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Granite technically refers to a light-coloured granulose plutonic rock composed of felspars, plagioclase, quartz (felsic minerals) and minor amounts of mafic minerals, such as biotite, hornblende, pyroxene, iron oxides, etc. But, in the commercial parlance, the term granite has become synonymous with all those crystalline rocks which have pleasing colours, strength to bear the processes of quarrying and cutting & polishing and are used commonly for decorative purposes. Being more resistant to wear and tear as well as weathering, granite is most sought-after stone to be used as building as well as decorative stone. The fascination for granite is due to its taking mirror-like polish, high compressive strength, longevity and beauty. India possesses enormous deposits of all types of dimension stones. It is one of the largest producers of dimension stones in the world. The dimension stone industry employs over one million workforce. This industry plays a vital role in the economy of states like Tamil Nadu, Andhra Pradesh, Karnataka and Rajasthan. Rural economy of many developing states like Madhya Pradesh, Uttar Pradesh, Orissa and North-Eastern States is dependent on this industry.

The granite used for decorative purposes is a costly material in comparison with other materials. Hence, its utilisation and trade within the country has been at a low profile compared with the exports. With the emergence of the rich middle class and spurt in construction activity, the internal trade is on the rise.

Although granite is a minor mineral, it is a major contributor in foreign exchange earnings. India is the second largest exporter of raw granite after China and ahead of Brazil and South Africa. India ranked fifth in the export of processed (value added finished) product. Granite contributed 4.51% exports value of all ores and minerals in 2007-08. The exports value of granite was next to diamond and iron ore during 2007-08.

RESOURCES

India is endowed with abundant resources of a wide variety of granite. As on 1.4.2005, resources of granite dimension stone of all types are estimated at 37,426 million cubic metres. Of these resources, 1,130 million cubic metres (about 3%) fall in reserves category while remaining 36,296 million cubic metres or about 97% fall in resources category.

Gradewise classification reveals that about 8% resources fall under black granite while 91% under coloured granite. About 1% reserves and resources are of unclassified grade.

Under reserve category, about 23 million cubic metres of all grades fall under proved category while 1,162 million cubic metres fall under probable category.

Statewise breakup of resources reveals that Karnataka with about 25% resources is leading followed by Jharkhand (24%), Rajasthan (23%), Andhra Pradesh (6%), Madhya Pradesh (5%) and Orissa (5%) which together accounted for 88% resources. With regards to reserves, about 93% reserves are located in Madhya Pradesh (86%) and Orissa (7%).

The details of reserves/resources as on 1.4.2005 are given in Table-1.

PRIME VARIETIES OF INDIAN GRANITE

In the world market, there are nearly 300 varieties of granite. India supplies more than 160 varieties. Out of these, prime varieties represent a wide spectrum of colour, texture and structure. These prime varieties have substantial resource base. Commercial names of granite are derived from area, colour, patterns, etc.

Karnataka specialises in the production of Ruby red, Kanakpura multicolour, Himalayan blue and Sira grey varieties of granite. Andhra Pradesh is famous for Black Galaxy, Srikakulam blue and black varieties of granite while Tamil Nadu is abundant in Jet-black and Tippu-white, Kashmir-white and Paradiso varieties of granite. Availability of varieties of granite in various states is given in Table- 2.

EXPLORATION & DEVELOPMENT

Keeping in view the increasing demand in both domestic and international markets for new varieties, DMG, Governments of Rajasthan, Karnataka and Nagaland were actively engaged in Exploration & Development activities. The details of work carried out by State Directorates are summarised in Table - 3.

**Table – 1 : Reserves/Resources of Granite (Dimension Stone) as on 1.4.2005
(By Grades/States)**

(Thousand cubic metres)

Grade/State	Reserves				Remaining resources				Total resources (A+B)			
	Proved STD111	Probable		Total (A)	Pre-feasibility		Measured STD331	Indicated STD332		Inferred STD333	Reconnaissance STD334	Total (B)
		STD121	STD122		STD221	STD222						
All India : Total	23010	1075059	31955	1130024	44220	513249	841284	2064405	32793579	39240	36295977	37426001
By Grades												
Black granite	2694	11489	1933	16116	37920	500099	50934	465940	2089501	-	3144393	3160510
Coloured granite	20316	1063570	30022	1113908	6300	13150	790351	1276665	30666984	39000	32792449	33906357
Unclassified	-	-	-	-	-	-	-	321800	37095	240	359135	359135
By States												
Andhra Pradesh	-	-	-	-	-	-	-	-	2405890	-	2405890	2405890
Assam	-	-	-	-	-	513000	-	800	70150	-	583950	583950
Bihar	-	-	-	-	-	-	-	179000	698612	-	877612	877612
Chhattisgarh	-	-	-	-	-	-	-	-	50057	-	50057	50057
Gujarat	-	-	-	-	-	-	-	-	421296	-	421296	421296
Haryana	-	-	-	-	-	-	-	-	34000	-	34000	34000
Jharkhand	-	-	-	-	-	-	-	651300	8196064	-	8847364	8847364
Karnataka	19212	16617	18983	54812	-	-	4198	1231625	7998043	19000	9252866	9307678
Kerala	140	-	-	140	-	99	-	-	2570	-	2669	2808
Madhya Pradesh	-	969224	-	969224	-	150	-	540	1024170	-	1024860	1994084
Maharashtra	-	-	-	-	6300	-	486925	-	665622	-	1158847	1158847
Meghalaya	-	-	-	-	-	-	-	-	286467	-	286467	286467
Orissa	-	80000	-	80000	-	-	330328	-	1432492	240	1763060	1843060
Rajasthan	-	-	4500	4500	-	-	-	-	8500708	20000	8520708	8525208
Tamil Nadu	-	9218	8472	17690	37920	-	7	-	503818	-	541745	559435
Uttar Pradesh	-	-	-	-	-	-	-	-	494819	-	494819	494819
West Bengal	3658	-	-	3658	-	-	19827	1140	8802	-	29768	33426

Figures rounded off

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Table - 2 : Varieties of Granite in Various States

State	Variety
Andhra Pradesh	Black Galaxy, Srikakulam blue, steel grey, Paradiso, Anantapur grey, Silver Galaxy, etc.
Bihar	Tiger skin, Mayurakshi blue, Sawan rose, English teak, black-cheeta, etc.
Gujarat	Sonabadi grey, Balaram pink, Ajapur Galaxy, Godhra grey, Maharaja tiger-black, etc.
Haryana	Steel-grey porphyry, purplish granite porphyry, deep pink
Karnataka	Ruby red, Fish Belly, Himalayan blue, Sira grey, Red multi, Tumkur porphyry, Hassan green, Magadi pink, Tiger black, etc.
Kerala	Tropical green, Paradiso, Kerala white, etc.
Maharashtra	Grey silk, Light pink, Jhansi red, etc.
Madhya Pradesh	Multicoloured, black granite, etc.
Orissa	Berhampur blue, Silver grey, Seaweed green, Chilka blue, Red pearl, Jeypur and Keonjhar black, etc.
Rajasthan	Mokalsar green, Nagina green, Rosy pink, Blue Pearl, Chima pink, Bala flower, platinum-white, etc.
Tamil Nadu	Kashmir white, Rawsilk, Paradiso, Pink multi, Colombo Juparana, Tiger skin, Kunnam black, Turaiyur blue, etc.
Uttar Pradesh	Ruby red, Jhansi red, grey granite, black granite, etc.
West Bengal	Bero pink porphyry, streaky gneiss, Purulia black, Birbhum pink, Spotty black, etc.

Table - 3 : Details of Exploration for Granite, 2006-07 and 2007-08

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage (m)		
2006-07							
DMG, Andhra Pradesh							
East Godavari	Chopparipalem, Jaderu, Nellipudi and Thungamadugulu	-	-	-	-	-	Reconnaissance survey carried out. Investigation is under progress.
Medak	Kukunur, Jukkal, Gadipeddapur, etc.	-	-	-	-	-	-do-
Visakhapatnam	Madigunta, Nalanki, etc.	-	-	-	-	-	-do-
DMG, Rajasthan							
Barmer	Duda Beri, Nand & Sheoki-Magri	1:50,000 1:10,000 1:2,000	120.00 18.00 1.50	-	-	5	Occurrence of pink coloured medium to coarse grained granite seam.
-do-	Nausar Kamthai, etc.	1:50,000 1:10,000 1:2,000	200 20 2	-	-	40	Syenite rocks suitable for decorative stones reported to occur at Goyana- Bhakar, Dandeli, etc.
Pali	Chaug, Rojra, Khidargaon, etc.	1:10,000	10.00	-	-	-	Deposits of blockable granite were located.
2007-08							
DMG, Karnataka							
Chikballapura Thimmasandra	Diburhalli,	1:50,000	500	-	-	8	Estimated about 0.64 million cu m reserves of granite to a workable depth of 20 m.
Hassan	Hosakote Uchangi etc.	1:50,000	600	-	-	5	Estimated about 0.35 million cu m resources of dolerite to a workable depth of 20 m.
DGM, Nagaland							
	Old- Avangkhu	1:4,000	2	-	-	-	Estimated about 8 million tonnes of resources of granite suitable for dimensional stone.
DG, Orissa							
Khurdha	Kaluchua Dhania, etc.	1:50,000 1:25,000	202 14	-	-	62	Work was in progress

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PRODUCTION

Granite, being a “Minor Mineral,” falls under the purview of the State Governments. Therefore, precise data on production of granite are not available. An attempt has been made to compile the data of granite production received from various States. The production of granite is given in Table-4.

Major production of granite in raw as well as processed form is generally from Tamil Nadu, Karnataka, Andhra Pradesh, Rajasthan, Gujarat, Uttar Pradesh and Orissa.

The important granite producing centres in Tamil Nadu are Dharmapuri, Erode, Madurai, Salem, Virudhunagar and Vilupuram districts. In Rajasthan, production centres are mainly spread in the districts of Jalore, Pali, Sirohi, Barmer, Ajmer, Jaisalmer, Jhunjhunu and Jodhpur. Karnataka is another important producer of granite varieties occurring in the districts of Bangalore, Mysore, Gulbarga, Hassan, Raichur and Kolar. However, production data are not available from this State. The occurrences of granite have been reported from three districts of Uttar Pradesh, namely Lalitpur, Mahoba and Banda. However, almost all the production comes from Lalitpur district. In Andhra Pradesh, important mining areas are located in the districts of Chittoor, Anantapur, Kurnool, Prakasam, Srikakulam, Warangal, Karimnagar and Khammam. Bihar, Kerala and West Bengal also produce granite.

Details regarding production of processed granite are not available. However, it is presumed that the processed material exported can be taken as production level in the country with addition of 5 to 15% for internal use. It may be mentioned here that the country is in a position to produce the required quantity of granite to meet demand of both domestic as well as export markets.

MINING

Production of blocks of considerable size and weight is a special feature of granite mining. The process and equipment used for granite mining differ considerably from those used for mining other minerals. The mining of granite involves two important stages of operation: one is actual block splitting either from sheet rock or boulder and the other operation involves many items of works, such as removal of weathered zone or overburden, opening of faces, lifting of cut blocks, transportation and many other ancillary work before and after the block splitting.

The actual block splitting from the sheet rocks or boulders is mainly done manually or in some cases by semi-mechanised methods whereas the other operations, such as removal of overburden, lifting and transportation of cut blocks, etc. are carried out by mechanised method. There are a very few mines which adopt the modern method of block splitting by using flame-jet burner and diamond wire saw for cutting. Heavy-duty derrick cranes of capacity to handle

**Table – 4 : Production of Granite, 2004-05 to 2006-07
(By States)**

		(Value in Rs.'000)					
State	Unit	2004-05		2005-06		2006-07 (p)	
		Quantity	Value	Quantity	Value	Quantity	Value
India	-	-	5441317	-	13415793	-	13915122
Andhra Pradesh	cu m	357708	4390935	805997	12477701	796880	13308421
Chhattisgarh	cu m	72	85	-	-	-	-
Gujarat	cu m	6408	1675	95613	9508	47169	8648
Jharkhand	cu m	3	414	-	-	NA	NA
Kerala	cu m	NA	NA	NA	NA	2319	NA
Rajasthan	tonne	207548	36988	264771	228414	335092	234053
Tamil Nadu	cu m	168341	260494	185743	320035	NA	NA
Uttar Pradesh	cu m	23876	417830	21722	380135	20800	364000

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50-tonne blocks from a depth of more than 60 m has brought revolution in granite quarrying by way of more output with less cost. The percentage recovery of granite is quite low, and it varies from 5 to 15% because of unscientific mining method.

Efforts are being made in adopting more modern and scientific mining methods to enhance the recovery of dimensional blocks. For this purpose, 'Water Jet Cutting', a new technique, is used. In this technique, water with tremendous pressure is passed through an orifice to form a jet. This jet is used to cut into the primary blocks as well as secondary blocks. The cutting loss in this process is minimum and there is no damage to adjacent block as in case of blasting.

PROCESSING INDUSTRY

The processing of granite in India is an age-old phenomenon and started in a small way in 1930s when some trimmed blocks as kerbstones were exported to UK. Since then, semi-hand-worked or hand-polished granite tomb stones found their acceptability in UK. Granite processing basically involves sawing or cutting of raw blocks into the tiles/slabs of required size & thickness and polishing of sawn-off surfaces. Other ancillary functions involve edge cutting, milling, boring and contouring for enhancing the quality and price of production. In India, the processing industry is in three sectors; namely, small-scale units, medium-scale units and 100% export-oriented units (EOU). The processing industry of granite in the country has been developed over the years. The share in exports of processed material has increased.

USES & SPECIFICATIONS

Uses

Granite is the most sought-after building stone since long. In the ancient times, the granite pillars and beams were preferred material to support the huge structures of temples and palaces and for making protective walls around them. With the invention of modern tools of greater hardness and polishing ability, the use of granite has rather increased for aesthetic values. The modern motorised tools of tungsten carbide and brazed diamond have enabled the user to cut & polish granite as per the specifications of the

building sector. Presently, cut and polished granite slabs of 20 mm thickness are preferred for flooring, while tiles of 10 or 12 mm thickness are used for cladding. In addition to this, gravestones and monuments of various shapes and sizes are also in vogue. Because of the flexibility of the cutting tools, many artifacts of granite for decorative purposes are being made.

Granite also finds its application in making garden furniture, such as benches, fountains and many other articles which are used for landscaping and/or decorative purposes. The cut-to-size small blocks are used as cobblestone, kerbstone, road sidings and many other innovative uses.

Crude granites are utilised for structural purpose after little dressing & sizing whereas processed granites are used mostly in the construction of buildings and monuments and for interiors and exterior facing. Because of its superior wear resistance and non-denting quality, granite is used for various meteorological and engineering instruments, such as surface plates, straight edges, parallels, cubes, V blocks and work-mounting tables of co-ordinate measuring machines.

The surface plates are used as flat datum surface whenever precise measurements of dimensions and geometrical relationships are to be carried out. For this purpose, the harder variety of granite is required so that it can bear the high-degree of grinding, polishing and calibration for achieving flat surface. It has been found that granite which is to be used for surface plates should have a close grain size, homogeneity, high density and hardness, uniform colour and low moisture absorption. The granite should be free from flaws.

Specifications

The properties of granite which are normally valued for exploitation are compressive strength, tensile strength, density, p-wave velocity, etc. For the marketability, other requirements like colour, texture, granularity, size, water absorption, porosity, hardness, moisture content, etc. are also essential. Raw blocks should be free from normal defects like fractures, joints, shears, hairline cracks, segregation, veins, etc.

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The snippets of BIS specifications for granite are given below:

IS: 3316 - 1974 (First Revision; Reaffirmed 2003) Specifications for Structural Granite

This standard covers section, grading and strength requirements of structural granite for various constructional uses. The general requirements as per the specifications are that granite shall be free from flaws, injurious veins, cavities and similar imperfections that would impair its structural integrity and would affect adversely its strength and appearance. The strength requirements as per IS: 3316-1974 are as follows:

- i) The compressive strength when tested according to IS: 1121-1974 (Part 1) shall be not less than 1,000 kg/cm²
- ii) The true specific gravity when tested according to IS:1122-1974 shall not be less than 2.6.
- iii) The water absorption when tested according to IS: 1124-1974 shall not be more than 0.50%.

The shape of slabs shall be rectangular or square and of specified dimensions with a tolerance in length and breadth shall be 12 mm and thickness 1 mm. The dimensions of blocks for masonry shall be as specified. The tolerance shall be allowed 15 mm for facing blocks.

IS:14223 (Part 1) - 1995; (Reaffirmed 2001) Specifications for Polished Building Stones: Pt I Granite

This standard covers physical properties and finish requirements of polished granites used for various purposes. The general requirements as

per the specifications are that the granite should be free from all imperfections and deleterious minerals that may interfere with the appearance, strength, structural integrity and its amenability to take good polish. Imperfections are mostly imparted by the textural variations which is a function of degree of uniformity and the distribution of the constituent minerals. Hairline cracks/joints, flower, moles, knots, white and dark lines due to segregation of light-coloured minerals in multicoloured granite and ferromagnesium minerals in light-coloured granites are considered to be the imperfections. Granite should be free from deleterious minerals, such as pyrite, marcasite, biotite, chlorite and ilmenite which interfere with the colour and appearance on weathering and also affect polishing characteristics.

The shapes of the slabs shall be rectangular or square and of specified dimensions with a tolerance in length and breadth shall be +2 mm and thickness +1 mm. The bottom face may be rough but the top surface shall be fine-polished and joint faces shall be dressed with the top surface without hollowness and spalling off.

The physical properties of granite shall conform to the requirements given in Table-5. Surface of the polished granite shall be mirror-finish without any hairline crack. The polish on the surface shall be checked with glassometer and shall not be less than 95%.

On the international scene, with the formulation of European Economy, the CEN Norm has come into force. As per CEN TC 246, various standards of stones have been formulated. The objectives of these standards are to oblige the companies to have the tests of the different stones being commercialised so as to allow the users the choice of the stone with physical characteristics according to its use. It is mandatory for every company doing business with European Union to mark their product with 'CE' marking from March 2004 onwards.

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Table – 5 : Physical Properties of Granite as per IS : 14223 (Part 1) -1995

Sl. No.	Characteristic	Requirements		Indian Standards
		Pink granite	Multicoloured & grey granites	
1	Moisture content (%) (max)	0.15	0.15	13030-1991
2	Dry density (m/v)	2.58 to 2.63	2.60 to 2.68	13030-1991
3	Apparent specific gravity (min)	2.75	2.75	1124-1974
4	Water absorption (%) (max)	0.50	0.50	1124-1974
5	Porosity (%)	1.02 to 2.50	1 to 2	1124-1974
6	Compressive strength (kg/cm ²)	1000-1500	1300-2200	1121 (Part 1)-1974
7	Tensile strength (kg/cm ²) (min)	90	90	1121 (Part 3)-1974
8	Shear strength (kg/cm ²)	280-425	300-540	1121 (Part 4)-1974
9	Hardness (Mohs' scale)	6 to 7	6 to 7	13630 (Part13)-1993
10	Hardness (Schmidt No.)	80-100	85-110	12608-1989
11	Hardness (Shore No.)	50-60	46 to 61	12608-1989
12	Ultrasonic pulse velocity	5000	5000	13311 (Part 1)-1992
13	Resistance to wear	Not greater than 2 mm, on an average and 2.5 mm for any individual specimen	Not greater than 2 mm, on an average and 2.5 mm for any individual specimen	1706-1972

POLICY

Granite is a 'Minor Mineral' under the MMDR Act, 1957. The grant of various mineral concessions for granite are therefore, administered under the Minor Mineral Concession Rules of the respective State Governments. However, the Granite Conservation and Development Rules, 1999 aims at uniform rules for conservation, systematic development and scientific exploitation of granite resources. GCDR, 1999 inter alia, provides for:

Prospecting licences (PL) prior to grant of mining lease; Period of PL; Minimum and maximum period of mining lease and for renewals; Minimum and maximum area of lease; Preparation of scheme of prospecting ; Mining Plan to be prepared for grant of mining lease; etc.

As per the export-import policy for 2004-09 and the Foreign Trade Policy as amended with effect from 1st April 2008, the imports of granite monumental and building stone falling under

heading No. 2516 (whether or not roughly/trimmed or cut into blocks or slabs) are restricted. On the other hand, worked granite blocks/tiles under sub-heading 680223 can be imported freely.

ENVIRONMENT

The mining of granite started initially in the bouldery zone had little damage to the environment. As more and more blocks in huge sizes were required to meet the demand, the sheet rock was approached by making cut in the ground and by removing top soil or overburden, which resulted in general degradation of environment.

Environmental problems are similar to any opencast mining operations. The general degradation of land due to unscientific and selective mining is a common feature. Because of paucity of suitable land in leased area, the overburden, consisting of soil and weathered material, is being dumped in a disorganised manner in nearby fields, waterways, etc., creating hindrance to cultivation and natural waterways; besides, air pollution

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causing breathing problems. Further, the blasting and movement of heavy vehicles generate dust and aggravates air pollution in addition to noise pollution.

The processing of granite requires huge quantities of water for cutting and polishing. In some cases, kerosene and lime water are used as coolants for cutting purpose. Although most of the kerosene and lime is recycled, there are always chances of mixing these coolants with natural water courses.

Sludge generated during cutting needs proper disposal to avoid increased silting and pollution of the natural waterways.

For abating environmental pollution, guidelines have been spelt out in GCDR, 1999. The technology for making artificial stone called Terrazzo will prove to be a boon for the utilisation of waste generated during mining and processing.

WORLD REVIEW

China

China has turned into a natural stone giant with rapid development, particularly in the last five years. There are four main regions for natural stone production and handling imports and exports: the provinces of Shandong, Fujian, Sichuan and Guangdong. The key centres of Chinese stone processing have been created mainly in Shandong, Fujian and Guangdong. Their chief function is to process local and imported materials into products for decorative interior finishing. Large quantities of natural stone are also imported for processing into gravestones for the Japanese and Korean market. About 50,000 companies currently operate in the stone sector in China.

Brazil

Brazil is indisputably a world power in today's natural stone sector. It is the largest producer in the world and well-known for producing prime varieties like Juparna, Classico and Tijuca black, from quarries located at the outskirts of Rio. Major areas of production are in Minas Gerais where multicoloured granite is produced. The yellow Veneziano variety of granite is produced in Victoria State.

The present trend of finished products clearly indicates high growth rates in the coming years. More than half the production is being exported. Brazilian exports of finished natural stone

products are heavily geared to the North American market. Around 80% of the total Brazilian exports of finished products go to the United States. In terms of weight, around half the Brazilian natural stone exports include rough blocks of granite.

Italy

The major players in the natural stone markets have changed dramatically in a short space of time. Italy as main producer and Germany as main customer have been replaced by China and the USA, respectively. Italy has a broad, in-depth know-how of stone quarrying and processing based on centuries of experience, but in the mass production segment, it has been overtaken by China, India and Iran. Other countries like Brazil and Turkey have also made big strides and are in a position to pose a challenge to Italy.

USA

The natural stone market in USA has grown strongly in the past years. The USA has gradually become second most important consumer of natural stone after China, in the world, in absolute figures.

The local production of natural stone has increased strongly in the USA. As a result of increasing imports of blocks, the quantity processed in the USA itself has also risen markedly. Around 30 % of present natural stone finished goods in the USA are created in its own production plants.

Russia

The demand for natural stone in Russia is growing noticeably due to the dynamic building industry. The import share in Russia is large, especially for processed stones, as marble and granite are increasingly purchased abroad for prestige reasons. The potential is considerable. The biggest demand for natural stones at present is mainly in the cities of Moscow, St. Petersburg and Krasnodar. Expectations are high from private customers to provide the strongest stimulation for demand in the near future.

Portugal

Natural stone is available in appreciable quantities in Portugal. About 1,000 companies produce approximately 2.6 million tonnes of rough blocks from over 500 quarries. Over 40% of Portuguese natural stone

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production was exported; mainly to Spain, France, England, Italy, Norway, Switzerland, USA, Japan and Saudi Arabia. Portugal is number six in the world ranking of countries producing natural stone. However, exports have been dropping for past two years.

Norway

The extraction of natural stone (mainly Labrador) in Norway reached new records. The production of rough stone has risen continuously since the start of the nineties. The largest part of the production is exported in the form of raw materials. The key customers are Italy and – to a heavily increasing extent – China. On the other hand, imports of natural stone finished goods have more than doubled within a decade.

Sweden

Sweden has extracted between 300,000 and 400,000 tonnes natural stone a year in the past ten years – with a slightly rising tendency. A large part of this stone is exported in the form of rough blocks and rough slabs. Swedish domestic consumption of natural stone reached its highest level of 170,000 tonnes in 2000 and has continuously declined since then.

FOREIGN TRADE

Exports

Granite is an important commodity amongst ores and minerals which is being exported from the country. It is mainly traded in the form of crude or roughly trimmed blocks; as cut blocks and slabs; and as polished blocks and tiles. The export value of granite (total) decreased to Rs. 4,287 crore in 2007-08 from Rs. 4,725 crore in 2006-07 and contributed about 4.5% of all-India exports of minerals & ores, next only to diamond and iron ore exports. The share of crude or roughly trimmed blocks was about 35% at Rs. 1,479 crore followed by granite (polished blocks/tiles) 31% at Rs. 1,333 crore, granite (others) 29% at Rs. 1,252 crore and granite (cut blocks/slabs) 5% at Rs. 223 crore. USA was the most important buyer for granite and its share in the total value of export was 24%, followed by China (19%) and Italy (8%) (Tables - 6 to 10).

Imports

In 2007-08, imports of granite (total) decreased to 37,621 tonnes from 41,301 tonnes in the previous

year. Out of the total imports, 20,383 tonnes were of crude and roughly trimmed granite, 3,439 tonnes of cut blocks/slabs, 7,229 tonnes of polished blocks/tiles and 6,570 tonnes of other granite. Granite was mostly imported from Saudi Arabia (29%) and Norway (28%) (Tables - 11 to 15).

**Table – 6 : Exports of Granite : Total
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	3291823	47248406	3701361	42874852
USA	378731	11881091	485970	10148566
China	1078133	9340089	405191	8036215
Italy	477432	4516046	409778	3416049
UK	82821	1993593	85283	2017695
Germany	65728	1897596	67514	1826119
U A E	82668	1717080	90836	1656013
Belgium	123251	1570497	120234	1624735
Hong Kong	177731	1561622	245045	1454193
Chinese Taipei/ Taiwan	186562	1335636	188717	1390583
Spain	130402	1547829	99555	1152229
Other countries	508364	9887327	503238	10152455

**Table – 7 : Exports of Granite
(Crude or Roughly Trimmed)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	2147415	17033727	2563921	14794490
China	1006519	8491255	1293036	6690762
Italy	322633	2705465	383851	2862963
Hong Kong	164342	1400541	237955	1344420
Chinese Taipei/ Taiwan	175665	1231045	171464	1209539
Spain	68303	516617	82074	720440
Belgium	92499	498117	86922	522232
USA	87065	202583	143133	400825
Thailand	13711	106647	17379	148190
Norway	22358	129711	25248	132895
Chile	101793	1155695	-	-
Other countries	92527	596051	122859	762224

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**Table – 8 : Exports of Granite (Cut Blocks/Slabs)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	294407	2317061	336619	2230540
China	31408	234490	79579	532091
USA	1742	13495	85805	352543
UK	33051	268022	34474	249229
UAE	7877	76088	12177	120544
Chinese Taipei/ Taiwan	6322	42040	14392	109843
Germany	7474	38835	11950	78495
Italy	124171	1037461	10286	76392
Nepal	10846	53009	10698	60247
Spain	27809	239397	6074	56904
Hong Kong	5943	54323	4808	48715
Other countries	37764	259901	66376	545537

**Table – 10 : Exports of Granite
(Polished Blocks/Tiles)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	552414	17919800	413816	13325620
USA	181644	7234181	130196	4781917
Germany	27585	1116627	24181	967378
China	33525	527065	29978	757718
Belgium	21083	750151	19902	694483
UK	20734	927199	16130	685242
U A E	48675	1126948	30232	646725
Netherlands	19953	724133	13550	537736
Canada	13922	584239	12701	505271
Italy	23821	632244	12450	352149
Spain	21108	524762	6445	206427
Other countries	140364	3772251	118051	3190574

**Table – 9 : Exports of Granite (Others)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	297587	9977818	387005	12524202
USA	108280	4430832	126836	4613281
UK	17761	734907	23968	1030028
UAE	22848	494209	37251	785949
Germany	18949	699216	19130	731262
Turkey	11025	246926	30984	694562
Canada	7551	315496	10802	418732
Belgium	7651	308285	9269	379079
Netherlands	8809	322246	9125	344124
France	4768	227434	5885	277491
Spain	13182	267053	4962	168458
Other countries	76763	1931214	108793	3081236

**Table – 11 : Imports of Granite : Total
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	41301	843620	37621	599360
Norway	11984	301937	10359	195707
Saudi Arabia	16775	294869	11060	135693
China	1192	20588	3393	57028
Finland	2710	49701	3099	48353
South Africa	1541	27620	2645	46205
Ukraine	29	3245	1010	20835
Brazil	1414	20739	1611	18280
Italy	2070	44228	590	13570
Iran	531	7282	573	8392
USA	303	15046	298	7984
Other countries	2752	58365	2983	47313

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**Table – 12 : Imports of Granite
(Crude or Roughly Trimmed)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	18494	302412	20383	287386
Saudi Arabia	9617	135354	8377	91890
Norway	4814	116009	3235	71820
South Africa	676	10366	1879	32773
Finland	1334	17355	2227	32668
Ukraine	-	-	756	13096
Brazil	985	8686	1294	11901
UAE	-	-	526	11306
Iran	521	6956	573	8392
Sweden	58	1789	315	6671
Switzerland	154	2313	155	2493
Other countries	335	3584	1046	4376

**Table – 14 : Imports of Granite
(Polished Blocks/Tiles)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	14564	389753	7229	148290
Norway	5162	152453	3926	76036
Saudi Arabia	6755	153384	1659	29666
Ukraine	29	3245	190	6717
South Africa	637	11596	362	6390
Finland	697	23029	57	5945
USA	172	10139	163	4446
China	12	1004	78	3583
Italy	228	6796	94	3032
Brazil	429	12053	236	2838
Indonesia	113	6099	-	-
Other countries	330	9955	464	9637

**Table – 13 : Imports of Granite
(Cut Blocks/Slabs)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	2401	34299	3439	47961
Norway	244	6388	2389	30723
Finland	-	-	600	7059
South Africa	136	1788	212	4075
Saudi Arabia	42	433	104	3116
Belgium	-	-	22	1261
Ukraine	-	-	64	1022
Italy	545	6704	2	90
Hong Kong	909	10291	-	-
Spain	359	5568	-	-
Vietnam	70	2292	-	-
Other countries	96	835	46	615

**Table – 15 : Imports of Granite (Others)
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	5842	117156	6570	115723
China	866	16864	3315	53445
Norway	1764	27087	809	17128
Saudi Arabia	361	5698	920	11021
Italy	1276	30430	494	10448
Thailand	-	-	80	3906
Brazil	-	-	81	3541
South Africa	92	3870	192	2967
Finland	679	9317	215	2681
USA	110	4606	85	2639
Canada	276	6546	-	-
Other countries	418	12738	379	7947

GRANITE

FUTURE OUTLOOK

The granite resources in the country are very large which can last for hundreds of years to meet demand - both domestic and export. The Indian granites can match the best granites produced in the world in terms of quality. The Indian granite is well established in the world market and it brings considerable amount of foreign exchange to the country.

The mining and processing techniques of granite adopted in the country have improved but need further improvement/upgradation so as to

enable the Indian granite to compete in the international markets, especially with countries like China, South Africa, Italy, Brazil and Canada. The Granite Conservation and Development Rules, 1999 are expected to bring uniformity and stability in quarry leases for granite and facilitate scientific mining which will ultimately help in proper planning, utilisation and management of granite resources in the country.

As per the XI Plan document it is estimated that domestic industry shall grow at the rate of 20% per year during the XI Plan period.