

SLATE, SANDSTONE AND OTHER DIMENSION STONES



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SLATE, SANDSTONE & OTHER DIMENSION STONES

(FINAL RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

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45 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 being 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 fine-grained, very low-to-low metamorphic rock possessing a well developed fissility (splitting attitude) parallel to the planes of slaty cleavage. It is 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 cleavage planes that are well marked which enable it to be split manually or mechanically into relatively thin slabs. Slate is a low-cost decorative stone used for exterior and interior decoration of buildings. It is significantly used in roofing. It is also used as school slate and also as building dimension stone. Slate has an aesthetic value like other dimension stones, granite and marble. Slate has emerged as a low cost alternative to granite and marble which are comparatively expensive. 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 also been reported from Madhya Pradesh, Haryana, Himachal Pradesh, Jharkhand, Andhra Pradesh, Rajasthan, Uttarakhand, Bihar and Gujarat.

RESOURCES

An attempt has been made to prepare inventory of slate. This may not be complete. The total resources of slate as on 1.4.2010 as per UNFC system are placed at 2.4 million tonnes under unclassified grade. All the resources are located in Andhra Pradesh (Table- 1).

EXPLORATION & DEVELOPMENT

No exploration activities were reported for slate during 2014-15.

PRODUCTION, STOCKS & PRICES

As per GOI Notification S-O.423(E) dated 10.2.2015, slate has been declared as 'Minor Mineral', hence the production beyond January, 2015 is not available with IBM. The production of slate at 218 tonnes in the year 2014-15 (up to January, 2015) decreased by 38% as compared to that in the previous year due to decrease in demand. There was only one reporting mine of slate in both the years (Tables- 2 to 4).

**Table – 1 : Reserves/Resources of Slate as on 1.4.2010
(By Grade / State)**

	Reserves Total (A)	Remaining Resources				Total (B)	Total Resources (A+B)
		Feasibility STD211	Pre-feasibility		Inferred STD333		
			STD221	STD222			
All India: Total	-	-	113	1187	1069	2369	2369
By Grade							
Unclassified	-	-	113	1187	1069	2369	2369
By State							
Andhra Pradesh	-	-	113	1187	1069	2369	2369

Figures rounded off.

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The mine-head closing stocks of slate (excluding stocks of a mine in Madhya Pradesh which reported stocks up to 2012-13) for the year 2014-15 were 15 tonnes as against 11 tonnes in the previous year (Table -5).

The average daily employment of labour in the slate mine during the year was only two as against four in the previous year.

The value of production of slate for 2013-14 decreased to ₹ 1.78 crore from ₹ 2.03 crore in 2012-13 (Table-6).

Table – 2: Producer of Slate, 2014-15

Name and address of producer	Location of mine	
	State	District
Shri Ashok Somany, Khol House, Circular Road, In front of Ramlila Ground, Distt. Rewari- 123 401, Haryana.	Haryana	Rewari

**Table – 3 : Production of Slate, 2012-13 to 2014-15
(By State)**

(Qty in tonnes; Value in ₹ '000)

State	2012-13		2013-14		2014-15 *(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India/ Haryana	278	263	351	332	218	197

* Data up to January, 2015

**Table – 4 : Production of Slate, 2013-14 & 2014-15
(By Sector/State/District)**

(Qty in tonnes; Value in ₹ '000)

State/District	2013-14			2014-15 *(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India/ Private sector	1	351	332	1	218	197
Haryana/ Rewari	1	351	332	1	218	197

* Data up to January, 2015

**Table – 5: Mine-head Closing Stocks of Slate, 2013-14 & 2014-15
(By State)**

(In tonnes)

State	2013-14	2014-15 *(P)
India/ Haryana	11	15

* Data up to January, 2015

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**Table – 6 : Value of Production of Slate
2011-12 to 2013-14
(By States)**

(In ₹'000)

State	2011-12	2012-13	2013-14(P)
India	67187	20332	17834
Andhra Pradesh	16567	5922	6665
Himachal Pradesh	46000	10200	9900
Jammu & Kashmir	40	10	-
Rajasthan	4580	4200	1269

Source: State Governments.

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, 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 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 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 2008) namely, specification for roofing slate tiles (First revision) with respect to requirement of dimensions, physical properties and workmanship of slate tiles used for sloped roof covering.

2. Sandstone

Sandstone is a 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

Occurrences of sandstone in India are spread across 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-

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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 plain in the districts of Jodhpur, Churu, Bikaner and Nagaur. 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 district Vadodara.

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.

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 and is used as building stone.

EXPLORATION & DEVELOPMENT

The DMG, Rajasthan has carried out exploration for sandstone in 2014-15. The details of exploration are furnished in Table -7.

Table – 7: Details of Exploration Activities for Sandstone, 2014-15

Agency/State/ District	Location/ Area	Mapping		Drilling		Sampling (No.)	Remarks/ Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
DMG Rajasthan							
Karauli,	N/v Atalpura, Tehsil Mandrayal; Manrhi Bhat, Chobe Ki Gwari, Tehsil Sapotra & Dundapura, Tehsil Karauli	1:50,000 1:10,000 1:4,000	250 10 4	-	-	-	Occurrence of splittable sandstone for masonry stone was noticed. Total resources were estimated at 9.85 million tonnes.
Bhilwara	N/v Sukhpura, Barisal, Tehsil Bijoliya	1:50,000 1:4,000	10 1	-	-	-	Resources were not estimated.
Jaisalmer	N/v Dhursar, Bhakhri Tehsil Pokhran	1:50,000 1:10,000 1:2,000	100 10 1	-	-	12	Occurrence of blockable sandstone was noticed. Total 16 plots have been delineated. Resources were not estimated
Jodhpur	N/v Bara Kotecha, Balarwa, etc, Tehsil-Osian	1:50,000 1:10,000 1:2,000	100 10 2	-	-	-	Occurrence of blockable sandstone was noticed. Resources were not estimated.
Dholpur	N/v Bhiramad, Padampura, Kacchpura,etc. Tehsil Basedi	1:50,000 1:10,000 1:4,000	250 10 4.05	-	-	-	Occurrence of blockable and splittable sandstone were noticed. Resources at 14.11 million tonnes were estimated.
Barmer	N/v Lalso Ki Dhani, Tehsil Sheo	1:50,000 1:10,000 1:2,000	100 5 3	-	-	-	Occurrence of sandstone was noticed. About 20 plots have been delineated. Resources were not estimated.

PRODUCTION

Data on production of sandstone is not available. However, it is estimated that Rajasthan may be producing about 90% of the 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- 8.

Table – 8: Value of Production of Quartzite & Sandstone*, 2011-12 to 2013-14 (By States)

(In ₹'000)			
State	2011-12	2012-13	2013-14 (P)
India	7737267	7612211	6529443
Himachal Pradesh	93200	155000	1600
Jammu & Kashmir	36728	53355	7534
Madhya Pradesh	491407	11179	-
Rajasthan	7113770	7390200	6517832
Tamil Nadu	2162	2477	2477

Source: State Governments

* Used for purposes of building or for making road metals 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 Bhander Sandstones which are exposed over a large area of about 5,000 sq km in south-eastern Rajasthan, covering Kota, Bundi, Bhilwara, Chittorgarh districts are 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 Sarmathura, Bari, Baseri,

Hindaun, Sapotra, 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. The overburden is removed which is in the form of soil, rubble or non-splittable sandstone. The hard non-splittable sandstone is then 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 or blocks for further processing in the form of slabs.

In conventional mining, the natural vertical joints present in the range from 0.6 m to 60 m is an advantage. 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. The quarrying operation in Rajasthan has gone to the depth of 50 m.

In the 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 are 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.

A majority of quarry owners produce hand-dressed slabs and tiles in different thicknesses. But in the export market normally machine-cut tiles are in demand and 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 a 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.), Kuchchh Stone, Miliolitic Limestone, etc.

OCCURRENCES

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, Anantapur 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 richly endowed 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 Nimbaheera 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 in Bada Bag, Mool Sagar and Kanod villages of Jaisalmer. It contains 42 to 51% calcium oxide and has a thickness of about 3m. It is quarried in the form of blocks

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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.

PRODUCTION

Data on value of production of limestone used in kilns for manufacture of lime to be used as building material is furnished in Table- 9.

MINING AND PROCESSING

Although the mining methods as well as the processing of limestone have changed over the years, still there is a 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 size and thickness to suit the requirement of different building projects. This stone has a good market potential.

**Table – 9: Value of Production of Limestone*
2011-12 to 2013-14
(By States)**

(In ₹'000)

State	2011-12	2012-13	2013-14(P)
India	10920803	12138165	13369120
Andhra Pradesh	16790	16997	17573
Chhattisgarh	2549338	2860753	4084116
Gujarat	1297406	1160346	1016700
Jammu & Kashmir	29025	26283	63816
Madhya Pradesh	1227	12069	860
Rajasthan	6455000	7489700	7614038
Uttarakhand	572017	572017	572017

Source: State Governments

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

EXPLORATION & DEVELOPMENT

No exploration activities were reported for dimension limestone during 2014-15.

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 it has a high resistance to delamination and failure under freezing and thawing conditions.

Bureau of Indian Standards has adopted Specification for Limestone (Slab & Tiles) as IS : 1128 - 1974 (First Revision, reaffirmed 2008).

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 2010) for felsite grinding media and liner stones. Felsite has architectural, industrial and antiquity uses. As per GOI Notification S.O.423(E) dated 10.2.2015, felsite has been declared as 'Minor Mineral', hence the production beyond January, 2015 is not available with IBM.

The production of felsite at 324 tonnes in 2014-15 (up to January, 2015) decreased by 41% as compared to that in the previous year. This decrease is due to shortage of labour in one felsite mine and temporary discontinuance of mining operations in the other felsite mines for want of environmental and forest clearance. There were two reporting mines in the current year whereas there were three reporting mines in the previous year. Two producers operating two mines accounted for the entire production of felsite during the year. All the mines are located in Mandya and Mysore districts of Karnataka (Tables- 10 to 12).

The mine-head closing stocks of felsite in 2014-15 were 4,797 tonnes as against 5,050 tonnes in the previous year (Table-13).

The average daily employment of labour was 7 in 2014-15 as against 11 in the previous year.

Table – 10: Producers of Felsite, 2014-15

Name and address of producer	Location of mine	
	State	District
Smt. S. Rajee V. Raman, Flat No. G-2, "Srivara Krishan", 3 rd Main Road, V. V. Mohalla, Distt. Mysore, Karnataka.	Karnataka	Mysore
Shri J. Madhu, No. 164, K. R. S Road, Mogarahally, Distt. Mandya- 571 438, Karnataka.	Karnataka	Mandya

**Table – 11 : Production of Felsite, 2012-13 to 2014-15
(By State)**

(Qty in tonnes; Value in ₹'000)

State	2012-13		2013-14		2014-15 (P)*	
	Quantity	Value	Quantity	Value	Quantity	Value
India/ Karnataka	1266	909	551	475	324	242

* Data up to January, 2015

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**Table – 12 : Production of Felsite, 2013-14 & 2014-15
(By Sector/State/Districts)**

(Qty in tonnes; Value in ₹'000)

State/District	2013-14			2014-15(P)*		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	3	551	475	2	324	242
Private sector	3	551	475	2	324	242
Karnataka	3	551	475	2	324	242
Mandya	2	239	179	1	117	88
Mysore	1	312	296	1	207	154

* Data up to January, 2015

**Table – 13: Mine-head Closing Stocks of Felsite, 2013-14 & 2014-15
(By State)**

(In tonnes)

State	2013-14	2014-15 (P)*
India	5050	4797
Karnataka	5050	4797

* Data up to January, 2015

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. However, sets of curbstones and flagstones of natural stone (except slate) under heading no. 6801 and worked monumental building stone (excluding slate), tiles, cubes and similar articles of natural stone including slate, under heading no. 6802 can be imported freely. Worked slate and articles of

slate or of agglomerated slate under sub-heading 6803 can also be imported freely. Exports of stone aggregates which are restricted under Chapter 25 of ITC (HS), 2012, Schedule 2-Export policy, are permitted to be exported to Maldives subject to ceiling limits. The limits are 5 lakh tonnes, 5.5 lakh tonnes and 6 lakh tonnes for the years 2011-12, 2012-13 and 2013-14, respectively. The annual ceilings are monitored by CAPEXIL subject to exporters obtaining appropriate clearances.

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

FOREIGN TRADE

Exports

Exports of building and monumental stones (NES) increased considerably to 2.52 million tonnes in 2014-15 from 1.69 million tonnes in 2013-14. Quantity-wise, Bangladesh was the leading buyer accounting for 51% of the total exports, followed by Maldives (29%), UK (5%) and Belgium (3%). Value-wise, UK was the leading buyer, contributing 26% to total value of exports, followed by USA (12%) and Bangladesh (10%) (Table- 14).

In 2014-15, the total exports of slate increased slightly to 100 thousand tonnes from 86 thousand tonnes in 2013-14. Out of the total exports of slate during 2014-15, 23,922 tonnes was of slate (worked), while the bulk of exports, i.e., 76,525 tonnes was of slate (others). USA was the leading buyer, accounting for over 44% value of the total slate exported followed by UK (12%) and Canada (5%) (Tables- 15 to 17).

Table – 14: Exports of Building and Monumental Stones, NES (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1686357	6268602	2519515	7771233
UK	107818	1672610	135067	2043920
USA	14297	822296	63302	951878
Maldives	112319	142864	731957	879114
Bangladesh	1176941	550640	1274076	763647
Belgium	86315	585938	80444	541792
France	49138	428563	41528	309684
Germany	18994	252183	22558	263486
Italy	19557	277608	16217	220409
Canada	5341	119415	8053	209890
UAE	9301	142092	9453	136664
Other countries	86336	1274393	136860	1450749

In 2014-15, the exports of sandstone increased slightly to 0.63 million tonnes from 0.54 million tonnes in the previous year. Quantity-wise, UK was the leading buyer in 2014-15 with 57% of the total sandstone exported followed by Belgium with 5% and value-wise also UK was the leading buyer with 61% and USA 5% (Table- 18).

Imports

During 2014-15, imports of building & monumental stones (NES) decreased considerably to 0.77 million tonnes from 0.96 million tonnes in the previous year. Bangladesh was the leading supplier contributing 63% to the total value of imports followed by Nepal (16%) (Table- 19).

Imports of slate during 2014-15 were 472 tonnes compared to 850 tonnes in 2013-14. There was negligible import of sandstone reported during year 2014-15 (Tables-20 to 21).

Table – 15 : Exports of Slate (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	86090	1688206	100447	1867164
USA	35095	768470	41061	815340
UK	14634	173951	18906	215556
Canada	3473	63294	4513	96531
Germany	1535	56250	1693	79710
Australia	3277	49410	3533	44033
Mexico	1882	33598	2299	40014
Belgium	2372	34327	2543	34580
Indonesia	1308	41416	1314	31056
Spain	501	21146	1124	28308
Chinese Taipei/ Taiwan	233	19373	288	25601
Other countries	21780	426971	23173	456435

SLATE, SANDSTONE AND OTHER DIMENSION STONES

**Table – 16 : Exports of Slate (Others)
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	69984	1146507	76525	1207337
USA	25757	509960	28897	533316
UK	13530	141391	17260	174268
Canada	3331	54214	3750	77718
Belgium	2344	33424	2424	31511
Australia	2985	39052	2956	30577
Mexico	1755	27848	1865	29020
Indonesia	1064	29861	1087	24269
Malaysia	1158	15684	1403	19580
Germany	1313	21991	1258	17280
France	718	16930	794	16864
Other countries	16029	256152	14831	252934

**Table – 17 : Exports of Slate (Worked)
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	16106	541699	23922	659827
USA	9338	258510	12164	282024
Germany	222	34258	435	62430
UK	1104	32559	1646	41288
Chinese Taipei/ Taiwan	56	16770	84	23333
Canada	142	9080	763	18813
Spain	195	14204	294	14664
Poland	39	1898	418	14263
Thailand	206	8316	354	14213
Australia	292	10358	577	13456
Bangladesh	1325	6030	2524	13447
Other countries	3187	149716	4663	161896

**Table – 18 : Exports of Sandstone
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	540874	7579286	627008	8523123
UK	329143	4760663	355039	5220718
USA	15016	284215	27433	449763
Canada	20632	408021	21272	386230
Belgium	14405	140982	33527	283952
Germany	15576	228499	25197	263064
Australia	11495	216120	16373	253908
Italy	16682	213015	26255	241209
UAE	18537	214719	18569	214134
Korea, Rep. of	11112	145644	12234	153384
France	14840	135505	14457	126944
Other countries	73436	831903	76652	929817

SLATE, SANDSTONE AND OTHER DIMENSION STONES

Table – 19: Imports of Building and Monumental Stones, NES (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	958905	1147451	766721	1481235
Bangladesh	251907	387097	577187	935185
Nepal	699543	533753	173116	233106
China	2062	64841	2755	63771
Greece	1	114	8381	48904
Indonesia	264	12747	559	31327
South Africa	977	21335	47	31147
Germany	686	37991	490	28836
UK	1302	14930	2282	26594
Italy	49	7062	763	25055
Spain	48	2086	239	7426
Other countries	2066	65495	902	49884

Table – 20: Imports of Slate (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	850	23951	472	16814
China	815	21371	350	11085
Canada	-	-	120	5277
UK	29	450	1	189
Italy	-	123	1	103
Spain	4	1696	++	71
Germany	1	115	++	64
Korea, Rep. of	-	-	++	16
Switzerland	-	-	++	9
Other countries	1	196	-	-

Table – 21 : Imports of Sandstone (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	-	-	++	18
China	-	-	++	18
Other countries	-	-	-	-

FUTURE OUTLOOK

Slate is mostly used as a 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. The demand for dimension stones including sandstone & others and stone products is anticipated to grow at around 15%. A similar growth is also expected in exports.

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

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 consistent increase in demand for dimension stones in future.