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History & Growth of Cement industry in India - A Study

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Abstract

This paper attempts to study the history, Evolution of Cement industry in India**.** Being one of the basic elements for setting up strong and healthy infrastructure, Cement plays a crucial role in economic development of any country. Having more than a hundred and fifty years history, it has been used extensively in construction of anything, from a small building to a mammoth multipurpose project. The history of the cement industry in India dates back to the 1889 when a Kolkata-based company started manufacturing cement from Argillaceous. But the industry started getting the organized shape in the early 1900s. In 1914, India Cements Company Ltd, was established in Porbandar Gujarat with a capacity of 10,000 tons. Though the cement industry has been in existence since 1914, appreciable growth in the cement production has been witnessed only after the introduction of partial decontrol in 1982 culminating in total decontrol in 1989 and delicensing in 1991. With the implementation of liberalisation policies of the government in 1991 followed by government's thrust on infrastructure development in the country, the pace of the growth of the cement industry has been unprecedented. At present India is the second largest cement producing country in the world, next only to China both in quality and technology. With the adoption of massive modernisation and assimilation of state-of-the-art technology, Indian cement plants are today the most energy-efficient and environment-friendly and are comparable to the best in the world in all respects, whether it is size of the kiln, technology, energy consumption or environment-friendliness. The economic development of every nation calls for construction activity on an extensive scale. Production of cement in the world has increased over the years.

Cement industry of India is the second largest producer of cement in world. In financial year 2012-2013, the total cement production capacity is about 347 million tonnes. It contributes very high in Indian GDP. Housing is the major sector of cement consumption about 67% of the total consumption. Cement industry is very vast and higher revenue is being paid by this sector to government of Rajasthan.1 Last decade cement industry has a compound growth of 8% with increase in housing sector. In recent years the growth is not so good as compared to earlier decade, because of slow economical growth. Cement, being a bulk commodity, the per capita consumption is still very less, and because of this there is high possibility of growth of

cement industry. At present Lafarge, Ultratech and Wonder cement have installed high capacitive plants which will further increase the production of cement in India.

Keywords: Progress, Cement, Manufacturers, Industry, Indian, Trend.

Introduction

Since independence in the year 1947, cement in India remained a controlled commodity for nearly four decades. The price and distribution of cement were controlled by the Government. In the controlled era, prices fixed were not attractive enough to reinvest in the cement industry, to modernize plant and machinery and to create new capacities; hence there was a gap between demand and supply and cement shortages continued all along the control period. As a result, both, the cement industry and the consumers suffered. Cement produced was as per the specifications laid down by the Bureau of Indian Standards (BIS). The choice of cement (and concrete) as per the application was unknown and the situation did not offer any motivation towards productivity enhancement of cement manufacturing units as well as towards the quality improvement of cement. As a part of liberalization policy, the Government of India started gradual " decontrol " of cement in 1977 which then gave 12% post tax return on net worth on new capacity creation. It provided the initial boost to cement industry followed by partial decontrol in 1982 and finally cement became a 'free commodity' in the year 1989. These policy decisions made a positive impact both on the quality as well as the economy of the cement industry. This has helped in reversing the situation of cement shortages to cement surplus. Cement is now available off-the-shelf. The cement industry has made phenomenal progress in terms of volume, technology and product upgradation. It has the state-of-the-art modern large capacity plants. The quality of Indian cement is at par with the best produced anywhere in the world. Today India is world's second largest cement producing country, with an installed capacity of 160.24 x 10 6 t/a. The energy consumption too-both thermal and electrical-per unit mass production was brought down, through productivity enhancement and modernization efforts on the part of cement plants. The quality of cement also improved impressively, with better strength and durability characteristics. The most significant aspect of this change is the shift in consumer preference from 'high strength' to 'high performance' or durable concrete, which was prompted by greater quality awareness among the consumers and high cost of structural repairs. This general improvement in the quality of concrete was achieved through greater use of mineral admixtures, which are industrial wastes, namely fly ash and blast furnace slag, in cement and concrete. The national standards and the codes of practice have also been revised and supported the change. The greater use of industrial wastes as mineral admixtures has led the cement and construction industry in India on the path of sustainable development.

The Indian cement industry has evolved significantly in the last two decades, going through all the phases of typical cyclical growth process. After a period of over-supply and a phase of massive capacity additions, the industry is currently in a consolidation phase. With sound economic growth and infrastructure development, the demand for cement is on an upward trend. Further addition to capacity is coming up to cater to the increasing demand for cements. India is the second largest producer of cement, after China. With a capacity of 160 m.t. in 2007, it produced 142 m.t. in 2006. The per capita consumption of cement in India is 125 kg which is only about a third of the world average. It indicates the growth potential for this industry. The demand for cement mainly depends on the level of development and the rate of growth of the economy. In the post deregulation era, production of cement rose from 23.5 m.t.in 1983 to 44.1 m.t.in 1989 and to 142 m.t. in 2006.Deepak(2007).As of March 2007, the installed capacity of the cement industry stood at 160 m.t. but the capacity utilisation was 83 percent. Over

a 5-year period, capacity has grown at six per cent as against eight per cent growth in cement consumption. Major players in the industry are in fact, operating at 90 to 100 per cent of capacity. Many have announced expansion plans to meet the growing demand. Major capacity additions will be completed by the end of the year 2008-09.The increase in demand for cement has attracted global majors to India. In a short span of one year (2005-06), four of the top five cement companies of the world entered into India either through mergers or acquisitions or joint ventures or green field projects. These include France's Lafarge, Switzerlands' Holicm, Italy's Italcementi and Germany's Heldelberg cement. The industry has witnessed flurry of mergers and acquisitions among domestic players also, bringing smaller players under the umbrella of large players, such as ACC, Gujarat Ambuja, Grasim Industries, Ultratech and India Cements which in turn have come under the leadership of global players like Lafarge, Holicm, Italcements and Heldelberg. Over the past three years, the share of the top five players in India has increased in each region due to the on-going consolidation in the industry. Now, the top five players share 58 per cent of the market.Srinivasan(2008) The cement industry has always been conscious of the need to keep pace with demand and has already initiated measures for new capacities to the tune of 100 m.t.to be commissioned between 2007 and 2012. This will attract an investment of US $10 billion. Deepak(2007).Cement companies made a massive profit during the construction boom in the fiscal year 2006-07. It was a year that saw their net profit rise almost three-fold, despite accusations by the government of burdening consumers with high prices. Net sales of cement companies went up by 50.5 per cent during the year while profits zoomed by 183.4 per cent. The net profit margin for the cement and cement products improved from 9.2 per cent to 17.3 per cent during 2006-07 (Deepak2007).

Objective:

This paper intends to explore and analyze **the progress of Indian cements industry since inception,** in terms of its growth in installed capacity, production, exports, and value additions;

Discovery of Cement

John Smeaton, who is also known as "father of civil engineering" and credited for design of many bridges, canals, harbors etc. was the first proclaimed civil engineer and pioneered the use of 'hydraulic lime', which led to discovery of modern cement. The common cement or Portland cement was prepared and Patented by **Joseph Aspdin** in 1824. In the later part of 19th century, cement production was taken up by many countries many decades after the first patent was taken by Aspdin in England.

First Cement Factory of India

India entered into the Cement Era in 1914, when the Indian Cement Company Ltd. started manufacturing Cement in Porbundar in Gujarat. However, even before that a small cement factory was established in Madras in 1904 by a company named South India Industrial Ltd. Indian Cement Company Ltd produced only one type of cement which was designed by the British standard committee as "Artificial Portland Cement". This company marketed its product in Mumbai, Karachi, Madras and other parts and became a financial success.

At that time India had to import cement from England. The price of the imported cement was higher. Some other factors such as increase in domestic demand, reduction in supply from abroad (due to war), availability of Indian Capital, ample raw material, Cheap labour, support of the government etc. made it a leading industry in India in a short period of time.

- In January 1915, a cement unit was started at Katni in Madhya Pradesh
- In December 1916, another unit at Lakheri in Rajasthan was started.

During the First World War period, cement production in these three important factories was taken under control of the government and later the control was lifted once the war was over. After the war, 6 more units were launched in India.

In 1924, India's cement production was 267000 tons. However, initially this increased production could not reduce the imports and the industry suffered a rate war. This led to closure of many indigenous units. The Indian companies which were away from ports or commercial centres faced the lacational disadvantage.

The above incidents led to the industry stakeholder approach to the government for some kind of protection. The British government constituted a Tariff board , which recommended protection of the indigenous industry against the dumping of the imported cement. It recommended raising of the customs duty to 41% which was around 15% at that time, but this recommendation was not accepted by the government.

Key Other Landmarks in History of Cement

- In 1925, first association of the cement manufacturers was formed as "**Cement Manufacturers Association**".
- It was followed by "Concrete Association of India" in 1927.
- In 1930 "Cement Marketing Company of India" was started and this was followed by a quota system on the basis of installed capacity of the factories.
- In 1936, all the cement companies except one i.e. Sone valley Portland Cement Company agreed and formed **Associated Cement Companies Ltd. (ACC).**This was the most important even in the history of cement industry in India. Many more companies were established in the following years.
- Before partition India had 24 factories, out of which India retained 19 factories, which annual production of 2.1 million tons. Pakistan faced a problem at the supply side as it had problem of disposal of the cement produced and India faced a problem in demand side as production fell to 2.1 million tons from 2.7 million tons.
- After Independence, the partition of the country had a bad impact on the cement industry.

Cement Expansion Scheme

In 1948, the government adopted the **Cement Expansion Scheme** which envisaged new factories to increase the production. New factories were established at Bagalkot, Jaipur, Orissa, Travancore etc. In 1950-51, there were 22 operating units with an installed capacity of 3.3 million tons. Cement industry was given a great importance in all the initial five year plans. The target of the first five year plan was to raise the installed capacity to 5.4 million tons which was achieved. The industry has grown to manifold since then.

Cement industry: growth from control to free regime:

The foundation of cement industry in India was laid by India cement company Ltd. in the year 1912-13 at Porbundar (Gujarat State) and started production in 1914. The annual capacity of cement production then was 0.01 x 106 t. The production of cement gradually increased to 4.6 x 106 t/a, during the first five year plan (1951- 1956)1,2 of the Government of India. The price and distribution of cement, from 1 July 1956, came under the provisions of control order promulgated in the exercise of the powers conferred under section 18 (G) of the Industries Act 19512. The State Trading Corporation (STC) was established for the acquisition and distribution of cement. The main objective was to ensure that both the indigenously manufactured and the imported cement is sold at the same price. The STC was required to rationalize the movement of cement. The prices payable to cement producers were fixed on ex-works basis for naked cement. After adding the seller's commission, average freight, packing charges, excise duty and other charges, a uniform free-on-road (F.O.R) price was fixed, at which STC was required to sell the cement all over the country. The prices of the cement were revised time-to-time with regard to the basic factors viz. excise duty, freight and packing charges, in consultation with the various Government Departments. The price and distribution of cement continued in the controlled regime till 1977, when as a part of liberalization policy, the Government of India initiated gradual decontrol by giving 12% post tax return on net worth on new capacity creation, followed by partial decontrol in 1982. The controlled price did not reflect the economic cost. Thus continuous lower level of controlled prices acted as a disincentive for productivity which resulted in increasing shortages of cement. In order to improve the overall situation, the cement industry was finally put on the path of "free regime" by introducing total decontrol of price and distribution in March 1989. The cement industry registered a significant growth in the post decontrol period. The Table 11,2,3,4 gives the growth of installed capacity and production of cement for past five decades. As can be seen from the Table, the installed capacity of cement plants increased from 5.99 x 106 t/a in 1956 to 42.35 x 106 t/a in three decades i.e. till the year 1986. As a result of free regime, the installed capacity registered phenomenal growth in the last two decades. The annual installed capacity of nearly 118 x 106 t was added during 1986 to 2006

The Indian cement industry today employs the most modern manufacturing technology in terms of the unit operations. Some of the modern features of Indian cement manufacturing are given as follows:

- Computerised mine planning
- Efficient blending systems
- Energy efficient comminution (size reduction) processes namely vertical roller mills and roller press
- High efficiency air separators
- Improved dust collection systems employing fabric filters and electrostatic precipitators
- Suspension pre-heaters and pre-calciners
- High capacity kilns with improved heat transfer and low energy requirement
- High efficiency clinker coolers

- Energy efficient and less polluting materials handling systems
- Modern high capacity, electronically controlled bag/bulk packing and dispatch systems
- Moisture and seepage resistant cement packaging

The application of concrete in new (or less common) areas as well as the use of industrial wastes, such as FA or BFS, in concrete is increasing. The following areas appear to have great potential under Indian conditions: Concrete roads: The total length of roads in India, as in March 2002, was nearly 2.5 x 106 km. Out of those, nearly 58 % are surfaced roads. The share of cement concrete roads, within surfaced roads, is less than 2 %. According to one study conducted jointly by the Ministry of Rural Development and the Ministry of Commerce, Government of India, the life-cycle cost of concrete roads works out to be 5.7 % less than that of the bituminous roads, the higher initial investment notwithstanding. The use of concrete in road construction is increasing gradually. The Plate 1 shows a section of 95 km Mumbai-Pune expressway constructed in concrete recently. It is important to build the rural roads with concrete, considering the fact that they often remain neglected from the regular maintenance. The Plate 2 shows a typical rural road constructed in concrete. It will be worthwhile mentioning statistics in some Asian countries, for the sake of comparison. In Japan, nearly 10.5 % of the cement produced goes in the construction of roads and bridges, whereas in China the infrastructure sector, which includes roads, consumes about 40% of the cement. Thus there is a huge potential for the consumption of cement in road construction in India, provided the long-term superiority of concrete roads over bitumen roads is appreciated at all levels2

Conclusion

In India The first cement factory was installed in Tamil Nadu in 1904 by South India Industry Limited and then onwards a number of factories manufacturing cement were started. Our country is the fifth largest producer of cement in the world and is expected to become the second largest, after China, by the turn of the century. Cement is a key infrastructure industry. In our country, it has been decontrolled from price and distribution on 1st March, 1989 and de-licensed on July 25th, 1991. However, the performance of the industry and prices of cement are monitored regularly. India is the world's second largest producer of cement after China with industry capacity of over 200 Million Tonnes. With the boost given by the government to various infrastructure projects, road network and housing facilities, growth in the cement consumption is anticipated in the coming years. In order to meet the expanding demand, cement companies are fast developing new plants. The cement industry is poised to add 111 Million Tonnes of annual capacity by the end of 2009-2010, riding on the back of approximately 141 outstanding cement projects. 95% of the production is consumed domestically and only 5% is exported. Demand is growing at more than 10% per annum. More than 90% of production comes from large cement plants.

The Indian cement industry comprises of 132 large cement plants with an installed capacity of 148.28 Million Tonnes and more than 365 small cement manufacturing plants with an estimated capacity of 11.10 Million Tonnes per annum.

References

1. "Draeger: Guide for selection and use of filtering devices" (PDF). Draeger. 22 May 2020. Archived (PDF) from the original on 22 May 2020. Retrieved 22 May 2020.

2. Rodgers, Lucy (17 December 2018). "The massive CO2 emitter you may not know about". BBC News. Retrieved 17 December 2018.
3. "Making Concrete Change: Innovation in Low-carbon Cement and Concrete". Chatham House. 13 June 2018. Archived from the original on 19 December 2018. Retrieved 17 December 2018.
4. Hargreaves, David (March 2013). "The Global Cement Report 10th Edition" (PDF). International Cement Review. Archived (PDF) from the original on 26 November 2013.
5. Coal and Cement. World Coal Association Archived 8 August 2011 at the Wayback Machine
6. Concrete: the most destructive material on Earth The Guardian 31.8. 2019
7. "CO2 emissions by fuel, World, 2018".
8. "If the cement industry were a country, it would be the third largest emitter in the world". 13 September 2018.
9. Cement's basic molecular structure finally decoded (MIT, 2009) Archived 21 February 2013 at the Wayback Machine
10. "EPA Overview of Greenhouse Gases". 23 December 2015.
11. "The History of Concrete". Dept. of Materials Science and Engineering, University of Illinois, Urbana-Champaign. Archived from the original on 27 November 2012. Retrieved 8 January 2013.
12. Blezard, Robert G. (2004) "The History of Calcareous Cements" in Hewlett, Peter C., ed.. Lea's chemistry of cement and concrete. 4th ed. Amsterdam: Elsevier Butterworth-Heinemann. pp. 1–24. ISBN 9780080535418
13. Brabant, Malcolm (12 April 2011). Macedonians created cement three centuries before the Romans Archived 9 April 2019 at the Wayback Machine, BBC News.
14. Heracles to Alexander The Great: Treasures From The Royal Capital of Macedon, A Hellenic Kingdom in the Age of Democracy Archived 17 January 2012 at the Wayback Machine, Ashmolean Museum of Art and Archaeology, University of Oxford
15. Hill, Donald (1984). A History of Engineering in Classical and Medieval Times, Routledge, p. 106, ISBN 0415152917.
16. "History of cement". www.understanding-cement.com. Retrieved 17 December 2018.
17. Trendacosta, Katharine (18 December 2014). "How the Ancient Romans Made Better Concrete Than We Do Now". Gizmodo.
18. "How Natural Pozzolans Improve Concrete". Natural Pozzolan Association. Retrieved 7 April 2021.
19. Ridi, Francesca (April 2010). "Hydration of Cement: still a lot to be understood" (PDF). La Chimica & l'Industria (3): 110–117. Archived (PDF) from the original on 17 November 2015.
20. "Pure natural pozzolan cement" (PDF). Archived from the original on 18 October 2006. Retrieved 12 January 2009.. chamorro.com
21. Russo, Ralph (2006) "Aqueduct Architecture: Moving Water to the Masses in Ancient Rome" Archived 12 October 2008 at the Wayback Machine, in Math in the Beauty and Realization of Architecture, Vol. IV, Curriculum Units by Fellows of the Yale-New Haven Teachers Institute 1978–2012, Yale-New Haven Teachers Institute.
22. Cowan, Henry J. (1975). "An Historical Note on Concrete". Architectural Science Review. 18: 10–13. doi:10.1080/00038628.1975.9696342.
23. Sismondo, Sergio (2009). An Introduction to Science and Technology Studies Archived 10 May 2016 at the Wayback Machine. John Wiley and Sons, 2nd edition, p. 142. ISBN 978-1-4051-8765-7.

24. Mukerji, Chandra (2009). Impossible engineering: technology and territoriality on the Canal du Midi Archived 26 April 2016 at the Wayback Machine. Princeton University Press, p. 121, ISBN 978-0-691-14032-2.
25. Taves, Loren Sickels (Mar–Apr 1995). "Tabby Houses of the South Atlantic Seaboard" Archived 27 October 2015 at the Wayback Machine, Old-House Journal. Back cover.
26. Francis, A.J. (1977) The Cement Industry 1796–1914: A History, David & Charles. ISBN 0-7153-7386-2, Ch. 2.
27. "Who Discovered Cement". 12 September 2012. Archived from the original on 4 February 2013.
28. Znachko-Iavorskii; I. L. (1969). Egor Gerasimovich Chelidze, izobretatel′ tsementa. Sabchota Sakartvelo. Archived from the original on 1 February 2014.
29. "Lafarge History of Cement". Archived from the original on 2 February 2014.
30. Courland, Robert (2011). Concrete planet : the strange and fascinating story of the world's most common man-made material. Amherst, N.Y.: Prometheus Books. p. 190. ISBN 978-1616144814.
31. Francis, A.J. (1977) The Cement Industry 1796–1914: A History, David & Charles. ISBN 0-7153-7386-2, Ch. 5.
32. Hahn, Thomas F. and Kemp, Emory Leland (1994). Cement mills along the Potomac River. Morgantown, WV: West Virginia University Press. p. 16. ISBN 9781885907004