

SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACT OF STONE CRUSHING INDUSTRY IN VILLUPURAM DISTRICT OF TAMILNADU

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Abstract

In India, among the small scale industries, stone crushing industry plays an important role as it has an influence in fulfilling the shelter need of people by providing crushed stones for roofing of buildings. This industry has its merit by providing basic raw material for various infrastructure developments including paving roads, constructing bridges and canal establishment. Apart from this, it is also used in the manufacturing of cement based products like RCC pipes, PSC poles, pre-moulded slabs, frames and beams for fabrication. It is quite amazing to note that there are around 12000 units available in our country and is considered as an economy boosting sector with an annual turnover of Rs.5000 crores. Over 500000 individuals are employed in this business that includes workers and entrepreneurs. The working category is engaged for carrying out works in mining, crushing plant, transportation of mined stone and crushed products. This industry infuses social upliftment and significant economic improvement to the rural poor as it provides employment opportunities. There is a concern that although it improves the society both socially and economically, the occupational environment at the stone crushing sites passes a notable health hazard to the workers, since inhalation of particles such as silica over a long period of time may cause silicosis. Respiratory damage resulting from such exposures can range from reversible functional changes to irreversible damage to the lungs and in some extreme exposures, causes lung cancer. Hence, steps should be taken to mitigate the entire environmental hazard and to run the industry eco friendly a socio-economically profitable one. The present study was conducted in six taluks of Villupuram district. In each taluk, 10 per cent of stone crushing units have been selected. From each unit, 4 workers are selected for constituting the sample size of 120 workers. The study focuses on the socio-economic and health problems of the workers due to polluted environment.

Key words: Stone crushing industry, employee welfare, environmental pollution, sustainable environment, etc.

1. Introduction

In a developing country like India, any activity involving less capital investment having potential to provide work to the idle hands deserves exploitation to the fullest extent. A glance of the vast scope for development and varied uses of products of stone industry will confirm this view. Indian people in rural areas mainly depend on agriculture but it provides employment only for a period of four to five months in a year. During the remaining months, they are unemployed. The stone crushing industry provides additional alternative or subsidiary occupation to the agriculturists. Through this industry, thousands of village artisans earn their daily livelihood by producing varied items viz., stoneware, monuments, stone pillars, slabs, rubble, metal for road, etc. In the first Five Year Plan, it was observed that small scale industries are essential to provide subsidiary or alternative occupation and to utilize local raw materials or cater to the local markets. Construction

of building and roads has a significant to make towards economic and social growth in Indian condition. It is not only in terms of development of infrastructure but more important in the matter of employment promotion.

2. Review of literature

Krishnendu Mukhopadhyaya, et al. (2011) stated that stone crushing unit workers suffer from particulate matters and respirable silica at work and in their residents nearby. The study was undertaken to evaluate the area and personal exposure concentration of respirable particulate matters and silica in workplace and in surrounding villages. An innovative dust abatement dry engineering control system was installed as a pilot work to reduce dust emission from the unit and the results afterward were found to be encouraging.

Dulal Chandra Saha and Pratap Kumar Padhy (2011) found that trees must be planted around industries and along roadsides to absorb pollutants in air including particulate matter so as to reduce air pollution. Although trees possess some stress-tolerant mechanisms within them, considerable amount of damage is caused to them which are evident by showing physical damage of leaves as a result of dust deposition, inhibition of photosynthetic activities and protein synthesis as well as susceptibility to injuries caused by microorganisms and insects. Some species are thriving with hardship in the polluted environment. There is a spatial influence on effects of pollutants observed. They concluded that some regulation like implementation of dust containment and suppression measures must be imparted.

Ramana and Srinivasa Rao (2011) studied the management of stone crushing industry and its impact on employees and environment. It is one of the informal sectors which possible to establish at lower cost of production and contribute significantly in extend infrastructure, but it has the criticism as polluting the environment. Low income, ill health, etc. are common problems of the workers of stone crushing units.

Madeleine Jenkins, (2012) studied water, sanitation and human rights for stone quarry communities. He has stated that the stone quarry communities settled near stone crushing units do not have adequate access to clean, safe and reliable drinking water provisions nor do they have adequate sanitation.

Narkhede Vinod, et al. (2012) stated that workers in the stone crushing industry are exposed to stone dust which leads to various morbidities especially muculo-skeletal problems and respiratory problems. The respiratory problems are significantly associated with duration of exposure and decreased PEFr.

Nwibol, et al. (2012) stated that chronic exposure to dust due to stone quarrying may increase the risk of respiratory problems and impaired lung function cigarette smokers are at higher risk.

Ravindran (2013) stated that the concept of having a clean environment for the industry is essential. Rocks are broken into small pieces, in a stone crusher. Crushing of boulders lead to production of large quantity of dust, which tends to float in air and spread in the vicinity of the stone crusher. He concluded that inhalation of fine dust is dangerous to health.

3. Objectives of the study

1. To identify social problems found in stone crushing units of Villupuram district
2. To delineate the economic impact of the industry to the livelihood of the workers.
3. To understand the environmental impact on workers due to stone crushing industry.
4. To offer suitable suggestions based on the findings of the study.

4. Hypothesis of the study

Following null hypothesis has been formulated and tested.

H₀₁: There is no significant relationship between the educational level of the owners and the facilities provided to workers.

H₀₂: There is no significant relationship between the amount invested in the business and the facilities provided to workers.

5. Methodology

This study is based on both primary data and secondary data. The primary data were collected from owners and workers of stone crushing units in the Villupuram district by using interview schedule. The secondary data were collected with the help of books, research papers, magazines, news papers, journals, and internet so on. There are six taluks in Villupuram district. In each taluk 10 per cent of stone crushing units have been selected. From each unit, 4 workers are selected for constituting the sample size of 120 workers. The samples are selected at randomly with help of various units operating in the Villupuram district. The sampling design is given in the following table.

TABLE 1

Sampling Design

Name of the Taluk	Total Units	Sampling Units	Workers
Gingee	40	4	16
Tindivanam	80	8	32
Vanur	60	6	24
Ulundurpet	50	5	20
Kallakurichi	40	4	16
Thirukoilur	30	3	12
Total	300	30	120

Source: Primary data

6. Analysis and Interpretations

TABLE 2

Educational Level and Facilities Provided to Workers

Educational Level	Yes	No	Total
Middle school level	6 (75%)	2 (25%)	8
High school level	3 (75%)	1 (25%)	4
Higher secondary school level	8 (80%)	2 (20%)	10
Under graduation	4 (100%)	0 (0%)	4
Post graduation	2 (50%)	2 (50%)	4
Total	23	7	30

Source: Primary data

Calculated χ^2 value	Table value At 5% Level	DF	Result
2.8882	9.488	4	Not Significant

From the above table, it is clear that out of the sample respondents, the majority of 23 respondents had received the facilities from the owners. The remaining 7 respondents had not received any provisions from the owners. The calculated chi-square value (2.8882) is less than the table value (9.488) and the result is not significant at 5% level. Hence, the hypothesis “there is no significant relationship between education of the sample owners and provision of facilities to workers” holds good. Thus, there is no close relationship between educational level of the owners and the facilities provided to workers.

TABLE 3**Investment and Provision of Facilities to Workers**

Investment	Yes	No	Total
Low investment	6 (85.29%)	1 (14.71%)	7
Large investment	17 (73.04%)	6 (26.96%)	23
Total	23	7	30

Calculated χ^2 value	Table value 5%	Degree of freedom	Remarks
0.417808	3.841	1	Not Significant

It is evident from Table 4 that the majority of the respondents reported that large investment business provides benefits to workers. In low investment business, majority of the respondents reported that they were not provided any provisions. The calculated chi-square value (0.417808) is less than the table value (3.841) and the result is not significant at 5% level. Hence, the hypothesis “there is no significant relationship between investment of the sample owners and provision of facilities to workers” holds good. There is no close relationship between investment of the owners and provision of facilities to workers.

TABLE 4**Health Hazard of the Respondents Due To Work**

Health Hazard	No. of Respondents	Percentage
Yes	120	100
No	0	00
Total	120	100

Source: Primary data

Table 4 shows that all the workers are affected due to the dust, pollution or noise. Thus, it is concluded that all the workers are having at least one health problem due to pollution.

TABLE 5**Illness Suffered by the Respondents**

Type of Illness	No. of Respondents	Percentage
Respiratory problems	79	65.83
Hearing problems	25	20.83
Sight/vision problems	14	11.67
Skin and their problems	2	1.67
Total	120	100

Source: Primary data

Out of 120 respondents 65.83 per cent of respondents were having respiratory problem, while 20.83 per cent of the respondents were affected by hearing problem. 11.67 per cent of the respondents were having problems in their sight/vision. The remaining 1.67 per cent of the respondents was suffered by skin and other diseases. Therefore, most of the workers are affected by lungs related problems followed by the hearing and sight problems..

7. Findings

1. 37.5 per cent of the respondents belong to the age group of 40-50 years while 4.16 per cent of the respondents are in the age group of above 50 years.
2. 33.34 per cent of the respondents have elementary education. About 12.50 per cent of the owner's were uneducated.
3. In regards daily wages, 1.67 per cent of the respondents receive below Rs.150 per day, 40.83 per cent of the respondents receive Rs.151- 300 per day, 51.67 per cent of the respondents receive Rs.301-450 per day, and 5.83 per cent of the respondents receive above Rs.450 per day. 65 per cent of the workers received extra facilities other than wages from the owners while 35 per cent of the have not received any extra facilities.
4. The majority of the respondents have received bonus while only 0.83 per cent of them were getting some other extra benefits.
5. All the workers are suffering with health problems at the working place due to pollution.
6. Out of 120 respondents, 65.83 per cent of the respondents were having respiratory problems, 20.83 per cent of the respondents were having hearing problems, 11.67 per cent of the respondents were having sight problems and 1.67 per cent of the respondents were suffered by skin and other diseases.
7. The problems faced by the stone crushing workers are: inadequate wages, temporary job, heavy work, less government encouragement, illness and climate.

8. Suggestions

1. The government should make arrangements for the proper implementation of the revised minimum wages to the workers of the stone crushing units.
2. In order to raise their total income, the commercial banks may provide the workers with loans with low rate of interest for animal husbandry, poultry farming, and sheep rearing and so on.
3. There is no adequate medical facility for taking treatment. So the workers may be provided by owners with protective devices like, face mask, gloves, and shoes.

4. The stone crushing manufacturer should employ the workers on a permanent basis and encourage them to work regularly by giving some incentives. The owners should procure enough explosives and blasting materials in large quantities and make them available to the workers.

9. Conclusion

The study concludes that there are some social and economic problems prevailing in the stone crushing units. If suggestions are properly carried out it should root out the problems. The owners of the crushing units should provide amenable facilities to provide pleasant atmosphere and safeguard the workers' health.

10. Reference

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