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Production and Consumption of Cement in India: An Overview

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Abstract

The infrastructure plays an important role in the economic growth of a country. Across different industries the construction industry is one among all which fosters the development of infrastructure. Furthermore, the sprawl of the construction sector facilitates the production of cement. India with 298 million tons in year 2022 became the second largest producer of cement in the world. In India there are 210 large cement plants, from which 32% of cement production occurs from South India, 20% from North India,15% from west India, 13% from Central India and remaining 20% of the cement production occurs from East India. The production of cement in India during 2011-12 was 223.50 million tons, which has increased to 374.55 million tons in 2022-23. Likewise, the consumption of cement has been significantly increased from 222.37 million tons in 2011-2012 to 375.19 million tons in 2022-23 respectively. India imported the cement with a quantity of 7.52 Lakh tons in 2012 which reached up to 7.27 Lakh tons in 2023. The export of cement in year 2012 was 21.36 Lakh tons and it reached upto 11.66 Lakh tons in year 2022. India imports cement from UAE (330 thousand tons in 2022), Bangladesh (207.1 thousand tons in 2022), Bhutan (195.98 thousand tons in 2022), Oman (73 thousand tons in 2022) and China (3.5 thousand tons in 2022). The countries to which India exports cement are Sri Lanka (350.6 crore tons in 2022). Nepal (203.4 crore tons in 2022), Maldives (178.7 crore tons in 2022), UAE (67.7 crore tons in 2022) and Mauritius (65.4 crore tons in 2022). The cement industry is one of the major industry in India which is contributing the national economy directly and indirectly. In order to sustain this industry, the Govt. of India is approving different investment schemes.

Keywords: Cement industry • Production • Consumption • Physical activity

Introduction

Cement industry is regarded as the key industries for the growth and development of India and other countries [1]. This industry has played a pivotal role in the infrastructure development of the country [2]. Being a simple substance, cement is a major contributor to the GDP of India [3]. Cement is essentially a blend of substances made of calcium oxide, silica, aluminum oxide and iron oxide, mostly silicates and calcium aluminates [4]. The corporate sector, finance, real estate and infrastructure sectors all have a major role in determining cement demand. Worldwide, cement is used for all types of construction projects, including residential and commercial building projects, as well as the development of infrastructure including ports, highways, power plants and other facilities. Due to positive trends like cost management and ongoing technical advancement, the Indian cement industry is globally competitive. The third-largest coal user sector in India is the cement industry, which uses a lot of energy [5]. It is cutting-edge and makes use of some of the greatest technologies available today. Additionally, the business has a lot of room to grow because high-quality limestone can be found practically everywhere in the nation.

The Indian cement industry started off in 1914 with a single, 1000ton-per-year facility in Porbandar, Gujarat [6]. India has since overtaken China as the second-largest cement-producing nation in the world. There are now 81 cement companies in India, 210 are large cement plants, with a capacity of 358.64 million tons. Additionally, there are other micro and small cement facilities with a capacity of around 10 million tons. The roller coaster ride the Indian cement industry had since its start in 1914 has been a defining feature of the sector's existence for the past 100 years. The cement business has changed significantly from a seller's market to a buyer's

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market since the days of scarcity, strict regulations and imports.

At present India is the world's second-largest cement manufacturer [7]. It makes up more than 8% of the installed capacity worldwide. The cement industry is anticipated to gain the most from India's potential for expansion in the infrastructure and building sectors. The desire for rural housing in India has also increased the usage of cement, which is one of the cheapest items to purchase in terms of rupees per kg. One of the key factors driving demand for the cement industry is the robust development of the industrial sector, which has completely recovered from the COVID-19 pandemic shock. As a result, there is a great chance that the long-term need for the cement sector will raise. But before that it's most essential to have a proper and update information regarding the scenario of cement industry in India. Thus in the present study the overview about the production and consumption of the cement in Indian context was investigated and reported.

Materials and Methods

The aim of the present study is to investigate the production and consumption of cement in India and also highlight the status of cement industry in India. Data has been collected from numerous secondary sources through a desk review. This covers study of documents and reports from all cement industrial sectors (with a focus on the medium and large scale). The secondary data was collected between 2015-16 to 2022-23. The secondary data sources were taken from related literature, while the remaining data came from manuals, reports and other research papers. On the manufacturing industry sectors, reputable journals, books, various articles, conferences, magazines, newsletters, newspapers, websites and other sources were taken into consideration. For the review, information was also gathered from the currently in use working papers, manuals, procedures, reports, statistical data, rules, regulations and standards. After the collection of data, the finished data was expressed in tables, figures and discussed in the result section of this research paper. The collected data was subjected to growth analysis to determine the present status of cement industry. Further the data was subjected to Analysis of Variance (ANOVA) for determining the significance of growth in the cement industry.

Results and Discussion

Regarding energy use, quality assurance, environmental sustainability and adaptability in pursuing new technology choices, the Indian cement industry is ranked as one of the top performing industries across multiple industrial sectors. The cement business in India is closely related to a number of other industries, including infrastructure, building, housing, transportation, coal, electricity, steel, etc. It plays a crucial part in putting into action a number of government major programmers and initiatives, including homes for everyone, smart cities, concrete roads, Dedicated Freight Corridors (DFC), the clean India mission, ultra-mega power projects, waterways, etc., [8]. The National Council for Cement and Building Materials (NCCBM) forecasts that India's cement industry would increase its capacity by about 80 million tons by the year 2025 [9]. India is the world's

second-largest cement manufacturer after China, with 298 million tons. It produces cement at 8% of the installed capacity in the world. It has 210 big cement factories in total, 77 of which are located in the states of Tamil Nadu, Rajasthan and Andhra Pradesh. In 2022, India's cement market was expected to be 3,644.5 million tons. By 2028, the sector expects to produce 4,832.6 million tons at a Compound Annual Growth Rate (CAGR) of 4.94% [10].

Cement exports, which were 33.73 Lakh tons in 2015-16, fell to 11.6 Lakh tons in 2021-22. Further its predicted to reach 6.9 Lakh tons in year 2022-23 respectively (Figure 1). The fall in the cement export could be associated with the increase in the internal demand of cement in India. Furthermore, in future, the global demand for Indian cement is likely to be a bit subdued given the slowdown and looming recessionary fears. The countries to which India exports cement are Sri Lanka (350.6 crore tons in 2022), Nepal (203.4 crore tons in 2022), Maldives (178.7 crore tons in 2022), UAE (67.7 crore tons in 2022) and Mauritius (65.4 crore tons in 2022).



Figure 1. Shows the import and export quantity (in lakh tons) of cement in India from 2015-16 to 2022-23.

Due to the epidemic, India's imports of cement were also dramatically decreased, falling from 17.69 lakh tons in 2017-18 to 7.52 lakh tons in 2019-20 (Figure 1). As local demand increased, India's imports increased from 7.52 lakh tons in 2019-20 to 8.16 lakh tons in 2021-22. India imports cement from UAE (330 thousand tons in 2022), Bangladesh (207.1 thousand tons in 2022), Bhutan (195.98 thousand tons in 2022), Oman (73 thousand tons in 2022) and China (3.5 thousand tons in 2022) [11].

In 2022-2023, it was predicted that India's total cement consumption will surpass 370 million tons. The domestic consumption for the year was probably 373.1 million tons, up 6.3% from the year before. The consumption increase in the first half of the FY 2023 was 10%, which was fairly good. In the second half of FY 2023, it was anticipated that consumption from the real estate and infrastructure construction industries would stay constant. With 351 million tons consumed in 2021-22, cement consumption in India reached a record high, considerably exceeding the 328 million tons consumed in the previous year. Cement consumption was largely supported by a strong demand from the real estate industry, driven by an increase in home building and infrastructure construction, which was in turn supported by an increase in government spending on infrastructure.

There are several different varieties of cement produced in India by cement producers, including portland cement, PPC cement, high strength cement, marine technology cement, blended cement, fly ash cement, slag based cement, silica based cement and high alumina cement. Cement production in India increased to 351 million tons in FY 2022 from 285 million tons in FY 2021. Domestic output has surpassed pre-COVID levels with a 7% rise (Table 1).

Table 1. Growth trend of total production (MT) and consumption (MT) of cement industries of India during a period of 2015-16 to 2022-23.

S. no	Year	Production (MT)			Consumption (MT)		
		Total production	Difference	Growth rate (%) on basis of initial year	Total consumption	Difference	Growth rate (%) on basis of initial year
1	2015-16	273.85			271.24		
2	2016-17	270.37	-3.48	-1.2708	266.82	-4.42	-1.6296
3	2017-18	287.964	14.114	5.1539	284.72	13.48	4.9698
4	2018-19	327.722	53.872	227.6538	324.92	53.68	265.6242
5	2019-20	327.26	53.41	225.7396	327.92	56.68	280.4691
6	2020-21	284.91	11.06	46.7456	285.3	14.06	69.573
7	2021-22	350.59	76.74	324.3449	351.07	79.83	395.022
8	2022-23	374.55	100.7	425.6128	375.19	103.95	514.3748
9	Avg	312.152	43.774	185.0115	310.898	45.323	224.2707
10	SD	38.511	38.09	160.9883	39.803	39.354	194.7347
11	F-cal	5.117			4.392		
12	F-crit	3.86			3.86		
13	P-value	0.025*			0.036*		
14	Sig	Significant			Significant		
15	Но	Rejected			Rejected		

Table shows that the growth of cement consumption was proportional to the cement consumption in India. We can observe that the cement production and consumption have shown a positive parallel growth in India. Cement production increased by 10.9% from April to December 2022 in comparison to the same time period the previous year. The output of cement increased by 2,935 thousand tons in December 2022 alone compared to December 2021. The epidemic and the limitations placed on economic activity with the ensuing nationwide lockdowns were the causes of the decline in cement output in 2020-21. The growth trend analysis of the cement production and cement consumption in India was estimated and represented in Table 1. It was observed from the ANOVA summary that there is a significant increase (for production p=0.025, for consumption p=0.036) in the growth cement production and consumption in India.

In conclusion, the strong long-term growth fundamentals of the cement sector would be a big pull for FDI (Foreign Direct Investment) as India seeks foreign investment to promote "make in India," given the necessity to boost cement production close to the sources of demand. Despite a 300 million ton fall in FY 2021 caused by a drop in domestic demand during the pandemic, cement output has remained sufficient in recent years. Additionally, the steadfastly infrastructure-

focused union budget increased demand for the sector in the next years. Furthermore, the robust demand coming from the housing and infrastructure sectors is helping to improve the outlook for India's cement business.

Conclusion

Cement industry is regarded as the key industries for the growth and development of India and other countries. it's most essential to have a proper and update information regarding the scenario of cement industry in India. Thus in the present study the overview about the production and consumption of the cement in Indian context was investigated and reported. The National Council for Cement and Building Materials (NCCBM) forecasts that India's cement industry would increase its capacity by about 80 million tons by the year 2025. India is the world's second largest cement manufacturer after China, with 298 million tons (FY 2022). It produces cement at 8% of the installed capacity in the world. It has 210 big cement factories in total, 77 of which are located in the states of Tamil Nadu, Rajasthan and Andhra Pradesh. In 2022, India's cement market was expected to be 3,644.5 million tons. By 2028, the sector expects to produce 4,832.6 million tons at a Compound Annual Growth Rate (CAGR) of 4.94%. Cement exports, which were 33.73 lakh tons in 2015–16, fell to 11.6 lakh tons in 2021-22. Further its predicted to reach 6.9 lakh tons in year 2022-23 respectively Due to the epidemic, India's imports of cement were also dramatically decreased, falling from 17.69 lakh tons in 2017-18 to 7.52 lakh tons in 2019-20. As local demand increased, India's imports increased from 7.52 lakh tons in 2019-020 to 8.16 lakh tons in 2021-22. It was observed from the ANOVA summary that there is a significant increase (for production p=0.025, for consumption p=0.036) in the growth cement production and consumption in India. In conclusion, the strong long-term growth fundamentals of the cement sector would be a big pull for FDI (Foreign Direct Investment) as India seeks foreign investment to promote "make in India," given the necessity to boost cement production close to the sources of demand.

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Conflict of Interest

The authors declare no conflict of interest.

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