

72 Slate, Sandstone & Other Dimension Stones

The principal rock types used as dimension stones other than granite and marble are slate, sandstone, limestone and quartzite. India is endowed with abundant resources of these types of dimension stones which are increasingly used domestically. These stones are also important export commodities. India is one of the largest producers of dimensional stones in the world.

1. Slate

Slate is a low-cost decorative stone used for exterior and interior decoration of buildings. It is one of the important materials used for roofing. Slate is a fine-grained, very low-to-low metamorphic rock possessing a well developed fissility (splitting attitude) parallel to the planes of slaty cleavage. It has been formed by the metamorphism of pre-existing clay rocks such as claystone, shale or siltstone. The most remarkable feature of this rock is that it has very marked cleavage planes which enable it to be split manually or mechanically into relatively thin slabs. Slate is used as school slate and also as building dimension stone. Slate has the aesthetic value like other dimension stones, granite and marble. Slate has emerged as a low cost alternative to granite and marble which are comparatively costly. The exports of slate have increased over the years resulting in a boost to slate mining industry in the country. Micaceous and chlorite slates are generally preferred.

OCCURRENCES

The Aravalli Mountain ranges in Rajasthan and Haryana; rock assemblages under Cuddapah System in Andhra Pradesh and Tamil Nadu; and Himalayan

region in Northern India have undergone metamorphism and given rise to the slate deposits along with other metamorphosed products. The availability of slates has been reported from Madhya Pradesh, Haryana, Himachal Pradesh, Jharkhand, Andhra Pradesh, Rajasthan, Uttarakhand, Bihar and Gujarat.

Owing to the increased trade of slate, need for proper reserve estimation for slate is being felt now. However, the Centre for Development of Stones (CDOS), Jaipur, has placed the total all-India reserves of slate at around 500 million tonnes. It is reported that slate for commercial exploitation is located in Kumaon and Garhwal region of Uttarakhand; Mandi, Kangra and Chamba Hills of Himachal Pradesh; Kurnool, Nellore, Guntur and Prakasam districts of Andhra Pradesh; Rewari, Gurgaon and Mohindergarh districts in Haryana; Alwar, Bharatpur, Bhilwara, Bundi, Dausa and Tonk districts of Rajasthan.

PRODUCTION, STOCKS & PRICES

There was no production of slate during the year 2009-10 due to work stoppage and no reporting mine in 2009-10. The production in the previous year was 8,931 tonnes and there were two reporting mines in 2008-09. (Tables-1 & 2).

The mine-head stocks of slate at the end of the year 2009-10 were 2,408 tonnes as against 9,498 tonnes at the beginning of the year (Table-3). There was no employment of labour strength during 2009-10 as against 16 in the preceding year.

Value of production of slate (as dimension stones) decreased to Rs.301.7 lakh in 2008-09 from Rs.370.1 lakh in the previous year as per the data available (Table-4).

Table – 1: Production of Slate, 2007-08 to 2009-10 (By States)

(Qty in tonnes; value in Rs.'000)

State	2007-08		2008-09		2009-10 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	7827	2556	8931	5552	–	–
Andhra Pradesh	232	483	11	22	–	–
Madhya Pradesh	7595	2073	8920	5530	–	–

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**Table – 2 : Production of Slate, 2008-09 & 2009-10
(By Sector/States/Districts)**

(Qty in tonnes; value in Rs.'000)

State/District	2008-09			2009-10(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	2	8931	5552	–	–	–
Private sector	2	8931	5552	–	–	–
Andhra Pradesh	1	11	22	–	–	–
Prakasam	1	11	22	–	–	–
Madhya Pradesh	1	8920	5530	–	–	–
Mandsaur	1	8920	5530	–	–	–

**Table – 3 : Mine-head Stocks of Slate, 2009-10 (P)
(By States)**

(In tonnes)

State	At the beginning of the year	At the end of the year
India	9498	2408
Andhra Pradesh	578	–
Madhya Pradesh	8920	2408

**Table – 4 : Production of Slate - Dimension Stone, 2006-07 to 2008-09
(By States)**

(Qty in tonnes; value in Rs.'000)

State	2006-07		2007-08		2008-09	
	Quantity	Value	Quantity	Value	Quantity	Value
India	95102	36755	92835	37012	64286	30166
Andhra Pradesh	83556	24467	83270	26821	55400	19629
Himachal Pradesh	8230	11522	6762	9467	7417	10198
Jammu & Kashmir	100	9	110	10	110	10
Rajasthan	3216	757	2693	714	1359	329

MINING AND PROCESSING

Mining of slate is done by opencast method. The slate bands are exposed by removing the overburden by means of drilling and controlled blasting. The mining in many places is carried out by manual means but in some mines, semi-mechanised method of mining is also adopted. After removing a thick slab of slate, preferably of larger size, the slab is split using hammers and specially-made chisels and cutting knives. The saleable tile or slab of slate is obtained in 6 to 10 mm thickness for cladding and 20 to 35 mm

thickness for flooring or for panels. The edges are cut manually by using machines to have a smooth and regular edge. The slate as building stone is marketed under the commercial names, such as Golden Copper, Green, Black, Panther, Mica, Speckled, Deoli, Mahi, Silver Grey and Peacock. Peacock is the only premier variety produced in Kund area, Haryana.

The overall recovery of slate is very low, being a fragile material among all the building/dimension stones. Normally, huge accumulation of broken pieces in and around the slate quarry

is observed incidental to mining & processing. Proper mining and processing techniques by using modern equipment may improve the situation in future.

USES AND SPECIFICATIONS

There are two main uses or applications of slate as a natural stone in building work: 1) for roofing in the form of roofing tiles, and 2) for flooring in the form of tiles and for cladding purposes.

For roofing tiles, the slate should be exfoliated easily and it should be free from minerals like iron sulphides or carbonates which in time could cause corrosion and staining on roofing tiles. For cladding or flooring purposes, the slate should be able to bear the cutting processes in required sizes, polishing or smoothening process by machines and should not peel off during the process of fixing or laying. Bureau of Indian Standard has laid down Standard IS : 6250-1981 (First revision; reaffirmed 2003) namely, Specification for roofing slate tiles (First revision) in respect of requirement of dimensions, physical properties and workmanship of slate tiles used for sloped roof covering.

2. SANDSTONE

Sandstone is sedimentary rock largely made up of sand grains in size ranging from 2 mm to 120 mm of varying compositions. The sand may consist of grains of quartz, felspar and other detrital minerals with interstitial cementing material. The composition of sand particles and the cementing material, by and large, defines the colour of sandstone while the mode of formation decides the thickness of bed which gives rise to various types of sandstones.

The colour of sandstone may range from dark red to brown, earthy to buff, white, yellow and a number of other shades. The pattern of the sandstone depends upon the thickness of bed. Sandstone produced in the country is being marketed as Vindhyan Red, Rainbow, Teak, Modak, Bundi, Bansi Pink, Mandana, Dholpur Cream, etc.

The sandstone may occur as massive, thick, non-splittable bands or thin beds or layers that can be split by applying slight pressure.

RESOURCES

The occurrences of sandstone in India are spread over Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Madhya Pradesh, Meghalaya, Mizoram, Karnataka, Odisha, Punjab, Rajasthan, Uttar Pradesh, Tamil Nadu and West Bengal.

The resource estimation has not been considered important because of its abundance and easy availability. Hence, there is no comprehensive inventory of sandstone. However, the Centre for Development of Stones (CDOS), a Government of Rajasthan undertaking has reported estimated reserves of sandstone at over 1,000 million tonnes in the country. Huge deposits of sandstone in Rajasthan are associated with Vindhyan and Trans-Aravalli Formations, exposed over an area of nearly 35,000 sq km covering districts of Dholpur, Bharatpur, Karauli, Sawai Madhopur, Tonk, Bundi, Jhalawar, Kota, Bhilwara and Chittorgarh. It is also found scattered in the districts of western desert plane. Splittable sandstone deposits are confined to an area of 16,000 sq km out of which 10,000 sq km lies in eastern and south-eastern Rajasthan and 6,000 sq km in western Rajasthan.

In Gujarat, fine to medium-grained sandstone of varying colours ranging from white, light-purplish, reddish-brown, cream to yellow are found in the district of Kachchh. A brownish-yellow sandstone occurs near Chabari and Mainapara in Bhachau tehsil. The sandstone at Rampur, Katada-Roha and Rajoda Dungar near Mangwana in Nakhtrana tehsil is cream coloured and is fairly hard. Extensive deposits are found around Songir, Naswadi, Ghautoli, Namaria and Lachharas in Vadodara district.

The Vindhyan and Satpura Mountains in Madhya Pradesh have vast resources of sandstone. The red, cream and white sandstone are being quarried extensively in Panna and Shivpuri districts and in many areas near Jabalpur.

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In Uttar Pradesh, sandstones suitable for making slabs and tiles are located in Agra, Mirzapur, Lalitpur, Allahabad and Sonbhadra districts. The sandstone of Lalitpur district is yellow, light green and maroon and takes good polish. The sandstone in Lalitpur occurs in Madanpur and Rampura (near Deogarh) areas and is traded under the commercial name Royal Gold, Beach Sand and U.P. Green. The sandstone of Agra occurring in Tatpur area is red and mottled and is used for interior as well as exterior flooring and cladding. In Mirzapur and Sonbhadra areas, good quality buff to pale and creamish sandstone is available.

The felspathic sandstone occurring with the coal seams as overburden is also used as building stone. The Kamthi Sandstone occurring in and around tehsil Saoner, district Nagpur in Maharashtra, is being quarried in huge quantities and is used as building stone.

EXPLORATION & DEVELOPMENT

The DMG, Rajasthan, has carried out exploration for sandstone. The details of exploration are given in Table -5.

Table – 5 : Details of Exploration Activities conducted for Sandstone, 2009-10

Agency/State/ District	Location/ Area	Mapping		Drilling		Sampling (No.)	Remarks/ Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
DMG							
Rajasthan							
Alwar	N/v Hazipur, Khor, Nagali, etc.	1:50,000 1:10,000 1:4,000	100.0 10.0 2.0	–	–	20	Resources yet to be estimated
Bundi	N/v Prempura, Loicha, Dulhapura, Chand ka Talav, etc.	1:50,000 1:10,000 1:3,072	100.0 10.0 1.0	–	–	10	About 180 million tonnes resources of sandstone suitable for masonry purpose were estimated.
Dhaulpur	N/v Subhanpura, Raitoni, Amanpura, Hirapur, etc.	1:50,000 1:10,000 1:3,600	100 12.5 2.5	–	–	21	About 25.64 million tonnes resources of sandstone (blockable and splittable) were estimated.
-do-	N/v Chandpur Tal, Bhilgawa Tal, Khanpura, etc.	1:50,000 1:10,000 1:3,600	170.0 10.0 2.0	–	–	15	About 21.60 million tonnes resources of sandstone were estimated.
Jodhpur	N/v Mindoli Lavera Khurd, Melana	1:50,000 1:10,000 1:2,000	150.0 20.0 2.0	72.4	–	–	Location of buff coloured sandstone suitable for building stone was noticed in 1 sq km area near Mindoli. 1 to 1.50 m thick massive buff coloured sandstone was also noticed.
Karauli	N/v Kalyani	1:50,000 1:10,000 1:2,000	105.0 10.0 1.0	–	–	10	Not calculated as the areas were under leasehold.
Kota	N/v Bilonth, Mandliya, Mandana, Ramgarh, etc.	1:50,000 1:10,000 1:4,000	125.0 2.0 1.20	–	–	06	About 123.50 million tonnes resources of sandstone suitable for masonry purpose were estimated.

PRODUCTION

Data on production of sandstone are not available. However, Rajasthan may be producing about 90% of sandstone in the country used for building purposes and as road metal along with quartzite. Production value of quartzite and sandstone as available is given in Table-6.

Table – 6 : Production Value of Quartzite & Sandstone,* 2006-07 to 2008-09 (By States)

(In Rs.'000)			
State	2006-07	2007-08	2008-09(P)
India	5212254	5890393	8224119
Andaman & Nicobar	13295	32855	32855
Arunachal Pradesh	70	70	70
Bihar	114326	408358	408358
Chhattisgarh	277083	785122	825101
Himachal Pradesh	3235	–	–
Jharkhand	179761	179761	179761
Madhya Pradesh	224894	290378	345495
Maharashtra	500	500	500
Nagaland	1193	1193	1193
Odisha	230	230	230
Rajasthan	4397667	4191926	6430556

Source: State Governments

* Used for purposes of building or for making road metal and household utensils.

The intensive quarrying activities in Rajasthan are in the districts of Bharatpur, Sawai Madhopur, Karauli, Tonk, Bundi, Jhalawar, Kota, Bhilwara, Chittorgarh, Jodhpur, Nagaur and Bikaner. The red and blue Lower Bhandar Sandstones which are exposed over a large area of about 5,000 sq km in south-eastern Rajasthan, covering Kota, Bundi, Bhilwara, Chittorgarh districts is quarried at a number of places, important ones being Bijolia, Barisal, Navanagar, Banio-ka-Talab in Bhilwara district and Dabi, Budhpura, Umarthan in Bundi district.

The splittable sandstone areas are Bhanpura, Rajpura, Kasara, Chobe-ki-Guwari, Mokanpura, Berda and Bhakri in Karauli district. Other important areas of sandstone quarrying in Dholpur, Bharatpur and Sawai Madhopur districts are Sar Mathura, Bari Baseri, Hindon, Sapatra, Masalpur, Roopwas and Band-Barolla. In other districts, important places are Fidusar, Sursagar, Mandor and Balesar (Jodhpur district) and Chhoti and Badi Khatau (Nagaur district).

MINING & PROCESSING

Mining of sandstone is generally done manually by using hammers and chisels of various shapes. At the first stage, the overburden is removed which is in the form of soil, rubble or non-splittable sandstone. The hard non-splittable sandstone is drilled and blasted to expose the underlying splittable sandstone. But, with the advent of sandstone cutting and polishing machines, this operation is also executed carefully to obtain Khandas and blocks for further processing in the form of slabs.

In conventional mining, advantage of the natural vertical joints present in the range from 0.6 m to 60 m, is taken. The initial quarrying starts from these joints. After making the initial cut, blocks having 1.2 m width, 3 to 4 m length and thickness up to the nearest cleavage plane are removed.

In absence of joints, a 'jhiri' is opened in a line by drilling closely spaced (about 15 cm apart) oblong or eye-shaped holes (duggis) of about 8 to 10 cm depth and the eye-shaped steel wedges (Gullas) are hammered in these holes by expert miners. The continuous hammering develops a crack along the holes. The mining starts from these blocks. The required length and width of the slab to be obtained is marked and cut accordingly using the same technique of wedging. The splitting of individual slab is carried out using natural bedding plane by inserting sharp wedges or by hammering alone.

The majority of quarry owners produce hand-dressed slabs and tiles in different thicknesses. But, in the present export market, machine-cut tiles are in demand. Presently, the simple edge cutting machines with single or double cutters are used for getting machine-cut tiles. The further requirement of tiles in 10 to 12 mm thickness with one side natural and other calibrated has resulted in establishing cutting and polishing units of sandstone. In Rajasthan, there are four units engaged in the production of polished sandstone tiles measuring 30 x 30 x 1 cm and 40 x 40 x 1.2 cm. The sandstone is also exported with natural, honed and polish-finishes. BIS has prescribed IS:3622-1977 (First Revision, reaffirmed 2003) as the specifications for sandstone slabs and tiles.

3. Dimensional Limestone

The limestone which is used as a dimension stone differs from the limestone used for cement making or for any other industrial purpose in two ways: firstly chemical composition and secondly the mode of occurrence. In both the types, the major constituent is calcium carbonate but very high silica content gives limestone sufficient hardness to be utilised as dimension or building stone. The industrial limestone occurs as massive formation with less intercalations while in case of dimensional limestone, thin-bedded deposits are preferred. Limestone which is compact and amorphous in texture is known as flaggy or splittable limestone and is quarried in the form of thin slabs ranging in thickness from 12 mm to 50 mm in ready-to-use form.

Limestone has been used since ancient times for construction of houses, flooring and for various other building purposes. In recent times, the use of limestone has increased manifold mainly in interior flooring, cobble stones and for decorative purposes in combination with other stones because of its various colours and shades. Depending upon the place of origin of limestone and its colour, various types of nomenclatures have been used in the trade for

limestone, such as, Cuddapah Stone, Shahabad Stone, Kota Stone with different shades and colours (Kota Blue, Kota Brown, etc.), Kutch Stone, Miliolitic Limestone, etc.

OCCURRENCES

The occurrences of dimensional limestone have been reported from various states, such as, Shahabad Stone of Bijapur, Gulbarga and Belgaum districts in Karnataka; and 'Cuddapah Stone' of Kurnool, Anantpur and Guntur districts and 'Tandur Stone' of Cuddapah district, Andhra Pradesh, etc. Other coloured well-known limestones are from Betamacherla, Tadipatri, Macherla, Nereducherla and Muddimanikyam. 'Milliolitic Limestone' from Saurashtra region, 'Yellow Limestone' of Kachchh district of Gujarat, 'Kota Limestone' of Kota district and 'Yellow Limestone' of Jaisalmer district, Rajasthan are the other prime localities of dimensional limestone occurrences in India.

Rajasthan is endowed richly with the occurrence of greenish-grey 'Kota' limestone. The Kota stone has gained tremendous popularity and is widely used for flooring and cladding purposes. The important deposits of limestone are in Kota, Jhalawar, Chittorgarh and Jaisalmer districts, Rajasthan. Kota, Jhalawar, and Chittorgarh are the major producing districts of the dimensional limestone in the state. Extensive limestone deposits are found in the Upper Stage of the Lower Vindhyan, represented by limestone which has a good potential as cement-grade limestone as well as flooring stone. Certain portions of the limestone having splittable form are used extensively as flooring stones. The limestone occurs in a north-south belt from Dalla-ka-Khera to Nimbahera and extends into Madhya Pradesh, covering a distance of about 70 km. It is fine-grained, thinly bedded and has a total thickness of about 150 m. At a few places, the major portion of the limestone deposit is suitable for cement making but there are pockets containing splittable

forms that can be used for building and flooring purposes directly.

Yellow limestone deposits of Jaisalmer:

The yellow limestone of Jaisalmer is of Jurassic age and is found at Jaisalmer, Bada Bag, Mool Sagar and Kanod villages. It contains 42 to 51% calcium oxide and has thickness of about 3 m. It is quarried in the form of blocks and can be sawed into slabs and tiles. It is also termed as yellow marble as it takes reasonably good polish.

Flaggy limestone deposits of Jhalawar and Ramganjmandi, Kota area:

It belongs to Lower Vindhyan Group and is available in plenty at Sarola Kotri Chitawa and Khokhriya-Khurd. Extensive deposits are available near Ramganjmandi, Aroliya and Parolia areas. Ramganjmandi and Jhalawar Road are the main railway stations from where the splittable limestone produced is dispatched to various parts of the country. In the last few years, export market of this limestone which is popularly known as 'Kota Stone' has also been developed.

MINING AND PROCESSING

Although the mining methods as well as the processing of limestone have changed over the years but still there is scope for improvement in mining techniques. Simultaneously, the handling of waste and utilisation of waste rock is equally essential.

The mining of Kota Stone is carried out by opencast manual methods or by semi-mechanised methods. The Kota Stone is found in the form of natural thickness ranging from 12 to 150 mm or even more. The mined out slabs are cut to size by using hammer and chisel. Diamond saws are used to cut the tiles in required thicknesses and measurements. Tiles of Kota Stone are available in various sizes and thicknesses to suit the requirement of various building projects. Data on production of limestone is furnished in Table-7.

**Table – 7 : Production Value of Limestone*
2006-07 to 2008-09
(By States)**

(In Rs '000)			
State	2006-07	2007-08	2008-09(P)
India	3390764	7467549	7695154
Andhra Pradesh	20250	28225	22940
Chhattisgarh	308590	698339	1138863
Gujarat	146665	452899	452899
Jammu & Kashmir	58425	63099	63099
Karnataka	11	2802	13831
Madhya Pradesh	1750	6095	36094
Meghalaya	26784	26784	26784
Rajasthan	2828289	4738766	5493273
Uttarakhand	-	1450540	447371

Source: State Governments

** Used in kilns for manufacture of lime to be used as building material.*

This stone has a bright future and its demand can be increased manifold by adopting proper mining, processing and marketing techniques.

EXPLORATION & DEVELOPMENT

No exploration activities were reported for dimensional limestone during 2009-10.

USES & SPECIFICATIONS

Application of Kota Stone ranges from interior flooring, wall cladding to exterior use in paving and facades for building of all kinds and types.

The Kota Stone has a natural split non-slip surface. Massive, dense and fine-grained varieties are generally durable as these are not porous. These are tough and have a crushing strength of 17.8 kg/mm² and a high compressive strength of over 2189 kg/cm². Abrasion value of Kota Stone is 18.12 to 18.32 and has a high resistance to delamination and failure under freezing and thawing conditions.

Bureau of Indian Standards has adopted Specification for Limestone (Slab & Tiles) (First revision) as IS : 1128 - 1974 (First Revision, reaffirmed 2003).

4. Other Dimensional Stones

In addition to the dimension stones already described, other dimension stones are being quarried and used for the construction of houses and other building purposes.

In Odisha, Karnataka, Goa and in parts of coastal states, laterite is quarried in huge quantities. It is utilised as bricks in the construction of houses and pavements.

Huge deposits of basalt in Maharashtra, Karnataka and Gujarat are used as building stones since ancient times.

Quartzite bands occurring along with phyllite schists are also utilised for building purposes.

In addition, stone aggregates, such as broken and sized pieces of limestone, dolomite, quartzite and sandstone are mixed either with cement for building and road-making purposes or with asphalt for mending road. To utilise the huge waste generated during mining and processing, a new variety of man-made stone "Terrazo" has been developed, which is composed of stone chips set in cement, epoxy or polyacrylate and then polished. The Terrazo is an economical alternative to solid marble slabs or tiles.

5. Felsite

Felsite is a fine, evenly grained acid or intermediate igneous rock, usually occurring as dykes and veins in country rocks and in the parent plutonic mass. BIS has prescribed the specification IS:10874-1983 (reaffirmed 2000) for felsite grinding media and liner stones.

The production of felsite at 1,320 tonnes in 2009-10 increased by 7% as compared to that in

the previous year. There were 6 reporting mines in both the years. Four producers operating 6 mines accounted for the entire production of felsite during the year. All the mines are located in Mandya and Mysore districts of Karnataka (Tables - 8 to 10).

The mine-head stocks of felsite at the end of the year 2009-10 were 2,879 tonnes as against 2,638 tonnes at the beginning of the year (Table-11).

The average daily employment of labour was 39 in 2009-10 as against 38 in the previous year.

Table – 8 : Producers of Felsite, 2009-10

Name and address of producer	Location of mine	
	State	District
Smt. S. Rajee V. Raman 15/2, 8th Cross, 1st Main, V. V. Mohalla, Mysore – 570 002, Karnataka.	Karnataka	Mysore/ Mandya
Paramshiva Mining Enterprises No. 21/1, Chikka Adugodi, Tavarekere Main Road, Post Bangalore – 560 029, Karnataka.	Karnataka	Mysore
B .C. Muddumadappa, New Mysore Industries, 196, 23 rd Cross, 6 th Block, Jayanagar, Bangalore – 560 082, Karnataka.	Karnataka	Mysore
Brindavan Mining Enterprises Shri J. Madhu No. 165, K.R.S Road, Manti (Mogarahalli), S. R. Patna, Dist. Mandya, Karnataka.	Karnataka	Mandya

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**Table – 9 : Production of Felsite, 2007-08 to 2009-10
(By State)**

(Qty. in tonnes; value in Rs. '000)

State	2007-08		2008-09		2009-10 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	550	999	1238	1367	1320	1632
Karnataka	550	999	1238	1367	1320	1632

**Table – 10 : Production of Felsite, 2008-09 & 2009-10
(By Sector/State/Districts)**

(Qty in tonnes; value in Rs.'000)

State/District	2008-09			2009-10 (P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	6	1238	1367	6	1320	1632
Private sector	6	1238	1367	6	1320	1632
Karnataka	6	1238	1367	6	1320	1632
Mandya	2	286	215	2	492	687
Mysore	4	952	1152	4	828	945

**Table – 11 : Mine-head Stocks of Felsite, 2009-10 (P)
(By State)**

(In tonnes)

State	At the beginning of the year	At the end of the year
India	2638	2879
Karnataka	2638	2879

TRADE POLICY

As per the export-import policy announced for the period 2009-14; and the Foreign Trade Policy as amended, the imports of slate blocks or slabs whether or not roughly trimmed or merely cut are restricted under heading no. 2514. On the other hand, worked slate and articles thereof or of agglomerated slate can be imported freely under heading no. 6803.

Import of crude or roughly trimmed/cut blocks or slabs of sandstone and other monumental or building stones; viz, Pakur Stone, stone boulders, and others, are restricted under heading no. 2516.0 However, sets of curb stones and flagstones of natural stone (except slate) under heading no. 6801 and worked monumental

building stone (including slate) tiles, cubes and similar articles, under heading no. 6802 can be imported freely provided the c.i.f. value of items, under heading no. 6802 is US \$ 50 and above per sq m. Imports of items under Exim code 6802 from Sri Lanka under the India-Sri Lanka Free Trade Agreement (ISFTA) is allowed only through the port of Kolkata and is subject to all the conditions applicable under ISFTA.

WORLD REVIEW

Reserves of slate and other dimension stones are substantial in the world. Spain was the major exporting country for dimension stones in the world. Other important exporters of slate were China, Italy, India, Spain and Brazil.

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Major importers of slate were Germany, UK, USA and France.

exported followed by UK (12%) and Italy (9%) (Tables - 13 to 15) .

FOREIGN TRADE

Exports

Exports of building and monumental stones (NES) decreased to 1.05 million tonnes in 2009-10 from 1.29 million tonnes in 2008-09. Quantitywise, Maldives was the leading buyer sharing 36% in the total exports, followed by Bangladesh (29%) and UK (7%). Valuedwise, UK was the leading buyer, contributing 22% to total value of exports, followed by USA (12%) and Maldives (11%) (Table - 12).

In 2009-10, the total exports of slate decreased to 125 thousand tonnes from 154 thousand tonnes in 2008-09. Out of the total exports of slate during 2009-10, 38,114 tonnes was of slate (worked) while the bulk of the exports i.e. 87,349 tonnes was of slate (others). The USA was the leading buyer, accounting for over 42% value of the total slate

In 2009-10, the exports of sandstone decreased to 0.63 million tonnes from 0.75 million tonnes in the previous year. The UK was the leading buyer in 2009-10 with 51% of the total value of sandstone exported followed by Belgium with 6% (Table - 16) .

Imports

During 2009-10, imports of building & monumental stones (NES) decreased to 1.87 million tonnes from 3.07 million tonnes imported in the previous year. Nepal was the leading supplier contributing 48% to the total value of imports followed by Bangladesh (22%).

Imports of slate during 2009-10 were 146 tonnes compared to 13 tonnes in 2008-09. Imports of sandstone in 2009-10 were 21 thousand tonnes as against 52 tonnes in the preceding year (Tables - 17 to 19).

Table – 12 : Exports of Building and Monumental Stones, NES (By Countries)

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	1291492	3783042	1053238	2955553
UK	60196	551262	75823	640474
USA	24997	447861	44404	349428
Maldives	316146	319514	377152	318285
Belgium	30451	153384	29651	183389
Bangladesh	198535	90915	301617	153036
Italy	22316	225011	21635	151324
Germany	17693	130246	13672	142005
Saudi Arabia	369185	418338	50769	94972
UAE	11569	144642	9164	81016
Australia	15305	134158	4680	76044
Other countries	225099	1167711	124671	765580

Table – 13 : Exports of Slate (By Countries)

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	154017	2072052	125463	1980721
USA	62265	1011438	48009	825180
UK	12032	101953	18781	230241
Italy	2942	39269	7534	187570
Canada	13965	178373	7649	116011
Australia	10671	150896	6837	94918
Japan	698	8459	2854	67452
Spain	3929	47964	2920	38186
Netherlands	7210	66263	3176	37498
Belgium	4611	49518	2473	30725
South Africa	3847	46530	849	18043
Other countries	31847	371389	24381	334897

SLATE, SANDSTONE & OTHER DIMENSION STONES

**Table – 14 : Exports of Slate (Others)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	113950	1271298	87349	1089758
USA	37622	516370	27407	443146
UK	11095	83369	16728	132855
Canada	11729	131190	6681	97544
Australia	7709	93727	4722	51879
Italy	2222	25288	3364	35790
Netherlands	6411	52976	2720	29964
Spain	3013	32720	2179	26891
Belgium	3451	28864	2064	23129
Malaysia	4605	34141	3051	22498
South Africa	3595	40847	829	17296
Other countries	22498	231806	17604	208766

**Table – 15 : Exports of Slate (Worked)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	40067	800754	38114	890963
USA	24643	495068	20602	382034
Italy	720	13981	4170	151780
UK	937	18584	2053	97386
Japan	85	2230	2508	63520
Australia	2962	57169	2115	43039
UAE	236	5450	933	26439
Canada	2236	47183	968	18467
Mauritius	380	7665	393	14736
Spain	916	15244	741	11295
Belgium	1160	20654	409	7596
Other countries	5792	117526	3222	74671

**Table – 16 : Exports of Sandstone
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	748753	4358769	632406	4387790
UK	365837	1831742	345667	2248421
Belgium	57775	274828	52033	248004
Germany	27521	194911	27803	207287
Australia	14908	113593	14904	169727
Italy	44644	257202	19904	160553
UAE	25836	198797	19025	156433
Canada	15271	105668	19317	133946
Netherlands	21241	173364	15290	118700
France	26555	125850	20999	106572
Ireland	27384	178522	10125	84774
Other countries	121781	904292	87339	253373

SLATE, SANDSTONE & OTHER DIMENSION STONES

Table – 17 : Imports of Building and Monumental Stones, NES (By Countries)

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	3067772	1362230	1874801	1466316
Nepal	2762910	630604	1571616	709365
Bangladesh	292893	317418	295279	319839
China	2744	75175	2368	133311
Israel	100	3138	1437	93996
France	1408	92383	1139	87235
Indonesia	236	7845	411	22162
Germany	436	15361	330	20320
Spain	265	14305	156	9174
Greece	2337	123162	30	1314
South Africa	2498	20467	--	--
Other countries	1945	62372	2035	69600

Table – 18 : Imports of Slate (By Countries)

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	13	601	146	4663
China	10	240	96	2256
Germany	--	--	5	1203
Brazil	2	208	10	619
Spain	++	123	5	434
Nepal	-	-	30	67
France	-	-	++	58
Switzerland	++	13	++	15
USA	++	5	++	10
Finland	-	-	++	1
Sri Lanka	1	11	-	-
Other countries	++	1	--	--

Table – 19 : Imports of Sandstone (By Countries)

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	52	398	21000	22343
Nepal	-	-	20810	16652
Saudi Arabia	-	-	190	5691
Canada	50	363	-	-
Thailand	2	35	-	-

FUTURE OUTLOOK

Slate is mostly used as roofing material but other uses like cladding and flooring tiles are also gaining momentum. Slates occur widespread in the country and detailed study is required to be conducted to quantify the resources. About 80% production of slate in the country was exported, whereas remaining 20% is consumed in the domestic market.

India has abundant resources, technical know-how, large quarrying base and processing capacity and can safely ensure export growth @20% per annum.

Dimension stone industry has to gear up to meet the increasing demand for exports as well as for domestic consumption in foreseeable future. India is having great export potential as well as large domestic market.

The demand for artifacts specially carved work is on the rise the world over. India with its rich tradition of craftsmanship and trained artisans can embark upon the world scene.

Improved quarrying, finishing and hauling technology, availability of greater variety of stones and the rising cost of alternative construction materials are among the factors that suggest a continuing increase in demand for dimension stones in future.