
ASSESSING THE IMPACT ON CEMENT INDUSTRIES IN ARIYALUR CITY

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ABSTRACT

This study aims to investigate the impact of cement industrial pollutants on Ariyalur City. This study delves into the multifaceted impact of cement industries on both human health and environmental integrity. Through comprehensive analysis, it uncovers the relationship between cement production processes and their potential adverse effects. By examining various dimensions including air and water pollution, land degradation, and resource depletion, this research elucidates the nuanced implications of cement manufacturing on the well-being of communities. The cement industry is an enormous intensive and produces many dusts, emissions, and noise. This study investigates the potential relationship between cement industries and their adverse effects on human health and the environment. Cement production, a vital component of global construction and infrastructure development, has long been scrutinized for its potential environmental. It scrutinizes the emissions of greenhouse gases, particulate matter, and other pollutants from cement plants. the study aims to elucidate the extent to which cement industries contribute to negative consequences, spanning from local. The research aims to explore whether there exists a significant correlation between the operations of cement plants and negative impacts on both human well-being and ecological balance. Data collection involves administering structured questionnaires to residents living near cement industries to gather information. Through a comprehensive review of existing literature, empirical data analysis, and theoretical frameworks, this research aims to elucidate the complex interactions and causal pathways linking cement industries to negative outcomes in human health and environmental integrity. The study employs a mixed-methods approach, combining quantitative surveys and spatial analysis to assess the relationship between cement industry pollution impact.

KEYWORDS: Cement Industry, Impacts, Environment, Human Health, Pollutant, Communities

INTRODUCTION:

Nowadays, the cement industry is causing many environmental pollution problems. The pollutants of the cement industry produce adverse impacts on Air, Water, And Land. The cement industry is one of the 17 most polluting industries listed by the Central Pollution Control Board in India. Its rich deposits of limestone, are a primary raw material used in cement manufacturing. It may be recalled that the area near Ariyalur, witnessed an unusual phenomenon of increasing the sea about 120 million years ago. The unwanted area extending over one lakh hectors comprised, what is presently called, Jayakondam, Andimadam, Karai,

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Kolakkanatham, Dalmiapuram, Sathanur, Kunnam, Utathur, Ariyalur, and Keezhapalur villages, withdrew from the area after 40 million years ago the limestone mining and different stages of cement manufacture cause hazardous environmental impacts. There has been an increase in the number of quicklime manufacturing units, limestone, and sandstone quarries in the area thereby increasing dust pollution. Cementing industries are the most important polluting industries in India. pollution in construction sites is of dusty facilities. Dust pollution is the introduction of chemicals, particulate matter, or discomfort to humans or other living organisms, or causes damage to the natural environment. In Ariyalur district of Tamil Nadu cement factories are located. Cement pollution leads to various negative externalities on land, water, crops, and human health. the negative externalities on land, water, and crops especially in the form of yield decline, decline in water quality and land quality, averting or defensive expenditure for land and water, and the health status of farmers were studied separately. the productivity and concentration of chlorophyll in a number of crops decreased. Further, environmental valuation techniques and household health production functions were also attempted in the study to gain a finer perspective of cement pollution. These include agricultural lands, natural vegetation, towns, and villages, such depositions of particulate matter and other pollutants interfere with the normal metabolic activities of plants, causing direct injury and impairment of growth and quality and may ultimately lead to a decrease in plant yield. Furthermore, the extraction of raw materials for cement production, such as limestone, clay, and gypsum, can result in habitat destruction, soil erosion, and biodiversity loss. The process of quarrying and mining can disrupt ecosystems and alter landscapes, leading to long-term environmental consequences. Ariyalur exemplifies the intricate relationship between economic development, industrialization, and environmental stewardship. the multifaceted impacts of cement industries on both the environment and society. Its intensive energy consumption and greenhouse gas emissions are central to the environmental concerns surrounding cement production. As these cement plants dot the landscape, they not only contribute significantly to the region's economic prosperity but also raise pertinent questions about their impacts on the environment, public health, and social well-being.

RESEARCH PROBLEM:

It investigates the various dimensions of this relationship, including the environmental impacts of cement production processes such as air and water pollution, land degradation, and resource depletion, as well as the potential health risks posed to individuals living near cement plants. By examining the mechanisms through which cement industries may contribute to environmental degradation.

REVIEW OF LITERATURE:**Saida naik nenavath, Ashok Kumar lonavath**

Article: Effect of cement industries on the environment in selected villages of Damaracherla and Nereducherla manuals in Nalgonda district, Telangana

Description: it's focused on this literature review Levels into the effects of cement industries on the environment

Raja Subramanian Devarajan, Krishna ram hanumappa

Article: Ariyalur cement cities of India its present status and grave impact of dust pollution on some important crops

Description: they focused on and studied in correlation with dust pollution its importance and its impacts on crops. They mainly studied the drastic environmental degradation that leads to pollution

Dr. Ravi, shambulingappa.f. nallanavar

Article: History & Growth of cement industry in India -A study

Description: The author explains the history and growth of the cement industry in India

Kayalvizhi & amarnath

Article: An environmental impact asseement cement pollution in ariyalur district in tamilnadu

Description: The study revealed that the decline in crop production was directly related with pollution intensity. The agriculture damage function related the value of agriculture damages to averting expenditure of land and irrigation water and quality indices of land and water quality .

Uzma R, Zahoor Ahmad Bhat, Tahir Ali, Sofi K, Tajamul, Rihana

Article: A review of the impact of cement dust on soil health with special reference to Kashmir, India

Description: This review examines the impact of cement dust on soil health in Kashmir, India .it provides the details of the impact of cement dust on environmental quality and soil health in that region.

V. Ramesh, S. Ahmed John and M. Koperuncholan

Article: Impact of cement industries dust on selective green plants: a case study in ariyalur industrial zone

Description: This researcher focused on specifically in the industrial dust on selective green plants on the near by residents in the industrial zone .

Ramesh, A.

Article titled: "Industrial Pollution and Its Impact on Human Health: A Case Study in Salem, Tamil Nadu, India"

Description: Focused on a specific geographical area, this literature review delves into the effects of industrial pollution on human health in Salem, Tamil Nadu, India. It provides a detailed analysis of the pollutants released by industries in the region and their repercussions on the health and well-being of the local population.

SCOPE AND LIMITATION OF THE STUDY:

- Identification of the impact of cement industries in Ariyalur City
- Conduct a Study to evaluate the impact prevalence among residents living near cement manufacturing plants.
- This study had a focus on impacts that affect the natural resources near the industrial plants.
- To improve the health and well-being of human beings, animals, and plants.
- This study Focuses on the impact on cement industries particularly in Ariyalur City.

AIM AND OBJECTIVES:

- To study the effects of cement industries on environmental quality.
- To evaluate the level of engagement between cement industries and local communities.
- To provide recommendations for continuous improvement and long-term viability of cement industries.
- To study the impact of cement industries on agriculture and livelihood.
- To evaluate the effects associated with cement production in Ariyalur.

HYPOTHESIS:

Null Hypothesis (H₀): There is no significant relationship between cement industries and adverse effects on human health and the environment.

Alternative Hypothesis (H₁): There is a significant relationship between cement industries and adverse effects on human health and the environment.

RESEARCH METHODOLOGY:

In this study, the researcher has used Non Doctrinal Research Methodology. The researcher obtained the primary source of data by conducting an empirical study on seeking responses from the General Public living near the areas with high industrial pollution levels. The research method is based on questionnaires.

CEMENT INDUSTRIAL POLLUTION :

Industrial air pollution is when factories, mines, and transportation release harmful substances into the air. These pollutants can cause health problems such as respiratory diseases, cancers, decreased lung function, and asthma. They can also harm the environment, leading to things like acid rain and climate change. Industrial facilities emit a wide range of pollutants into the air, including particulate matter, sulfur dioxide, nitrogen oxides, and other toxic chemicals.

IMPACT ON CEMENT INDUSTRIAL POLLUTANT :

- **Carbonate Rock Mining:** The extraction of limestone, a key raw material in cement production, involves mining carbonate rock formations, which can lead to geological disturbances and ecosystem fragmentation. Mining activities can disrupt underground aquifers, alter drainage patterns, and increase the risk of soil erosion and landslides.
- **Noise Pollution:** Cement manufacturing operations, particularly quarrying and processing activities, can generate significant noise pollution, impacting nearby communities and wildlife. Prolonged exposure to high levels of noise can have adverse effects on human health and wildlife behaviour.
- **Air Pollution:** Cement manufacturing processes release various pollutants into the atmosphere, including particulate matter, sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOCs). These pollutants can contribute to respiratory problems, smog formation, and acid rain.
- **Health Impacts:** Cement production can have direct and indirect health impacts on nearby communities. Exposure to air pollutants emitted from cement plants, such as particulate matter and sulfur dioxide, can exacerbate respiratory conditions and increase the risk of cardiovascular diseases. Dust from quarrying operations can also pose respiratory hazards to workers and nearby resident.

LEGAL MEASURES FOR MITIGATING CEMENT INDUSTRIES POLLUTION:***Tamil Nadu Pollution Control Board vs. Ultra Tech Cement Limited (2019)***

This case addressed environmental concerns related to the operations of Ultra Tech Cement Limited's plant in Tamil Nadu. The Tamil Nadu Pollution Control Board (TNPCB) raised issues regarding air and water pollution caused by the plant's activities. The Madras High Court directed the company to comply with pollution control norms and take measures to mitigate its environmental impact. The case highlighted the importance of enforcing environmental regulations in the cement industry to protect the health and well-being of local communities.

Residents Welfare Association v. Tamil Nadu Pollution Control Board & Others

In this case, residents living near a cement plant in Tamil Nadu filed a petition alleging air and water pollution, noise disturbances, and health hazards caused by the plant's operations. The Madras High Court issued directives to the Tamil Nadu Pollution Control Board (TNPCB) to conduct inspections, enforce pollution control measures, and address public grievances, emphasizing the importance of protecting community health and environmental quality.

VIEWPOINT OF UNDER ARTICLE 21

Article 21 of the Constitution of India guarantees the fundamental right to life and personal liberty, stating that "No person shall be deprived of his life or personal liberty except according to procedure established by law.

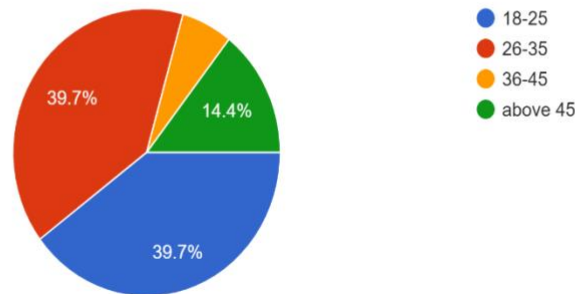
Under Article 21, the judiciary has recognized the right to a clean and healthy environment as a fundamental aspect of the right to life and personal liberty. This interpretation acknowledges that environmental degradation, pollution, and ecological imbalances can have profound impacts on human health, well-being, and quality of life. As such, the state has a duty to protect and preserve the environment for the benefit of present and future generations.

Right to Clean Environment: Residents living near cement plants have the right to live in a clean and healthy environment, free from pollution and environmental hazards. Cement manufacturing operations, if not properly regulated, can emit air pollutants, such as particulate matter, sulfur dioxide, and nitrogen oxides, which can adversely affect air quality and public health and protect the rights of affected communities.

ANALYSIS OF THE SURVEY CONDUCTED:

GRAPH 1:

what is your age?
194 responses

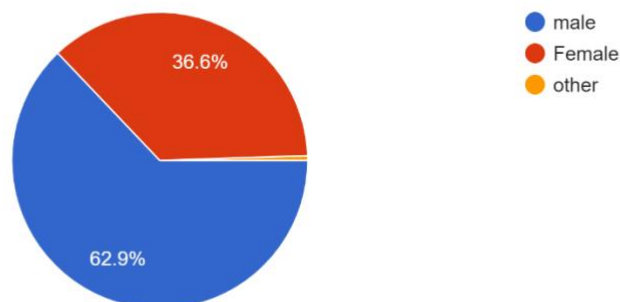


Legend: From the graph 1, it is observed that it exhibits the age distribution of the respondents and their opinions on the impact of cement industries.

Result: the survey in Graph 1 , it is observed that it exhibits the age distribution of the respondents and their opinion on the impact of cement industries. The maximum number of responses was collected between the age group of 18-25 & 26-35 whereas the minimum response was between the age group 36-45.

GRAPH 2:

what is your gender?
194 responses

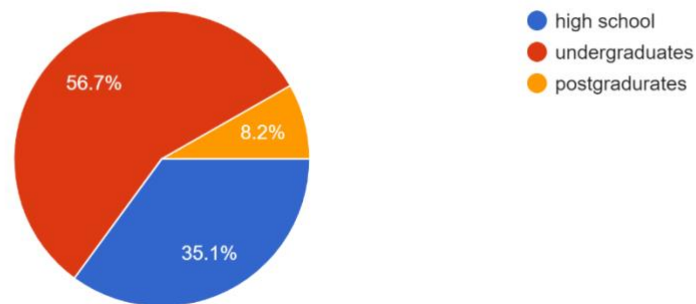


legend: From graph 2, it is observed that it exhibits the Gender distribution of the respondents and their opinions on the impact of cement industries.

Result: the survey in Graph 2, it is observed it is observed that it exhibits the Gender distribution of the respondents and their opinions on the impact of cement industries. The maximum number of responses was collected between the males.

GRAPH3:

educational qualifications
194 responses

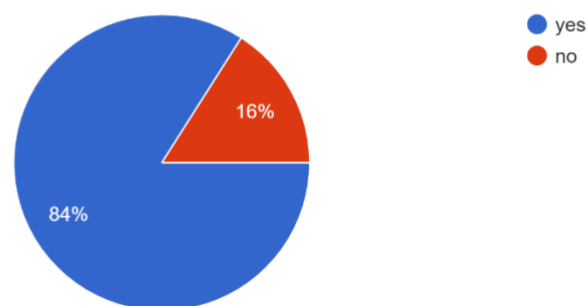


legend: The graph3 shows that it exhibits the educational qualifications distribution of the respondents and their opinions on the impact of cement industries.

Result: the survey in Graph 3, it is observed that it exhibits the educational qualifications distribution of the respondents and their opinions on the impact of cement industries. The maximum number of responses was collected from the undergraduates.

GRAPH 4:

Have you observed any changes in local air quality, such as increased dust or pollutants, near cement manufacturing in your community?
194 responses



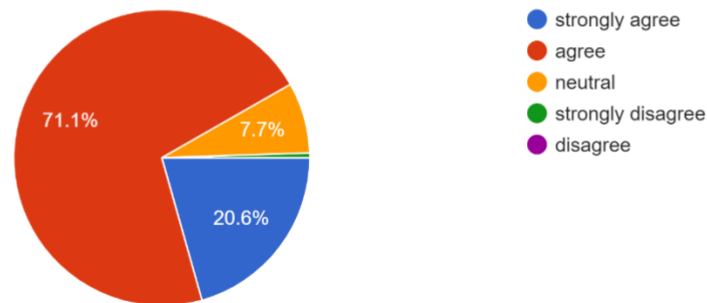
legend: from graph 4, it is observed that it exhibits have you observed any changes in local air quality.

Result: The survey in graph 4 shows that it exhibits the distribution of respondent and their opinion on any changes in local air quality. the maximum number of responses was collected they noticed the changes in local air quality such as increased dust pollutants near the cement manufacturing in their community.

GRAPH 5:

The noise pollution or disruptions to local communities caused by cement manufacturing operations

194 responses



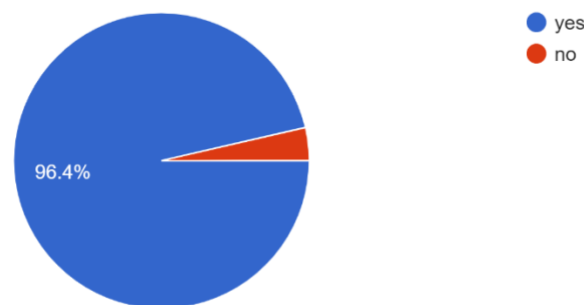
Legend: from graph 5 ,it is observed that it exhibits the noise pollution or disruptions to local community caused by the cement manufacturing operations.

Result: The survey in graph 5,it is observed that it exhibits the distribution of respondent and their opinion on the noise pollution or disruptions to local community caused by the cement manufacturing operations . the maximum number of the response was collected they agree with the statement .

GRAPH 6:

Do you aware of the effects of cement dust and particulate matter on soil quality and agricultural productivity?

194 responses



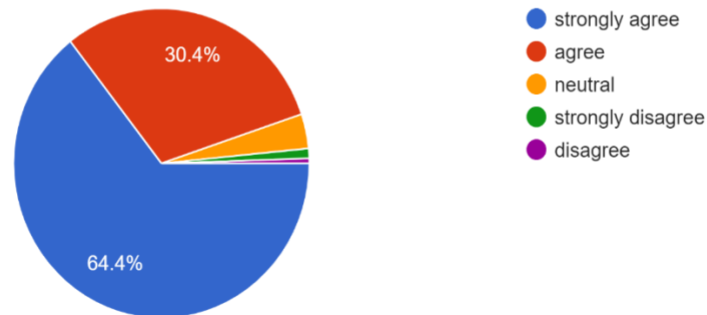
legend : from graph 6,it is observed that it exhibits aware of the effects of cement dust and particulate matter on soil quality and agricultural productivity.

Result: The survey in Graph 6,it is observed that it exhibits the distribution of respondent and their opinion on aware of the effects of cement dust and particulate matter on soil quality and agricultural productivity. The maximum number of the response was collected they said to know their knowledge.

GRAPH 7:

the emissions from cement factories contribute to respiratory issues or other health problems in nearby residents

194 responses



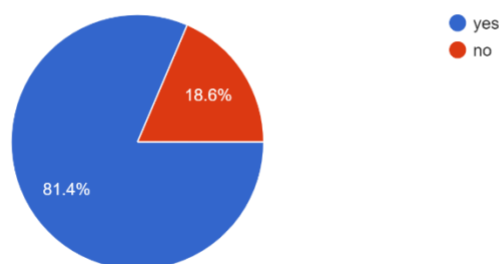
Legend: from graph 7 , it is observed that it exhibits the emission from the cement factories contribute to respiratory issues or other health problem in nearby residents.

Result: The survey in Graph 7, it is observed that it exhibits the distribution of respondent and their opinion on the emission from the cement factories contribute to respiratory issues or other health problem in nearby residents. the maximum number of the responses was collected they strongly agree with the statement.

GRAPH 8

Have you noticed any changes in local waterways, such as contamination or sedimentation, attributed to runoff from cement manufacturing sites?

194 responses



Legend: from graph8,it is observed that it exhibits the noticed any changes in local waterways such as contamination or sedimentation attributed to runoff from the cement manufacturing sites .

Result: The survey in graph 8, it is observed that it exhibits the distribution of respondent and their opinion exhibits the noticed changes in local waterways, such as contamination or

sedimentation attributed to runoff from the cement manufacturing sites. the maximum number of the responses collected they observed the changes in waterways .

RESULTS OF THE RESEARCH:

The study of the research, it reveals that Ariyalur City underscores the significant impact of cement industrial pollution on human health and the environment. Therefore the alternative Hypothesis is proved that There is a significant relationship between cement industries and adverse effects on human health and the environment. Through concerted efforts and collective action, we can mitigate the adverse effects of cement industrial pollution and pave the way towards a sustainable future for all.

CONCLUSION AND SUGGESTIONS:

In conclusion, the impact of cement industries on the environment and human health is significant and multifaceted. These include air pollution, water pollution, noise pollution, occupational health hazards, and ecological impacts. The environmental footprint of cement industries stems primarily from emissions of air pollutants such as particulate matter, sulfur dioxide, nitrogen oxides, and carbon dioxide. These pollutants contribute to local air quality degradation, respiratory diseases, climate change, and ecological disruption. Water pollution from cement manufacturing activities, including wastewater discharge and dust leaching, poses risks to aquatic ecosystems and groundwater resources. Noise pollution from cement plants can also affect nearby communities, leading to stress, sleep disturbances, and reduced quality of life. Moreover, workers in cement manufacturing facilities face occupational health risks due to exposure to cement dust, silica, heavy metals, and ergonomic hazards. These occupational hazards can result in respiratory illnesses, lung diseases, hearing loss, and other health problems among workers. Addressing the environmental and health impacts of cement industries requires concerted efforts from regulatory authorities, industry stakeholders, and civil society. The study involves suggestions namely:

- Carbon Neutrality and Net-Zero Targets
- Environmental Impact Assessments and Monitoring
- Implementing pollution control measures,
- adopting cleaner production technologies,
- promoting sustainable practices, and

In conclusion, addressing the impact of cement industries on the environment and human health is essential for promoting sustainable development, protecting public health, and ensuring the environment.



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