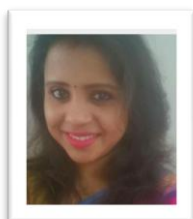


The Multi Aspects of the Stone Industry in India: A Critical Review

(With Special Reference to the Stone Industrial Units in Sarmathura in Dholpur, Rajasthan)



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Abstract

The impact of the industrial revolution can evidently be realized in India through its several flourishing industries that have ever since drawn the researchers and scientists associated with several fields. The stone industry is one of the most flourishing industries in India that adds a lot to the economic development of the country through the export of the stone inland and all over the world. It has raised several issues that need to be analysed, reanalyzed, answered and solved for the sake of the public welfare. Obviously, like the other industries, it too has its own merits and demerits. Positively speaking, it adds to the revenue of the government, generates employment in both the private and the public sector, and provides opportunities of investment to the capitalists and industrialists. Negatively speaking, it is horribly polluting the environment, causing adverse effects on the health associated with it, and forcing the male and female workers to work under unhygienic and adverse conditions. Despite all this, it is the demand of time to promote the stone industry in India.

Rajasthan in India is incredibly rich in its mineral resources. There are several places which are known for the manufacturing and export of stone. Some of them are Makrana, Jodhpur, Kishangarh, Dholpur etc. Several types of stone are manufactured in Rajasthan, such as, the sand stone, marble, kota stone, red stone etc. The research paper aims at presenting a critical review of the literature associated with the multi aspects of the stone industry in India.

Keywords: Crushing Units, Economic Development, Natural Resources, Pollutants, Revenue, Hub of Stone Business, Economic Factor.

Introduction

Rajasthan is a state located in the north western part of India with the population of 72, 307, 157. Geographically characterized by sand dunes, fertile plains, rocky undulating land and some forested regions, it covers largest area about 342,239 sq. km of the country. Rajasthan is the most pre-eminent sector of mines next to agriculture. It is a second largest mineral producer in India. The share of national production of non-metallic minerals is 24%. Thus, mining sector in Rajasthan is prominently revenue earner. Rajasthan produces 42 major and 28 minor minerals. This sector provides employment directly about 4 lakh workers and indirectly about 20 lakh workers. Rajasthan produces metallic and non-metallic minerals including renowned building stones and it also produces fuel minerals such as Lignite, Natural gas and Petroleum (Crude oil).

Rajasthan is the largest State in the country. The Aravali Range, running from northwest to southeast, divides the state diagonally into two distinct regions, the western arid region and the eastern semi-arid region. Over 61 percent of the State, mostly in the western part is desert. The State has only 1.1 percent of India's total water resources as against 10.5% of the country's geographical area and 5.5% of the country's population. Except for the Chambal, the 13 other rivers of the State are non-perennial. Precipitation is scanty, and constitutes the only source of annually renewable water supply. Rajasthan has vast mineral reserves of metallic and non-metallic minerals such as zinc, lead, copper, limestone, marble, granite, gypsum, and also lignite, petroleum and natural gas reserves. The State industrial policies have progressively sought to exploit these resources by promoting mining and mineral based industries. In the

industrial sector, the small-scale industries have shown significant growth which include primarily textile dyeing and printing, small mining leases, stone crushers, cement kilns, and agro-processing units.

According to (RSMM) Rajasthan State Mines and Minerals Limited (2014)¹ Rajasthan is richest in mineral resources of non-ferrous like copper, lead and zinc, mica. Mining has always been among the most hazardous of occupations and rapidly increasing demand for metal and minerals to meet the demand for growing infrastructure has greatly increased the importance of mining.

Rajasthan is the richest State in terms of availability and variety of minerals in the country. The State has 79 varieties of minerals, out of which 57 are being produced. Mining is a hazardous operation and consist of considerable environmental, health and safety risk to mine workers. Occupational Health and Safety to miners in mines in India is of a great concern in India. Safety is predominant in mining companies. It has been observed from the statistics on accidents and fatalities in mines that mine owner has not emphasized on the occupational health and there were no safety measures for mine workers and there is eminent need of an effective OHS policy.

Rajasthan is one of the most leading states in the stone industry. The stone of Rajasthan can be seen all over the world. The constantly increasing demand of the various types of stone in Rajasthan witnesses the invaluable contribution of the stone industry of Rajasthan to the State income and to the National income. Covering the various positive and the negative aspects, much has been explored and written about the stone industry of Rajasthan, still much is left to be explored and written. It is true that the stone industry is contributing to the national income of the country, but its negative effects cannot be avoided. Sharma (2007)² analyzed that the prominent places where mining is carried out for sand stone, marble and slate are Jodhpur, Makrana, Udaipur and Karauli. The stone industry as a whole can be discussed in the context of the several aspects associated with it. Some of them are- variety of stone found in Rajasthan, stone waste and its usage, environment, natural resources, child labour, occupational health and safety of the workers, management, economic equality, the owner-labourer relations etc.

Stone Waste & Its Usage

Ankit et al. (2013)³ explores that replacement of OPC cement with stone waste material provides maximum compressive strength. Ayesha et al. (2014)⁴ investigated the use of industrial waste in the production of unfired, environmental friendly bricks. Dharma et al. (2015)⁵ studied that the marble waste and different types of waste can be used as filling material. Halil et al. (2008)⁶ observed that the effect of 10-40% Cotton waste replacement in a CW- LPW (limestone powder waste) matrix does not exhibit a sudden brittle fracture. Husam et al. (2010)⁷ investigated that the Replacing of the pendant by marble sludge slime significantly reduces the shrinkage values of the produced tiles. Kamel K. et al. (2009)⁸ studied that the using of stone slurry sludge

as a source of water in concrete production has insignificant effect on compression strength, while it has a sharp effect on the slump values. Mamta et al. (2013)⁹ studied that use of stone waste (sludge) helps in environmental prevention and prevention of fertile land utilized in brick production. Mashaly et al. (2012)¹⁰ studied that the marble sludge is used in many products manufacture as replacement of different material. Nabil et al. (2015)¹¹ investigated that the compressive strength of the artificial stones is largely affected by the cement to stone powder percent, compaction pressure and curing time. Rajni et al. (2014)¹² studied that the stone waste can be utilized for developing low cost building materials such as block, brick, tiles etc. S. Dhanapandian et al. (2009)¹³ investigated that the presence of marble and granite wastes allows one to obtain a clay brick with better properties. Swaminathan et al. (2009)¹⁴ studied that granite and marble wastes can be incorporated up to 50 wt. % in clay materials for the production of bricks. Singh et al. (2015)¹⁵ finds that Finishing Material Marble Paste is better than a wall putty, and that it has more strength & cheaper. development of the nation. Viswakarma et al. (2013)¹⁶ studied that Marble slurry utilization in the black cotton soil is one of the best ways to improve soil properties and to protect the environment.

Impact of the Stone Industry on Environment

Environment has everything to do with the quality of life, but the stone industry has caused serious threats to the environment through the pollutants it produces. In their work Plant Ecology (Shukla & Chand 1993)¹⁷, discuss the contribution of the environment to the survival of man. In his book Ecology and Enviroment (P.D.Sharma, 1991-92)¹⁸ interprets environment as a complex whole of several factors acting, reacting and interacting with the organism. (R.S.Tripathi, S.B.Singh Parmer, 1996)¹⁹ calls environment 'reservoir of natural resources, while (Mary .B. Gregory, 1979)²⁰ discusses the environmental problems caused by the economic development. (Cilpin Aran, 1976)²¹ emphasizes the dust discharged by the stone crushing units which causes a condition which is hazardous to public health, safety or welfare of animals and plant life. K.A. Reddy (1990)²² generalizes that industries are responsible for the urban pollution in India. Hence, from the point of view of the environment, the stone industry is not good, as it horribly pollutes the air, water and peace of the environment.

Occupational Health and Safety of the Workers

According to Mehta (2002)²³, mining affects the wildlife, water balance, local climate & rainfall, sedimentation and depletion of forests and that the miners in mines are facing the health hazards arising out of pollution due to dust, gases, noise and polluted water. Saviour (2012)²⁴, finds that unscientific mining has caused degradation of land; mining operations cause deforestation, habitat destruction and biodiversity erosion and asthma, irritating the lungs and bronchial passages is caused due to concentration of dust deposits. Goswami (2013)²⁵, analyzed that the mining affects the whole eco system; a degraded environment closes the

employment opportunities and leads the poor people to criminal activities and that coal dust and Methane in the presence of a source of ignition creates the worst environmental hazard. According to Bamnia, Kapoor & Jain (2012)²⁶, industrialization is the major condition for the growth of a country but it has laden the environment with increasing effluents, pollution, levels of CO₂, global warming, depleting ozone layer, etc. According to Jha, Panwar, Khandelwal (2012)²⁷, Kishangarh, Rajasthan is the biggest market for marble cutting and selling. Mining and over exploration and exploitation of water has deteriorated the quality and quantity of the water level and that nowadays mining is posing threat to the eco-environment system. According to Gupta (2008)²⁸, the major occupational diseases which are prevalent are silicosis, pneumoconiosis, pesticide poisoning, noise induced hearing loss, chemical and machinery accidents and that lack of staff in concerned departments is the reason of all this.

According to Mehta, Mehta (2015)²⁹, large number of labourers are dependent on marble industries for their survival, and there are many problems associated with marble industry like ecological, environmental, sociological and pollutant hazard of the waste generated in mining. According to Agnihotram (2005)³⁰, workers are more likely to be affected by the danger of the high technology. Most of the industrial laws in India are only in papers not in reality. According to Pandita (2009)³¹, unsafe working conditions are the top most reason for the deaths and disabilities amongst the Indian workers and around 4 lakhs people die every year due to work related problems. According to Bainara and Arya (2013)³², silica dust exposure is recognized for the development of systemic sclerosis. It has been analyzed in a case of manual stone cutter which exposes silica dust since last 17 years and not diagnosed silicosis but found Scleroderma, feature of systemic sclerosis. Diagnosis of silica associated systemic sclerosis on the basis of detailed clinic-radiologically and immunologically.

Child Labour

The National Commission on Labour (1969)³³ reveals in its report on child labour that employment of children is almost non-existent in organised industries and that it persists in varying degrees in the unorganized sector. Khandekar, Mandakini and R.D.Naik (1972)³⁴ in their study indicate in India children have a restricted choice while getting a job in an organised sector because of enforcement of legislative measures. S.M.Pandey (1975)³⁵ has concluded in his study that the child labour is observed to the higher in areas which are economically backward and which, therefore, have higher incidence of rural poverty. A survey (1979)³⁶ of child labour in Delhi (ICCW) projects that most of the children joined the labour force by the age of 10 years. Nirmal Sawhney (1979)³⁷ concludes that most of the child labourers are illiterate and from joint families. V.C.Baskaran (1980)³⁸ conducted a sample survey in Bombay and Delhi and generalizes that 40 to 45 percent of the slum children do not attend school and are employed as rag pickers, tea shop

assistants, shoe shine boys and they do not get any nourishing food. According to a Medical Survey³⁹ most of the working children in the slate pencil mines of Mandsaur district of Madhya Pradesh are victims of silicosis, caused by the inhalation of the flying dust emitted by the electric saw while cutting slate pencils. Chandra Kanta Sharma and Raj Singh (1982)⁴⁰ in a study of 100 child labourers in Hissar town of Haryana reveals that the factors responsible for the child labour are acute poverty, caste, family size and literacy levels. The Workshop on Woman and Child Workers in organized sector (1983)⁴¹ held at New Delhi concludes that there is direct exploitation of the child workers in terms of very low wages, long hours of work, unhygienic conditions and sexual exploitation. According to a study conducted by Neera Burra (1986)⁴² on child labour in the glass industry at Ferozbad, there are almost, 50,000 children below the age of 14 years working in the glass industry at Ferozbad. MahavirJain (1990)⁴³ generalizes that children are forced to work in the stone quarries under absolutely hazardous and inhuman conditions. They suffer from several physical ailments, medical facilities and civic amenities are beyond their reach.

Objectives of the Study

1. To have an idea of the Indian stone industry from the research point of view
2. To learn about the advantages and disadvantages of the stone industry; to be familiar with the various types of stone manufactured in India; to be familiar with the contribution of the stone industry to the national income; and to observe, study and interpret the stone industry in India through the study of the various reviews already made from time-to-time by the various researchers, and through the observation of the stone industrial units in Sarmathura
3. To classify the selected reviews associating with the various aspects of the stone industry; to explore through them the advantageous and the disadvantageous aspects of the stone industry
4. To visit, observe and interpret the quarries in Sarmathura in the district and the conditions under which the workers work therein for the sake of the evaluation of the reviews; to visit the various stone industrial units in Sarmathura, and to observe the owner-labourer relations therein; to observe and study the presence of the women and children as workers in the stone industrial units in Sarmathura; to study and observe the various aspects associated with the flourishing stone industry in Sarmathura
5. To explore the various causes of the stone industry and its effects on the surroundings through the observation of the stone industrial units in Sarmathura, and to make the interpretation of the causes and effects of the stone industry.

Review of Literature

According to Ahmad (2015)⁴⁴, the quarrying and crushing are carried out in many parts of India and majority of stone mines are unorganized. He is bold enough to generalize that sandstone mining leads to Silicosis, TB and body pain and

musculoskeletal disorder. Gramin Vikas Vigyan Samiti (2010)⁴⁵ report says that the total miners in Rajasthan 37% are women miners. Female workers are paid less than male workers. Almost every woman in miners is employed as unskilled and irregular labour. Obviously, now the number of the women miners must have increased horribly with the passage of time and with the lapse of so many years. According to Sprio (2010)⁴⁶, workplace accidents can be reduced by educating employees. According to Mehta, Mehta (2015)⁴⁷, large number of labourers are dependent on marble industries for their survival, but there are many problems associated with marble industry like ecological, environmental, sociological and pollutant hazard of the waste generated in mining. According to International Council on Mining and Metals (ICMM) (2012)⁴⁸, legislation must provide effective level of protection to workers working in hazardous environment. Health and safety is the essential responsibility of the employer. According to Sriraman (2012)⁴⁹, there is an utmost need of some department of government of India dealing with matters of occupational health and safety and of an apex body. Muthuviknesh & Kumar (2014)⁵⁰, occupational health and safety is important due to moral, legal and financial reasons. It must be the duty of the organization to care of the employees.

Hypothesis

1. The stone industry is one of the most leading industries in India
2. There are several aspects associated with the stone industry in India that need to be studied for the sake of providing a safe and clean environment to the inhabitants of the places where such industries are running
3. The stone industry in India provides employment to millions of male and female workers
4. The presence of the child labourers is witnessed at the various stone industrial units, in the stone mines and quarries
5. The working conditions of the labourers engaged in the stone mines and industrial units are too miserable
6. Everyday metric tons of stone is exported to the various countries of the world
7. Day-by-day the demand for the stone is increasing for several purposes
8. It is making a tremendous contribution to the revenue of the government
9. The plenty of the stone mines and quarries, profit, availability of the labourers, possibility of the enhancement of the stone industry are the main causes of the stone industry in India
10. The effects of the stone industry on the surrounding environment are too drastic
11. The stone industry is responsible for the various forms of pollution, and causes several diseases in the people who are engaged in the industry or who live in the surrounding area

Research Methodology

Based on the reviews on the multi-aspects of the stone industry in India, and solely on the secondary data, the paper is a critical study and analysis of the multi-aspects of the stone industry in

India. For the purpose, the researcher made a thorough study of some of the selected reviews, and then, after classifying them in accordance with the aspects of the stone industry they belong to, he analysed and reanalyzed them. For the sake of keeping up the scientific spirit of the work, he made personal visits to the various stone industrial units, stone mines and quarries in Sarmathura in the Dholpur district. All this helped him not only study the causes and effects of the stone industry, but also make generalizations about the various aspects of the stone industry.

Key Findings & Suggestions

1. The Indian Stone Industry is both advantageous and harmful. There are reviews that highlight the positive aspects of the stone industry, but at the same time, there are the reviews that focus the various negative aspects of the industry.
2. It provides employment to millions of males and females all over India. At the same time, it witnesses the physical, mental and circumstantial exploitation of the male, female and child labourers engaged in it.
3. It covers various states in India, but Rajasthan is the most popular state known for the stone industrial units, stone mines and quarrying centres.
4. From the point of view of the revenue, it is very profitable, but from the point of view of public health and environmental pollution, it is too harmful.
5. It is paving a path for globalization through import and export between the various nations.
6. Granite, Kota Stone, Sand stone, slate etc. are some of the popular stone that are in great demand.
7. After the manufacturing of the stone, the waste stone is used for several other purposes.
8. The process of quarrying and manufacturing of the stone throws several poisonous gases in the environment as a result of which the environment gets polluted.
9. For the sake of the check of the environmental pollution, it is essential for the government to make such a policy in the matter that can ensure public health, clean and unpolluted environment and the flourishing of the stone industry.
10. The labourers should be paid proper wages; the woman labourers should be provided and guaranteed all the benefits meant for them, and child labour should be banned.

Conclusion

The critical review of literature on the stone industry reveals that at present it is the most profitable industry which has a tremendous role to play in the national income of the country, economic upliftment of the people engaged in it as industrialists or workers, exports etc. However, its negative effects on environment and health of the workers cannot be ignored. In a word, some middle path needs to be discovered for its successful existence. The government policies, laws, and of course, public awareness can be helpful in this regard. Apart from the measures taken by the government in this regard,

the serious concern of the industrialists, local people, and NGOs is also required. If we want the stone industry of Rajasthan to be flourished successfully in the interest of the state and nation, it should be maintained and continued in a way that it does not make the environment harmful and it ensures the health of the various people associated with it.

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