

IMPACT OF CEMENT FACTORY OPERATIONS ON RESIDENTS: A CASE STUDY OF BOMMANABUDNI VILLAGE OF BAGALKOT DISTRICT, KARNATAKA STATE.

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Abstract

Cement industries is one of the oldest and most significant industries in Indian economy as it provides the basic building material. However, it like other industries has its major share in environmental pollution. The particulate matters of the dust exhausted from the cement plants when released to the air create considerable pollution. As such, various stages of cement manufacturing have their own negative impact on environment. It is common to observe that the neighbouring communities are suffering from respiratory problems, skin infections and eye irritation etc. Hence there is need to address the problem of cement dust and to create awareness among the neighbouring communities. Thus the present study makes an attempt to assess the impact of cement dust exposer on residents of Bommanabudni village where the cement factory is located. To collect information a questionnaire based survey was conducted in the village and the data was analysed with help of simple statistical method like percentages. An effort is made to suggest some measures to safeguard the health cement dust exposed communities.

Keywords: Cement dust, Pollution, Respiratory problem, Dust exposure, Community.

Introduction

Cement production is mainly concerned with dusty operation as it involves several hot dry powders. All these operation emit greenhouse gasses into surrounding which are the major causes of health hazards. Cement manufacture causes environmental impacts at all stages of its production. These include emission of air borne pollutants in the form of dust, gasses, noise, and vibration when operating machinery and during blasting in quarries (Merenu IA, Mojiminiyi FBO, Omokhodion F, Ibrahim MTO, 2015). Several studies have demonstrated linkage between cement dust exposer, chronic impairment of lung function and respiratory symptoms in human population. The cement dust irritates the skin, the mucous membrane of the eyes and respiratory system. Its deposition in the respiratory tract causes a basic reaction leading to increase in the pH values that irritates the exposed mucous membranes (Zelegeet al.2010). Although, many laws were enacted by Indian government to regulate the cement manufacturing units, plant operators are exploiting the deficiency in the monitoring of environmental performance. Thus, the neighbouring communities are becoming victims for the negative impacts of cement manufacturing.

Methodology

The present study encompasses empirical investigation, observation and interview of respondents of the study space for the assessment of impact of cement dust exposer on host communities. Thus, primary and secondary information sources additionally as

intelligence operation survey were utilized for the analysis. The first supply consists of thirty two (32) structured questionnaires that were administered on the respondents of the realm; the forms were administered on a scientific sampling technique.

Objectives

The aim of this paper will be achieved with the following objectives: To study the present scenario of Bommanabudni and the cement industry which is adjacent to the village. To examine the effect of the industrial dust on the day to day life and health of the nearby community

Study area

The Bommanabudni village is located in Mudhol taluk of Bagalkot district. Bommanabudni village has 105 households and total population of this village is 513. In the year 2005 JK Company established a cement industry at Muddhapura of Mudhol Taluk near Bommanabudni. The cement plant is located at the distance of only 500 to 600 metres from village. The district of Bagalkot is situated entirely on the North Karnataka Plateau, which is part of the larger Deccan Plateau. Located in north-central Karnataka, Bagalkot is surrounded by Belgaum District to the west, Bijapur District and Kalburgi District to the north and north-east, Raichur District to the east and Koppal District, Gadag District and Dharwad District to the south-east, south and south-west respectively.

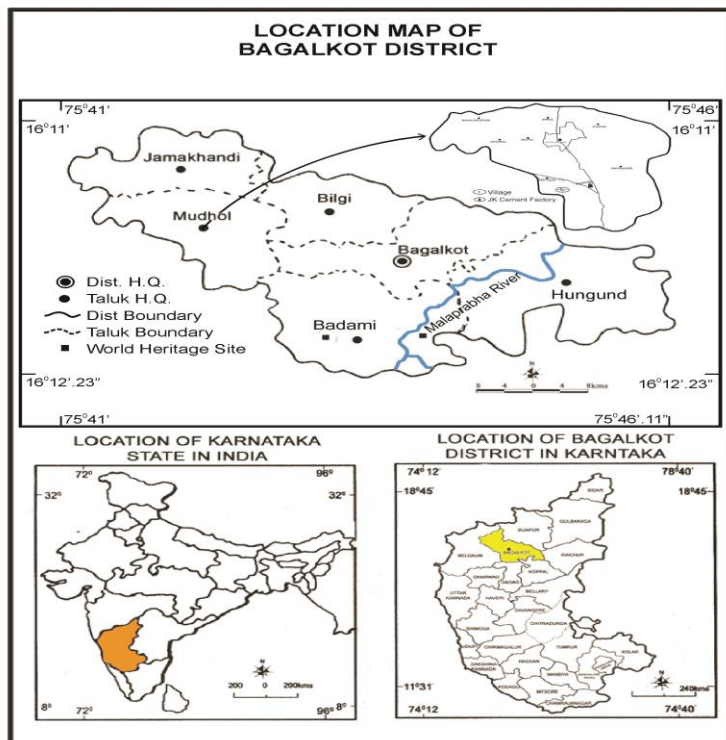


Fig. 1

Figure 1. Location Map.

It is positioned at 16°12'N 75°45'E and covers an area of 6593 km². Bagalkot district has six taluks- Bagalkot, Badami, Hunagunda, Mudhol, Jamkhandi, Bilgi. According to the 2011 census Bagalkot district has a population of 18,90,826, the district has a population density of 288 inhabitants per square kilometre. There are six cement industries in Bagalkot district which are located at various places such as Mudhol, Lokapur, and Bagalkot. The data recorded on various characteristics has been analysed statically. As the study is interested in the environmental impact of cement industry on respondents near Bommanabundndni village, Mudhol Taluk of Bagalkot District, Karnataka state.

Ages of the respondents

While conducting a survey of respondents in the village where cement dust affecting regularly, we made an attempt to know the age of respondents. More than 47 % respondents belong to group of 30 to 45 years. 28% respondents are of 45 to 60 ages, and 19 % respondents are below 30 years age and lastly 6.25 % respondents are senior citizens who have crossed 60 year. Thus, half of the respondents belong to the age group of 30-45 years. (Table 1 and fig 2)

Table 1. Ages of the respondents

Ages	Below 30	30 to 45	45 to 60	Above	Total
No. of Respondents	6	15	9	2	32
Percentage	19	47	28	6	100

Education level of respondents

We made an effort to know the education level of residents of the village. 37.5% of the residents have schooling up to SSLC. 31% of the respondents are illiterate, 19% respondents went up to primary and 13% respondents went up to college education also. The following table makes it clear that one third of the villagers are still illiterate and nobody of the village has degree education (Table 2 and fig 3)

Table 2. Education level of respondents

Education level	Illiterate	Primary	SSLC	PUC	Total
No. of Respondents	10	06	12	4	32
Percentage	31.25	18.75	37.5	12.5	100

Occupation of the respondents

Obviously all respondents of the village are depending on agriculture. So most of respondents are working either in their own agricultural land or working as coolie, and some are working in cement industry. Table.3 and fig.4 show that 69% of respondents are involving in agriculture, 22% respondents are working as coolie and 9.37 % of respondents are working as labourers in cement factory.

Table 3: Occupation of the respondents

Occupation	Cooli	Agriculture	Industrial Worker	Total
No. of Respondents	7	22	3	32
Percentage	21.87	68.75	9.37	100

Monthly income of respondents

Residents of the village said that they are facing a lot of problems from cement dust which effecting on agriculture crop. Due to dust, yield of the crops is decreasing year by year. 32.2 % of respondents monthly income of the family is only from Rs 1500-3000 and 45 % respondents' income is Rs 3000 to 4500 per month. Thus, 22.4 % of respondents' income is above 4500 rupees. (Table 4 and fig 5)

Table 4. Monthly incomes of respondents

Income	Rs 1500-3000	Rs 3000-4500	Above Rs 4500	Total
No of Respondents	10	15	7	32
Percentage	32.2	44.8	22.4	100

Ownership of the house

Basically Bommanabudni is a small village; it is located in agriculture area. So we cannot find out any rented house in village, all respondents have their own house in that village. All respondents (32) i.e. 100% respondents have their own house.

High frequency of sweeping the house

When we asked about the effect of cement dust, respondents showed their own houses to us. It was common to observe the cement dust which falls regularly on houses. They said that they are sweeping the house 4 to 5 times per a day. In those respondents, 75% of respondents strongly agree to this point and 25% of respondents agree that the dust is falling on their houses. (Table 5 and fig 6)

Table 5. High frequency of sweeping the house

Opinion	Agree	Strongly Agree	Total
No. of Respondents	8	24	32
Percentage	25	75	100

Necessity of closed almirah to keep the utensils and other essential things tidy

Although most of respondents agree that they require closed almirah to keep utensils and every item in room as cement dirt falls on dishes and on vegetable. But 84 % of respondents strongly agree and 16 % of respondents are also agreed that they require almirah to their house. (Table 6 and fig 7)

Table 6: Necessity of closed almirah to keep the utensils and other essential things tidy

Opinion	Agree	Strongly Agree	Total
No. of Respondents	05	27	32
Percentage	15.62	84.37	100

Difficulty in draying process of the cloths

From the factory, Cement mud falls on wet garments, thus cloths usually take longer duration in drying and cloths become dirty from the mud. 81.25 % of the respondents of the study area powerfully agree and 19 % of them also agreed that they are suffering from the difficulty in drying the cloths. (Table 7 and fig 8)

Table 7. Difficulty in drying process of the cloths

Opinion	Agree	Strongly Agree	Total
No. of Respondents	6	26	32
Percentage	18.75	81.25	100

Adverse effect on durability of cloths

When we asked the respondents whether durability of clothes has been affected from cement dust? They told that when cloths are in drying process dust fall on them as cement dust fall normally on all places in village. Cement dust has chemicals, so these chemicals react with wet cloths. For this reason durability of clothes has been decreasing. Out of total respondents 91% strongly agree this point and 9 % respondents also agreed this fact. Thus, all villagers are facing the problem of falling dust which is not only hazardous to health but also for the strength of clothes they wear. (Table 8 and fig 9)

Table 8: Adverse impact on durability of cloths

Opinion	Agree	Strongly Agree	Total
No. of Respondents	03	29	32
Percentage	9.37	90.62	100

Difficulty in washing due to polluted water

All 32 respondents said that washing has also become one the difficult tasks as Water polluted by dust and about 96.87 percentages of them agreed that pollution from cement factory making the washing process very difficult, and the consumption of soap has been increased due to the dust emitted by the cement factory in the study region. All 32 respondents opined soap consumption for cleaning clothes and vessels is accelerated (Table 9 fig 10)

Table 9. Difficulty in washing due to polluted water

Opinion	Agree	Strongly Agree	Total
No. of Respondents	01	31	32
Percentage	3.12	96.87	100

Drinking water is being affected by dust emission

Table 10 shows that 90.62 % of the respondents accepted the fact drinking water is heavily impure. It clearly shows that unsafe drinking water causing health problems. The bulk of respondents alleged that pollution from the cement industry makes water generated in the study region unsafe for drinking as a result of pollution in surroundings. (Fig 11)

Table 10: Drinking Water Is Being Affected By Dust Emission

Opinion	Agree	Strongly Agree	Total
No. of Respondents	03	29	32
Percentage	9.37	90.62	100

Increased expenditure on maintenance

Table 11. Increased expenditure on maintenance

Opinion	Agree	Strongly Agree	Total
No. of Respondents	6	26	32
Percentage	18.75	81.25	100

Construction of house at far off places from the cement factory

Table 12 shows that 53.12 % respondents have the opinion that their residence should be constructed at a far off place from cement industry, 46.87% respondents agreed with it strongly that, their residence should be far away from industry. This shows that villagers are conscious about the healthy life.

Table 12. Construction of house at far off places from the cement factory

Opinion	Agree	Strongly Agree	Total
No. of Respondents	17	15	32
Percentage	53.12	46.87	100

Increased expenses on conveyance

Table 13 shows that the conveyance expenses have been increased as their Houses are constructed at far off places from the industry. In residents 40.62 % of the respondents agreed have the opinion that their expensive is increase on conveyance and 59.37% respondents agreed with it strongly that to question. (Fig 14)

Table 13. Increased expenses on conveyance

Opinion	Agree	Strongly Agree	Total
No. of Respondents	19	13	32
Percentage	59.37	40.62	100

Table 14. Exposure to chemicals frequent

Opinion	Agree	Strongly Agree	Total
No. of Respondents	27	5	32
Percentage	84.37	15.62	100

Exposure to chemicals

Now days it is not possible to live in a chemical-free world on the earth, Chemicals are found all around us .Some gasses like oxygen and hydrogen are essential components for living creatures including man. However, some other chemicals are harmful to our earth. We made an effort to collect information regarding this 84.37% of the respondents agreed that the exposure to industrial chemicals is affecting human health. And 15.62 % respondents strongly agreed that there is unhealthy environment in the study area. (Table 15).On the

basis above table we can conclude that there is need to check unnecessary environmental chemical contamination in order to improve and sustain the health, well-being and quality life of the villagers.

Nature of the disease

Respondents of neighbouring communities showed high levels of respiratory, skin infections, eye irritation, gas trouble, and children are commonly suffering from such disease. Here made an attempt to know the diseases suffered by the villagers 46.87 % of the respondents having more than 3 deceases and 46.87 % of them are having more than two diseases.(Table 15 and fig 16)

Table 15. Nature of the disease

No of disease	1 Disease	2 Disease	3 Disease	More than 3 Disease	Total
No. of Respondents	0	2	15	15	32
Percentage	0	6.25	46.87	46.87	100

Frequency of hospital visit

Table 16 shows that because of illness respondents are frequently visiting hospital.31.25 % of them are visiting once in two weeks .53.12 % of the respondents said that they are visiting hospital once in a month. And 15.62 % of them are going to hospital frequently. Thus, medical expenditure of the villagers increasing.

Table 16. Frequency of hospital visit

Duration	Weekly	Once In 15 Days	Monthly	Total
No. of Respondents	5	10	17	32
Percentage	15.62	31.25	53.12	100

Table 17 Children health problem

Opinion	Yes	No	Total
No. of Respondents	28	4	32
Percentage	87.5	12.5	100

Table 18. Decreased working capacity

Opinion	Agree	Strongly Agree	Total
No. of Respondents	2	30	32
Percentage	6.25	93.75	100

Children health problem

In that village children are commonly suffering from various diseases for the reason of cement dust. Table 17 shows that 87.25 % of respondents' opined that children are suffering from health problems. 12.25% of them rejected the idea that there is health problem to their children due to cement dust.

Table 19 Lack of peaceful atmosphere at house

Opinion	Agree	Strongly Agree	Total
No. of Respondents	2	30	32
Percentage	6.25	93.75	100

Result

Greenhouse gases are emitted to atmosphere from cement industries. It was noticed while conducting the survey that in the very study region cement mud was harmful for vegetation, damaged the growth of plants etc. As per respondents responses there is certain and clear cut relation between the diseases and dirt pollutant. Questionnaire study indicates that among the respondents, 46.87% people stricken by quite 3 diseases like asthma, cough wheezy, eye irritation, skin allergies and that they strongly consider this because of the mud. During the investigation, it was observed that expenditure of the villagers increased because of the mud in the study space it resulted into increased consumption of soap, laundry garments, etc.

Conclusion

From the above study, it is clear that cement dust and other air pollutants contributed by cement factory causes pollution and ultimately it effects on the human health. Respondents were worse affected as a result of they lacked safety information and access to protecting instrumentation, and didn't have free medical aid. There is a need to enforce stringent environmental laws. Cement factories must be strictly warned to establish more effective dust emission control equipment to check the level of cement dust emission into the surrounding Communities which may be observed to be suffering from cement dust exposure of have to be resettled aloof from the cement plant. Various operations of cement production which not only affecting staff but also the neighbouring community. This study clearly provides an image that cements dirt is posing serious threat for respondents' health in the study region. Thus, it is need of the hour to create awareness among the residents about the safety measures such as covering their noses and mouths with cloths to reduce inhalation of cement dust.

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