# Prevention and Control of Air Pollution in Industries in Kerala - An Evaluation Study

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***ABSTRACT***
*The significance prevailing in India with regards to air pollution is that most of the industrial units are located in populated area. Industrial estates and complexes have been located closely to the residential area without considering of the consequence of the environmental pollution. Emission from such industrial units close to residential area damages to human and animal life. It is observed that emission rate from Indian industries when compared to other countries indicated that refineries, cement factories, steel, coal-based power plant, oil-based power stations, sulphuric acid units and petrochemical industries emit considerable quantity of pollutants.*

*Air quality has been undertaken in some of the industries in India shows that Indian industrial chimneys and power houses emit pollutant to air such as SPM (suspended particulate matter) smoke, dust, sulphuric dioxide, carbon monoxide, nitrogen oxide, fluorides, silicon etc. Emission whether it is from particular industries or from a group of industries all in fact pollutes the atmosphere. The available resources and know how should be utilized by every industry to the optimum extent in order to bring down the effect of environmental pollution. An attempt has been made to find out to what extent the study unit complied with the provision of air pollution act 1981 in order to prevent and control the air pollution in state industries.*

*Key words: air pollution, industries, emission*

## INTRODUCTION

Historically, the efforts of air pollution control in India date back to the mid of nineteenth century. Many of these Act's deal with environmental regulation in a piecemeal manner were indicated in nature and proved ineffective in reducing the levels of pollution. The land mark in the recent times in environmental regulation was the passing of the Water (prevention and control of pollution) Act 1974 and Air (prevention and control of pollution) Act, 1981. The Water act 1974 resulted in the Institutionalization of pollution control machinery by establishing the central pollution control board (CPCB) and state pollution control boards (SPCB). The significance prevailing in India with regards to air pollution is that most of the industrial units and estates are located in populated residential area. Emission from such industrial units close to residential area damages to human and animal life. It is observed that emission rate from Indian industries when compared to other countries indicated that refineries, cement factories, steel, coal-based power plant, oil-based power stations, sulphuric acid units and petrochemical industries emit considerable quantity of pollutants.

Air quality has been undertaken in some of the industries in India shows that Indian industrial chimneys and power houses emit pollutant to air such as SPM (suspended particulate matter) smoke, dust, sulphuric dioxide, carbon monoxide, nitrogen oxide, fluorides, silicon etc. In big industrial centers where number of industries exits, the environmental preservation activity can made as group task by the industries. Emission whether it is from particular industries or from a group of industries all in fact pollutes the atmosphere. The available resources and know how should be utilized by every industries to the optimum extent in order to bring down the effect of environmental pollution. An attempt has been made to find out to what extent the study unit complied with the provision of air pollution act 1981 in order to prevent and control the air pollution in state industries.

## STATEMENT OF THE PROBLEM

Air pollution is one of the serious environmental challenges prevailing globally, with industrial activities being one of the primary contributors. In Kerala, a state known for its rich biodiversity and unique ecosystems, the impact of industrial air pollution poses serious threats to public health, environmental sustainability, and economic development. The rapid industrialization in Kerala, while contributing to economic growth, has also led to increased emissions of pollutants such as particulate matter (PM), sulphur dioxide (SO2), nitrogen oxides (NOx), and volatile organic compounds (VOCs).

This evaluation study aims to assess the current state of air pollution in industries across Kerala, focusing on the effectiveness of existing prevention and control measures. Industrial activities are a major source of air pollution, and despite existing regulations, many industries continue to emit harmful pollutants. This study seeks to examine the effectiveness of current prevention and control measures, identify gaps in implementation, and evaluate their impact on environmental and public health."

SAMPLING DESIGN

As per the pollution status of central pollution control board, Red category industries are the highly polluting industries, where the samples collected are from the red category industries only. In Kerala the list published by Kerala State Industrial Development Corporation, there are 78 highly polluting units. To select the sample industries the industrial area has been divided into three zones, namely North Kerala, Central Kerala and South Kerala. The total number of industries in each zone has been categoriesed, and found 20 chemical industries, 19 Agro industries, 19 rubber industries, 8 cement industries and 12 other types of industries. For the convenience of the study, 50 percent of representation were given to the industries, that are more than 15 in numbers, and 100 percent representation were given to the industries that are less than 15 in numbers. Hence, the sample of 10 units in chemical industries, 10 in Agro, 10 in rubber, 8 in cement and 12 in other industries are selected. A total of 50 units were selected for the study.

FINDINGS

1. The major portion of the study units are located in Panchayat limit and 50 percent of them are are private sector, 38 percent of the units are public sector and the remaining 12 percent of the sample units are joint sector.
2. All the units had appointed air pollution control maintenance staff, to prevent and control the level of air pollution but not as per the requirement. Ie technical staff are low in numbers compared with non-technical staff.
3. Only 46 percent of the sample units have appointed air pollution control consultant in the units.
4. Regarding emission process majority (70 percent) of the sample units have a proper emission process.
5. Regarding air pollution control equipment's, 42 percent of the sample units have Bag filters, 30 percent of the sample units have Cyclone Separator, 20 percent of the sample units have dust extraction system,4 percent of the sample units have scrubbers and another 4 percent of the sample units have fly ash arresters.
6. 92 percent of the sample units obtained consent from pollution control board.
7. Majority (60 percent) of the sample units have implemented air pollution control act 1981, where substantial portion of the sample units didn't meet with all the requirement of air pollution control act 1981.
8. From the table 5.13 it is clear that the majority (64 percent) of the units did not conduct ambient air quality survey regularly.
9. Industries are being inspected by pollution control board but not all the industries. 64 percent of the industries were inspected periodically.
10. complaint regarding pollution is received against majority industries which, means the major portion of the units did not fulfill all the requirements of air pollution control act to prevent and control of air pollution.
11. Majority of the units do not carry out solid waste treatment.
12. Majority of the units were asked to provide an effective Air pollution control measures, whereas some of the sample units are given notice to follow the act strictly. It is clear that legal action has been taken by the pollution control board against the defaulters.
13. three fourth of the units are nearer to the habitants which may adversely affect the habitation around the unit.
14. major portions of the population are residing nearer to the industries, where there is a chance for effect of air borne diseases.
15. Majority of the units have developed green belt within the industry as precaution to prevent air pollution.

**TESTING OF HYPOTHESIS**: To test the hypothesis chi-square test has been applied and the result is given below:

***Null Hypothesis:*** *There is no significant association between types of the units and periodic air quality survey conducted*

Chi-Square Tests

| | Value | df | P- value |
|---|---|---|---|
| Pearson Chi-Square | 43.056 | 4 | .000 |

Significant at 1% level (p less than=0.001)

Chi-square test was applied to find whether there is significant relationship between type of units and periodic air quality survey conducted. The calculated value of chi-square is 43.056, which is found to be significant @ 1% level. Hence the hypothesis is rejected. Therefore, it is clear that there is a significant association between type of units and periodic air quality survey conducted.

Hence it can be concluded that the type of the units influences the periodic air quality survey, in preventing and control of air pollution in the units.

SUGGESTIONS

1. Pollution control board can appoint local area environment committees adopt in the role of facilitator for industries to maintain good environmental standards.
2. The state can develop environmental infrastructure required to maintain air quality in the industrial area.
3. A close cooperation between the main equipment designer and the experts in the field of air pollution control can be highly beneficial.
4. A system of reward can be implemented for pollution reductions.
5. Training and awareness programme can be given regarding operation of equipment to minimize energy use and material waste.
6. Detecting day to day care on process and minimizing material lose to air.
7. Making free forums between employees and supervisor to identify and reduce the waste.
8. Collaboration among chemist, engineers and environmental staff can identify, and minimize the air pollution problems.
9. Pollution control board should keep inspecting the units in regular interval.
10.

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