

Export Mineral Economics of Indian Sandstone

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Abstract: *The sandstone is a hard and resistant rock hence a great variety of products are prepared and demanded by users worldwide. The sandstone of India is in good demand from various countries due to its quality and the artwork of our artisans. The county produces great variety of products and are used in Monuments, and buildings etc. The International Market demand of sandstone is growing continuously observed from in this study. The quantity of export of sandstone from India and revenue collection is consistently increasing.*

Keywords: *Sandstone, Mining, Quantity, Revenue, Rock, Export, Economics.*

1. INTRODUCTION:

India is one of the most potential country with regard to mineral production. It possesses a very wide spectrum of deposits and production of dimensional stones which includes Granite, Rhyolite, Porphyry, Marble, Serpentine, Sandstone, Limestone, Slate, Phyllite/ Shale, Quartzite, Basalt, Schist, Gniess and many other rocks as per their availability in particular locality in various parts of the country.

The Indian stone industry has been evolved into the production and manufacturing of a vast variety of types of items viz. sculptures, Statues, blocks, flooring slabs, roofing slabs structural slabs, monuments, tomb stones, , cobbles, pebbles, landscape garden stones etc.

The wide ranges of decorative stones like Sandstone, Marble, Granite, etc. found in India. The good quantity of these decorative stone is exported to various countries by mine owners, commercial manufacturers and suppliers. The sandstone is one of the decorative stone which is exported in good quantity worldwide since last few years.

2. OBJECTIVE OF STUDY:

In this study main objectives are as under:

- Study of Sandstone and its quality with regard to export.
- Study of year wise Export quantity of Sandstone.
- Exploration of Future Market / Countries and their Requirements regarding Sandstone.
- Demand of Sandstone in International market.
- Research & Development for Sandstone uses etc.

3. GEOLOGY OF SANDSTONE:

The Sandstone is a clastic sedimentary rock formed after deposition and lithification of clastic materials in sedimentary basin. These are composed mainly of sand-sized (0.0625 to 2 mm) mineral particles or rock fragments of pre-existing rocks after their weathering and erosion. Most sandstones are composed of quartz along with some other accessory minerals which are bit resistant to weathering at the surface of the Earth. The sandstones are found in a variety of colours due to presence of impurities within the rock. The common colours of sandstones are red (light to dark or flashy colours), tan, brown, yellow, grey, pink, white, black etc. Since the sandstone rock is hard and resistant so its beds are often form highly visible cliffs and other topographic features and can easily be recognised with certain colours of sandstones in different regions.

The rock formations that are composed of sandstone usually allow the percolation of water and other fluids and as it is porous enough to allow the liquids to pass through or to store large quantities and hence making them valuable aquifers and petroleum reservoirs. The fine-grained sandstones are better able to filter out pollutants present in the water than are rocks with cracks and crevices, such as limestone or other rocks fractured by seismic activity, sometimes some soluble salts present in the sandstone may be dissolved.

The quartz-bearing sandstones are sometimes converted into quartzite through thermal metamorphism, usually related to tectonic activity within orogenic belts.

4. SANDSTONE DEPOSIT IN INDIA:

Geologically the sandstone rocks are found in almost the geologic formations from Proterozoic to Recent. The Precambrian rocks lack in sandstones because all the rocks of this era are metamorphosed whereas the sandstone rock is of sedimentary origin. The sandstones of Precambrian Time are now found as quartzite which also a tough stone hence used as dimensional stone and as road metal. The most popular sandstones are found in the Vindhyan Supergroup and in the Marwar Supergroup.

Sandstone reserves in India are found over the states of Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Madhya Pradesh, Meghalaya, Mizoram, Karnataka, Orissa, Rajasthan, Uttar Pradesh, Tamil Nadu, West Bengal etc. Over 90% of the workable deposits of sandstone are in Rajasthan, spread over the districts of Bharatpur, Dholpur, Kota, Sawai-Madhopur, Karauli, Bundi, Jhalawar, Chittorgarh, Jodhpur, Bikaner, Nagaur and Jaisalmer.

India is among one of the leading countries when it comes to mining and export of sandstone rock. The best part with Sandstone from India is that it is available in different colours and considered best for interior as well as exterior use. Some commercially popular sandstone products from India include names like: Tint Mint, White Mint, Mint Fossils, Modak, Agra Red, Rainbow Sandstone, Raj Green, Teak, Buff Brown, Dhoplur Chocolate, Beige, Dhoplur Pink, Mandana Red, Jodhpur Pink, Jodhpur Red, Jaisalmer Yellow etc.

The varieties of sandstones are available in a number of finishes and come with great strength. However, a commercial variety of sandstone called Rainbow is found in layered form, so is not suitable when good thickness and toughness is required. The Jodhpur Sandstone is best when used in front elevation and it also possesses high compressive strength.

5. DESCRIPTION OF PROBLEMS & ISSUES:

The demand for export of sandstone is continuously growing in the current scenario. The huge quantity is required to maintain the supply in the International Market with upcoming requirement for sandstone but government's concerned departments are deducing proper policies to control and facilitate quality and quantity for demand and supply of sandstone. The government departments are also developing policies for proper management of waste and scrap of utilization sandstone for supply in National and International Market.

The Attention and awareness is also required for the exploration and prospecting of present and new sandstone deposits to maintain the mining and supply for the upcoming and future National and International Market Sandstone.

6. METHOD:

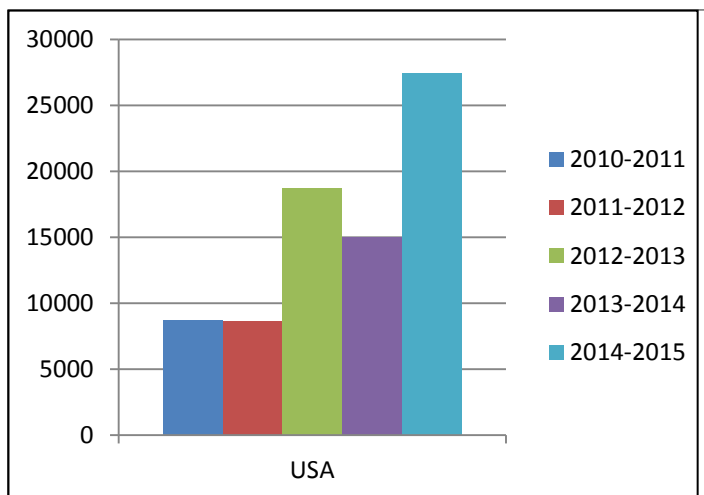
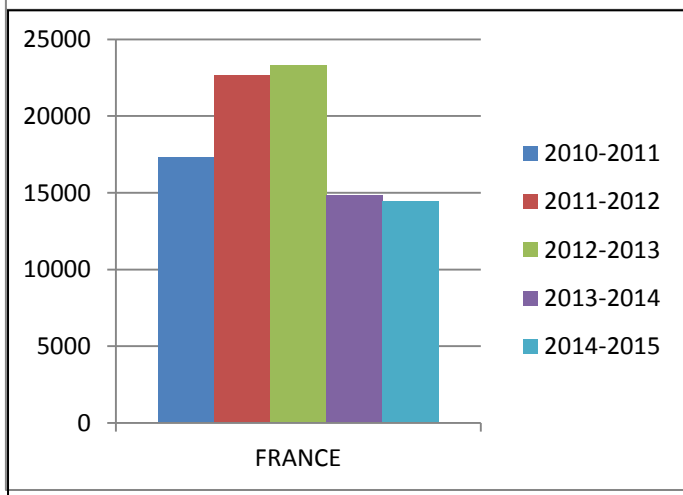
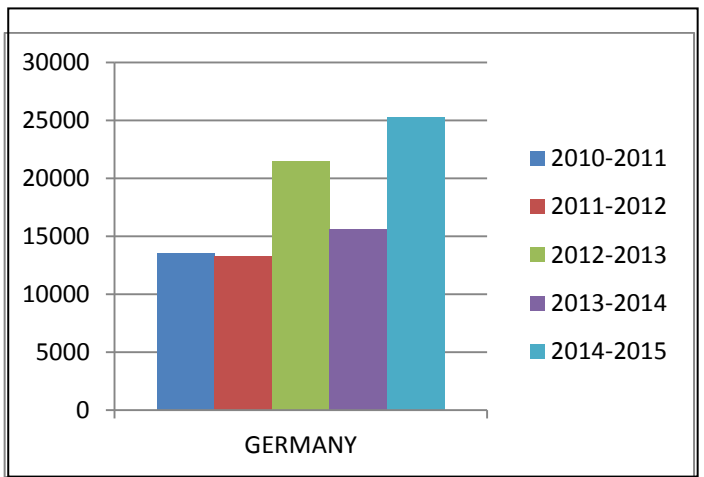
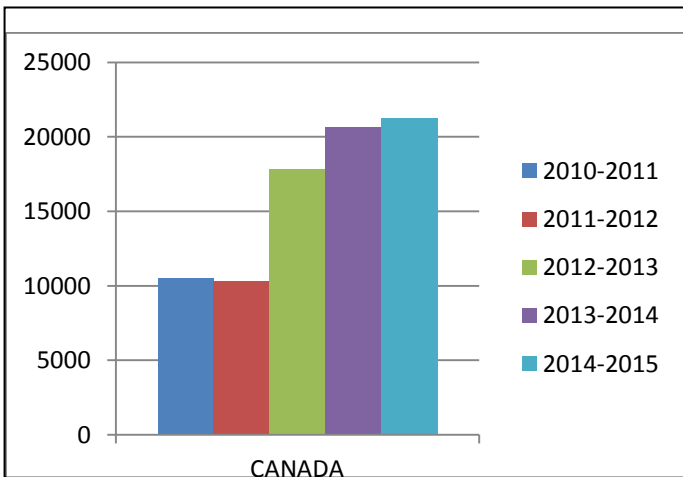
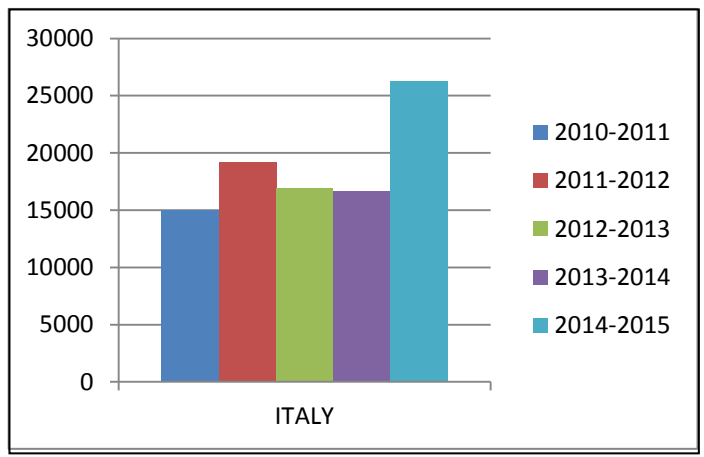
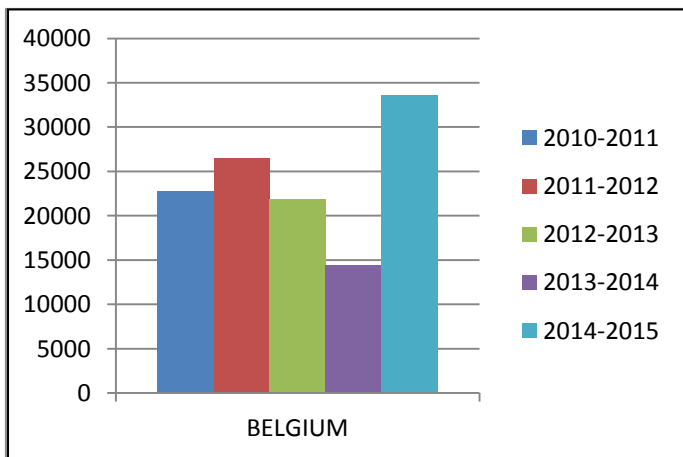
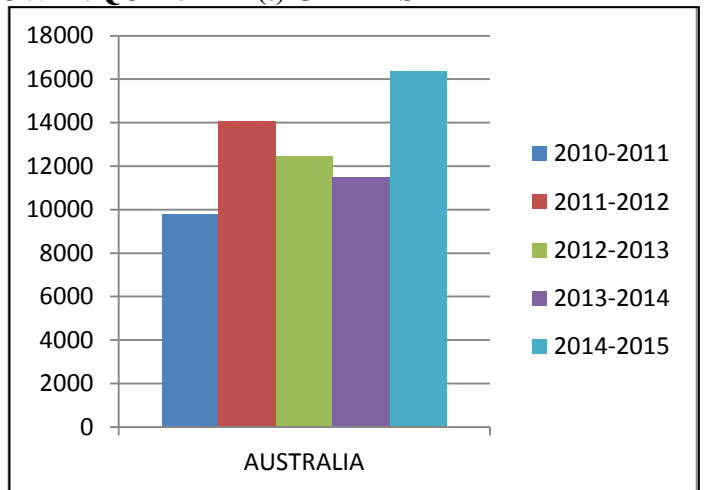
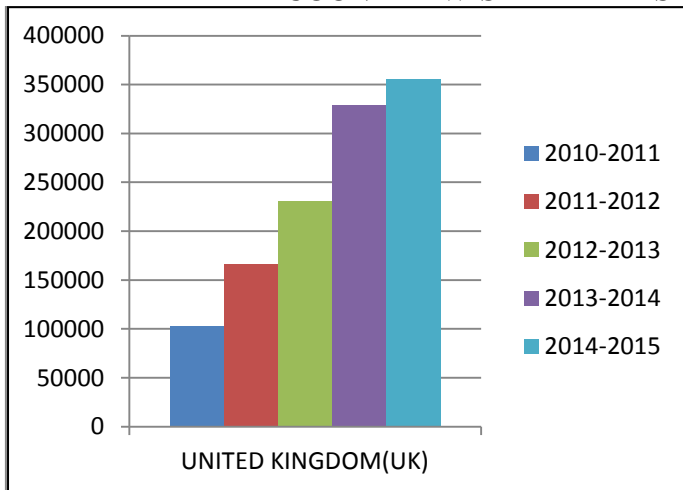
The Statistical data of exports a period of continuous five financial years from 2010-11 to 2014-15 has been collected from various agencies and presented in tabular form and Graphs has also been prepared and presented in this study.

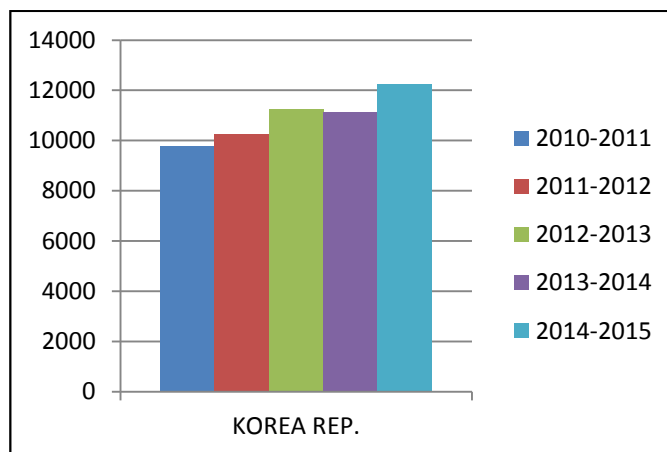
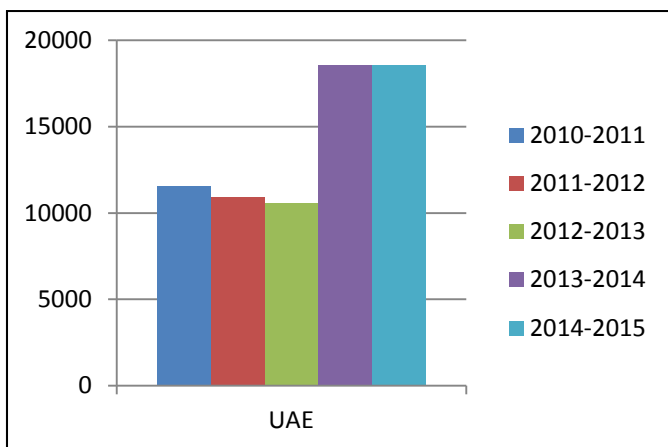
7. STATISTICAL DATA & GRAPHS SHOWN EXPORT QUANTITY OF LAST FIVE YEARS:

YEARLY FIGURES OF (QUANTITY & VALUE)										
Name of Country	2010-2011		2011-2012		2012-2013		2013-2014		2014-2015	
	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)	(t)	(₹'000)	(t)	(₹'000)	(t)	(₹'000)
UK	102433	1368988	166508	1828772	230469	2921188	329143	4760663	355039	5220718
AUSTRALIA	9790	152895	14061	236903	12426	179515	11495	216120	16373	253908
BELGIUM	22776	155132	26500	183277	21862	168000	14405	140982	33527	283952
ITALY	14974	146110	19193	174311	16879	148720	16682	213015	26255	241209
CANADA	10518	125035	10287	158532	17788	309135	20632	408021	21272	386230
GERMANY	13567	139289	13255	144540	21493	202530	15576	228499	25197	263064
FRANCE	17304	106655	22678	127452	23279	125169	14840	135505	14457	126944
USA	8704	93054	8628	113973	18724	189942	15016	284215	27433	449763
UAE	11530	111778	10900	109829	10538	127401	18537	214719	18569	214134
KOREA REP	9764	95733	10263	105955	11235	119015	11112	145644	12234	153384
OTHER CO.	82778	718316	67965	682328	64873	666987	73436	831903	76652	929817
ALL CO.	304138	3212985	370238	3865872	449566	5157602	540874	7579286	627008	8523123

Table – 1. YEARLY FIGURE'S OF QUANTITY & REVENUE

COUNTRY WISE YEARLY SHOWN QUANTITY(t) GRAPHS





8. ANALYSIS:-

The data collected analyzed critically shows that in general the demand for sandstone demand is increasing in the international market and the revenue of the money collection is also increasing consistently.

The United Kingdom (UK) emerged as the biggest buyer of sandstone from India in comparison to other countries. Other countries are quite behind in importing sandstone from India. The countries like Belgium, Italy, Canada, Germany, France, UAE etc also for buying sandstone and the import quantity is also increasing in general in five years of study period. There is a clear and consistent increasing trend in export to the countries like United Kingdom, Canada and Republic of Korea. The countries like Australia, Belgium, Italy, Germany, USA and UAE show some ups and down in importing sandstone from India but in the last year of study i.e. 2014-15 it shows sufficient increase in these countries. The France is the only country which also show some ups and down in importing sandstone from India but it show increase in initial three years and in last two years it shows decreasing trend in importing sandstone from India.

Whether the study show increase or ups and down in quantity of export supply of sandstone but the study of revenue of money collected of all the countries included importing sandstone from show increasing trend, which is a positive sign in terms of economics.

As per the data and its analysis in this study, it can easily be said that the future demand of Sandstone will definitely increase in almost all countries and some new countries may also come ford to import sandstone from India and the money collection through sandstone export will also increase satisfactorily.

Since, as per prediction of this study the demand for sandstone export will increase so, it is required to the geologists, mining engineers, mine owners, suppliers and the government departments must gear up explore deposits and developed deposits of sandstone and quality of finished product should also be improved for maintain continuous quantity and quality of supply of desired product to fulfill the upcoming demand of Sandstone in International Market.

9. CONCLUSION: The study data of five years the Sandstone Export shows that:

There are mainly nine countries along with some other countries with small quantity which buy sandstone from India. Main importing countries are United Kingdom (UK), Australia, Belgium, Italy, Canada, Germany, USA, France and UAE. United Kingdom (UK) is our largest buyer of Sandstone in comparison to other countries. The countries like United Kingdom, Canada and Republic of Korea show consistent increasing trend in export but to the countries like Australia, Belgium, Italy, Germany, USA, UAE and France show ups and down in export. As a whole the export of sandstone is increasing consistently.

The data of revenue of money collected through export of sandstone show consistent increasing trend which a good sign for Indian Economy. The revenue in export of sandstone is also increasing consistently

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