

Cement industries Impact on Agriculture and Health in Damaracherla and Nereducherlamandals in Nalgonda District

Saida Naik Nenavath¹, Ashok Kumar Lonavath²

¹Department of Geography, Osmania University, Hyderabad-500007, Telangana, India

²Professor, Department of Geography, Osmania University, Hyderabad-500007, Telangana, India
Corresponding Author Email: [saidanaikgeography\[at\]gmail.com](mailto:saidanaikgeography[at]gmail.com)

Abstract: *Rapid urbanization and development in various industrial sectors have not only relieved the country from the grip of nature's whims, but also terminated in adverse environmental impacts endangering not only our natural resources like agricultural lands, forest wetland, rivers, lakes, biomes, natural biological and genetic wealth, but also ill effects of the health and the very survival of living organisms and endangered species. Cement industry is one of the 15 most polluting industries listed by the Central Pollution Control Board, Government of India. It is the major source of particulate matter CO₂, Nox and SO₂ emissions. Impact from different industries and particularly from cement industry is a major area of research to overcome the problem of environmental damage. The present research work was carried out on environmental pollution in Damaracherla & Nereducherla Mandalas in Nalgonda District, Telangana. In conclusion, the cement industries and other associated industries causing the harmful effects on environment in Damaracherla&Nereducherla Mandalas.*

Keywords: Cement industry, environmental pollution, agriculture, crops and soil

1. Introduction

The speedy industrialization was parallelly helps to the rapid urbanization on one side and the industrial expansion on the other is a common phenomenon in many parts of our country and world. Developing countries mainly India and China are presently facing serious problem of poor environment air quality due to rapid growth of population and industrialization. Since the execution of five-year plans, the socio-economic structure of India began to show noteworthy geographies.

Cement industry is one of the 15 most polluting industries listed by the Central Pollution Control Board. It is the major source of particulate matter, carbon dioxide (CO₂), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂) emissions. Impact from different industries and particularly from cement industry is a major area of research to overcome the problem of environmental degradation. Since early 1970s, it has been evident that air pollution affects the health of human beings and animals, damages of flora and fauna, soils and worsens materials and generally affects not only the large urban areas but also the medium sized cities, talukas and municipal areas [1, 2, 3].

Environment pollution has a larger impact on human health, global warming, agriculture and natural ecosystem. Cement releases heavy amount of dust and it contains heavy metals like Chromium, Nickel, Cobalt, Lead and Mercury pollutants hazardous to the biotic environment particularly affecting agriculture, human and animal health; and ecosystem [4].

About the study area

Telangana, as a geographical and political entity was born on June 2, 2014 as the 29th and the youngest state in Union

of India [5]. Nalgonda is a district in the southern part of the state. Telangana located on the south-central stretch of the Indian peninsula on the consists mostly of hills, mountain ranges, and thick dense forests covering an area of 27, 292 km². Telangana encompasses an area of 112, 077 km² sq. km lying between 17.366°N North latitude and 78.475°E East longitude. Telangana is the 12th largest state of India in terms of area. The state is comprised of arid, semi-arid and sub humid conditions. It is bounded by Maharashtra on the north, Chhattisgarh to the northeast, Karnataka to the west, and Andhra Pradesh to the east and south [6, 7].

The main economy of Telangana is agrarian in nature. Agriculture is the leading contributor to the economy of the Nalgonda district accounting for 44.5 per cent. The total cultivated area of the state encompasses about 7.12lakh hectares and out of this only 50% (4.74 lakh hectares) of the land is irrigated. The principal crops rice, cotton, gram, pulses, millets, jowar, maize, ground nuts, fruits, vegetables and spices. [8]

Nalgonda district is located in the Telangana state of India. It has a populace of 3, 483, 648 of which 13.32% is urban as of 2011. The district is spread over a region of 2, 449.79 square kilometers (945.87 sq. mi). Starting at 2011 Census of India, the region has a population of 1, 631, 399 Nalgonda region is the fourth biggest region of Telangana. It is situated between 16° 25' and 17° 5' N of scope, 78° 4' and 80° 05' E of longitude. The region covers a zone of 14° 240 sq. kms. The primary crops that are developed in this region are paddy, cotton, chilies, maize, millets, ground nut and jowar were the major crops in this region. Also this region is popular fluorine water due the industry ground water pollution. The Krishna River, Musi River, Aleru,

Peddavagu, Dindi River, Halia River and Paleru course through the Nalgonda area [9].

Penna cement industries ltd (PCIL):

Penna cement industries was formed in year 1991 by Penna cement nereducherlamandaljanaphad village the capacity of 0.2mtpa. PCIL was ISO 9001: 2008.

Deccan cement limited (DCL):

Deccan cement limited was estimated in 1979 to set up a mini cement plant. DCL was the first mincemeat plant in the country using dry process rotary kiln pre-calcinatory technology for the manufacture of ordinary port land in technical collaboration with node engineering of Japan. Dcl 1.00 million tpa along with setting up of the capacity coal board power plant of 15 mw. The project site is at bhanipuram in nalgondadist. of Telangana.

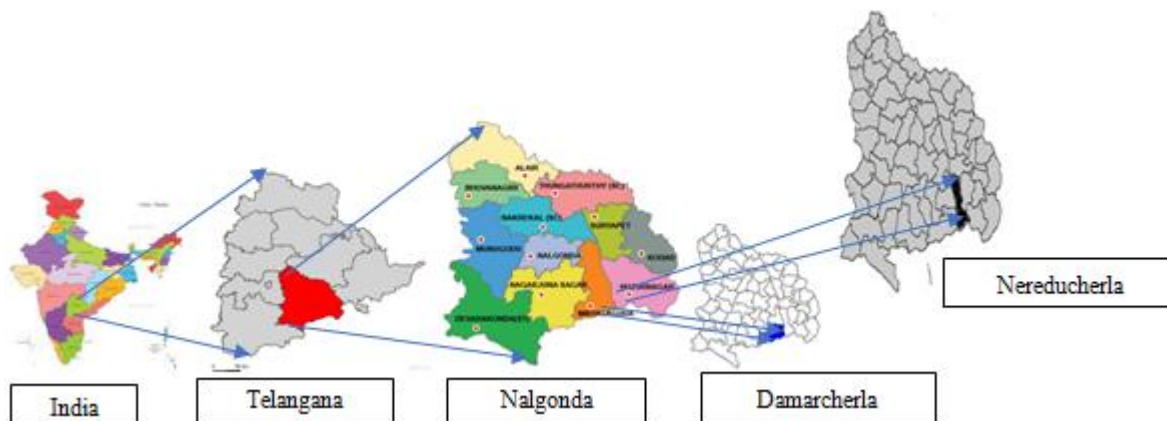


Figure 1: Study area [Source: National Geographic Society]

2. Review of Literature

In India, is the second largest cement producing country in the globe, the first cement plant was established at Porbandar, Gujarat in 1914 by India Cement Company Limited. After these two more cement plants; one at Katni (M. P.) and another at Lakheri (Rajasthan) were established.

In the initial decades the cement sector presented the incredible growth in mounted capacity, number of plants and production. The cement industry showed a growth from 0.0001 m. t. in 1914 to 1.5 m. t. in 1940, 2.2 m. t. in 1950 and 14.40 m. t. from 1970-71. During the period of 1970-71 to 1988-89 just before decontrol and delicensing of the industry, the average annual growth rates of cement installed capacity and production were 7.12% and 6.64% respectively (Cement Manufacturing Association) [10].

Cement is a fine powder, gray power which sets after a 6-8 hours when mixed with water and then hardens in a 3-5 days into a solid, strong material. Practically all the cement produced across the globe is mixed with sand, aggregates and water to make concretes and mortars. Concrete is second only to wafer as the most consumed, substance on earth with nearly three tons used annually for each person on the planet. "Cement" is the prime ingredient in concrete, locking together the sand and 1 gravel constituents in an inert matrix. It is therefore a critical part of meeting society's heeds for basic infrastructure such as dams, bridges, CC roads, water treatment facilities, houses, schools, administrative buildings and hospitals [11].

Cement like products were first founded in Greek and Roman structures over 2000 years ago, but the contemporary cement was first produced in the early 1800s. Portland cement was patented in 1824 and by the end of the 19th century concrete, based on Portland cement, had become a

highly appreciated construction material throughout Europe [12].

Table 1.1: World cement production

| | |
|--------------------|------------------|
| China 30% | USA 5% |
| Other Asia 23% | Other America 8% |
| European Union 12& | Other Europe 6% |
| Africa 4% | Japan 7% |
| Former USSR 4% | Oceania 1% |

Industries are the major reason for the environmental pollution and particularly from cement industry is a major area of research to overcome the problem of environmental degradation. Since early1980s, it has been evident that air pollution affects the health of human beings and animals, harmful effects on agriculture, water, land and deteriorates material sand generally affects not only the large metropolitan areas but also the medium sized cities and urban areas.

Air pollution has a greater impact on human health, climate change, agriculture and natural ecosystem. Cement dust contains heavy metals like Chromium, Nickel, Cobalt, Lead and Mercury pollutants hazardous to the biotic environment particularly affecting vegetation, human and animal health; and ecosystem.

Speedy industrialization was one of the major culprits for pollution, industrial waste, effluents and unused materials contains toxic substances, which are responsible for altering the surround ecological systems. Different industrial discharges damage to various natural resources in the environment such as water, air, soil and agriculture.

Air pollution is the majorly in the environment by industries and main threat to the survival of plants in the industrial areas due to the toxic particles of cement dust on some plants.

Few studies reported that the toxic compounds such as copper, fluoride, lead, zinc, copper, hydrochloric acid, magnesium, sulfuric acid and beryllium emitted by cement manufacturing plants. Shah et al. (1989) had found the cement dust pollution as an operative ecological factor causing deterioration in the quality of our environment.

Lakshminarayana Komati reported that the impact on the environment due to industrial development in Nalgonda district and shown the opencast extraction activities like drilling, blasting, material handling and transport as a potential source of environmental, soil and air pollution. Also estimated the effect of environmental of the cement production and its variations between different cement plants.

Research Gaps

The present research work was carried in October, 2018 to March, 2020. Literature survey shows that, no systematic, extensive studies have been conducted of environmental pollution such as soil, water and air in Damaracherla & Nereducherla Mandalas in Nalgonda District, Telangana. Air born dust, SO₂, CO₂, NO_x, which arise due to mining, crushing, milling and coal burning, in cement industries causes' toxic effect on human and its environment.

Objectives of the study

Main aim is to study impact of cement industries on environment in the area Damaracherlamandal & Nereducherla Mandal in Nalgonda District, Telangana and to evolve solution for the present pollution problem in the frame work.

- To study the cement industries growth & development in Damaracherla & Nereducherla Mandalas in Nalgonda District, Telangana.
- To study the impact of cement industry on environmental related factors such as pollution, health, agriculture, transportation, livelihood, settlements, vegetation and natural resources.
- To argue the present system effective methods for environmental impact and suggest alternatives.
- To develop a strong management system to integrate the present complex system and solve the environment problem.

Data collection and methodology

The study design has been outlined in the methodology. The study was carried by collecting the primary and secondary data. Detail questionnaire will be employed to collect the primary data on sample basis.

The secondary data will be collected from existing sources like Govt and private data source the data thus collected will be processed by applying the statistical and Cartography techniques. The computation and analysis will be done by using (GIS) Geographical information technology.

Our report may be helpful to the central and state governments to allocate sufficient long-term funding to prevent the adverse health impacts of cement industry pollution. Control of environmental pollution in India will not only improve health as envisioned in the SDGs, but will also accelerate the potential to achieve other SDG targets,

including alleviating poverty, promoting social justice, enhancing the live ability of India's cities, and reducing the pace of climatic changes. Environmental pollution control in India is not an expenditure, but rather an essential investment in the country's future economic growth. Strengthening the ongoing efforts to manage and prevent air pollution would help in avoiding the substantial economic losses attributable to air pollution in the states of India.

3. Methodology

The present study was carried out in eight villages in Damaracherla and eight villages in Nereducherla Nalgonda district. Major cement factories in this area are mainly, i. e., Penna Cements L. td, Deccan Cements L. td and The Indian Cement factory.

Sample Design

This study was aimed to analyze the harmful effects cement industries in damaracherla and nereducherlamandalas in Nalgonda districts. To achieve this, data were collected using structured questionnaire which were administered on Damaracherla and Nereducherlamandal basis in the study area.

Data Collection

The present study was based on primary and secondary sources of data, the primary data collected from each household, relating to various parameters of health status and environment, through well designed and structured questionnaire and interviews. The secondary sources of data collected from the District Pollution Board, MDO offices and management of industries.

4. Results and discussion

The results of the questionnaire were listed below section wise. Figure 2 shows that the age of respondents of this research study is classified into five groups. Mainly first group is between below 20 years, second group 20-30 years, third group 30-40 years, fourth group 40-50 years and fifth group are 50 and above years respectively. All the respondents in this research study lives within the 2-5km radius from the cement industry in both damaracherla and Nereducherlamandalas of Nalgonda District.

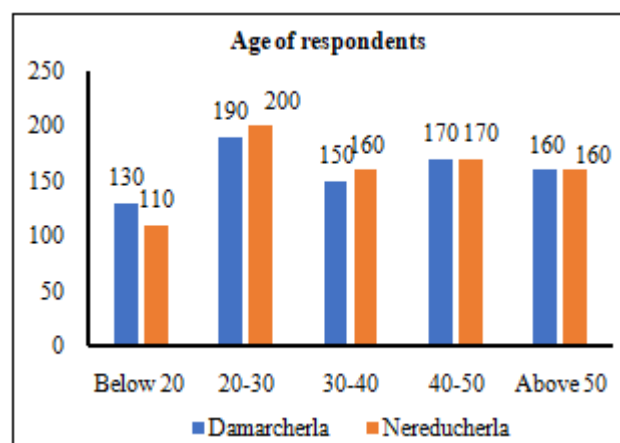


Figure 2: Field study data

Table-2 represents the response of the respondents, different types pollution causes by cement industries in damarcherla and nereducherlamandals. Majority of the respondents said that, cement industries are the major reason for the environmental pollution such as Air, Soil and Water pollution in this area.

Table 2: Field study data

| | Air | Soil | Water |
|--------------|-----|------|-------|
| Damarcherla | 740 | 580 | 660 |
| Nereducherla | 675 | 720 | 590 |

Table-3 represent different diseases caused by cement industries in the study region.

Table 3: Field study data

| | Asthma | Brochities | Pneumonia | cough | Skin diseases | lung infections |
|--------------|--------|------------|-----------|-------|---------------|-----------------|
| Damarcherla | 720 | 650 | 660 | 740 | 550 | 720 |
| Nereducherla | 740 | 618 | 710 | 670 | 620 | 640 |

Majority of the respondents are stated that cough, asthma, lung infections, pneumonia, bronchitis and skin diseases caused by the cement industries in this area.

5. Conclusion

Our study has concluded that cement factories such as Rasi, Penna and Deccan Cements factories cause for the environmental pollution in this area. Also, our study revealed the health risks of villagers nearby this cement industries. Cements cement factory causes to different types of pollution such as air, soil, water, chemical, noise and waste pollution while those that resides between 1km to 5km from these industries are more prone pollution related diseases such as asthma, lung infections and skin diseases, this pollution also impacts on agriculture and crop production in this area. Government and cement industries should look into the pollution control policy and put into consideration on no occasion should any residential building, agriculture and farming be allowed for approval within 1km to any cement factory in order to reduce harmful effects on people and society.

Organization of the study

Chapter 1: Introduction: An Over View of Impact of Cement Industry on Environment.

It covers origin of cement industry in India, Telangana and Nalgonda, review of literature, Data collection, objectives, hypotheses, research methodology, and locale and time period of the study, sample design and organization of chapter scheme.

Chapter 2: Socio-economic and Demographic Aspects.

This chapter will be dealt with the socio economic and demographic patterns such as relief, financial status, location, soils, and other resources, food grains, cement industry impacts on lives, cultivation and agricultural labourers in Damarcherla and Nereducherla.

Chapter 3: Employment, Livelihood, Health, Transportation, Land Use / Land Cover.

This chapter will study the employment facilities, health facilities, transportation, sources of irrigation, crop-wise area under irrigation and irrigation intensity and cement industry impact on this area.

Chapter 4: Cement Industries and environment.

This chapter will examine the cement industry effect on air quality, soil damage, water pollution and cropping pattern

and intensity of cropping in Damarcherla and Nereducherla region.

Chapter 5: Environment protection measures

This chapter is mainly focused on environmental protection measure to avoid the cement industry pollution particularly in this region.

Chapter 6: Analysis and interpretation

This chapter is mainly focused on data analysis and interpretation of the research design mainly.

Chapter 7: Conclusions

This chapter is devoted to primary study. Eight villages have selected for primary survey. Summary of Conclusions It presents the concluding remarks and will try to sum up the research work.

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