed on the alternative option for exporting granite and marble in processed form to maximise export earnings to develop and promote artifacts and special decorative and ornamental items of high value addition. There is tremendous skill in the country, which can be explored and supported with special incentives. This can certainly bring about substantial foreign exchange addition, as well as significant employment generation.

The Working Group has observed that the present investment in dimensional stone industry in India is estimated at ₹ 20,000 crore. It is expected that, given the right policy support, the total turnover of the sector would be over ₹ 40,000 crore by 2012-13, and would double every five years considering an estimated growth rate of 15%. To sustain this growth, it is estimated that investment in this sector will have to go up to about ₹ 1,07,500 crore by 2022-23 (including foreign investment).

The Working Group has also made the following suggestions :

In order to promote the dimension stone industry by taking country as a whole there is a need to have a suitable rate of royalty in all the states.

Initiatives need to be taken in the form of fiscal measures as customs and excise duties to encourage import of dimension stones rather than finished products. This will encourage value addition and transfer of technology in the field of dimension stones in the country, which will contribute employment generation and foreign exchange earnings for GDP growth.

The dimensional stone sector should be given the status of industry so that it can qualify for the fiscal benefits, like financial incentives, low cost loans, etc.