

A Review On DUST MANAGEMENT SYSTEM THROUGH STREET LIGHT POLE & INCREASES THE UTILIZATION OF COAL.

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ABSTRACT

The objective of this research describes the reduction of air pollution on the road and introduces a design model which helps to do it. To control air pollution on the roadside, a model comprises of a fan which is fitted to the street light pole, extracts dust particle from the road and collect it inside that pole through a duct. Here interesting thing is that the bottom side of the hollow and circular cross-section area (hollow cylinder shape) of the street light pole is used as a dust collecting bag. This concept is useful for extracting dust particle from the dusty urban road, road in open cast coal mines, high traffic road, etc where the street light pole is available. Till now the electric pole is useful for street lighting and power transmission only but the continuous increasing of air pollution on the road needs the regular monitoring and control, so we need to give one more work to an electric pole in future i.e. holding dust extractor unit. A need for electric supply for running a fan is also an easy task with this design because it's already an electric pole. It's not to say wrong that the Roads plays a vital role to build a good infrastructure of the city but today it is a major reason for air pollution. For monitoring and controlling of a dusty road, interesting thing is that for the installation of this design we don't need to install a pole near the roadside it is already available for street lighting and only we need to fit collecting system on it. The design also uses the speed of vehicles moving on the road, the extraction of dust by fan is more when the vehicle moving in high speed because turbulence occurs in the air and dust start shifting from one place to another place which leads to strikes the fan with high speed which allows setup simple in design and uses low power, only a fan. Dust removing gate which is fitted on end of the bottom side of the pole, collected dust inside the pole is removing by means of hand, vacuumed, pipeline or conveyor.

The number of pedestrians and riders are decreasing day by day because of bad air quality on the road; also dust particle flying on the road creates judgment problem for drivers and sometimes it leads to a major accident. The extraction of this dust particle from the road by collecting unit provides clear road and good visual coordination for the drivers. This abiotic variable (pollution) is more harmful to our ecosystem.

Every step against pollution is very important for our environment.

Keyword: Dust, Road, Electric pole, fan, vehicles speed etc....

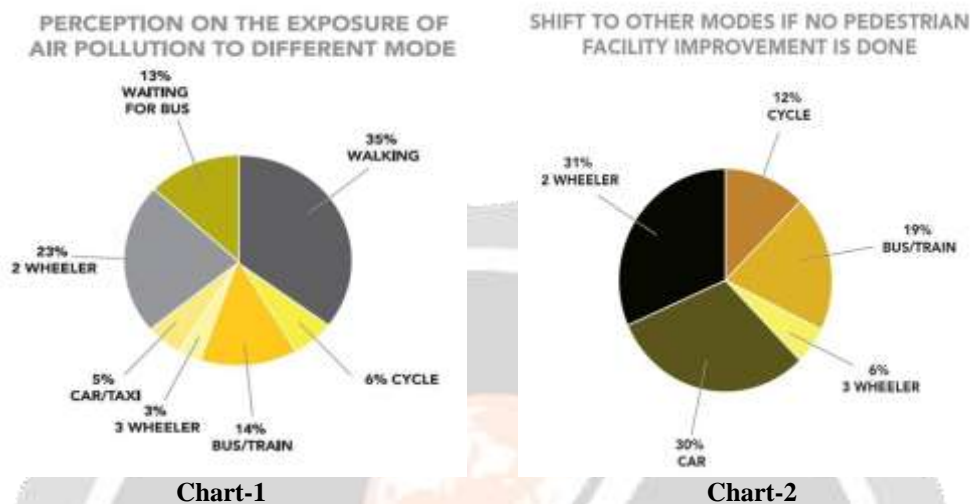
1. INTRODUCTION

An "alarming" 7 million people die each year from air pollution out of these 4.3 million deaths every year as a result of exposure to ambient (outdoor) air pollution, the report said, as air pollution levels remain dangerously high in many parts of the world. More than 90% of pollution-related deaths occur in low- and middle-income countries, mainly in Asia and Africa. 9 out of 10 people worldwide breathe polluted air and of the world's population lives in places where air quality exceeds WHO guideline limits [1].

Road safety is very important to reduce the risk of accident, in the same way road air quality should keep in the safe condition especially for pedestrians and riders who are directly exposed by it.

1.1 Walkability

It is a measure of how friendly an area is to walking. Walkability has health, environment and economic benefits. In 2014 ,Chennai scored low on the walkability index with an average of 40 (out of 100) among the different land use types, with public transport terminals scoring the least with 35 and commercial areas with 42 the highest. Below shows a pie chart stats of air pollution by different modes in chennai [2]. According to below chart it is clear that the todays road air quality is not suitable for pedestrians.



1.2 Road Network

India has the world second largest road network of about 59, 03, 293 kilometres as on 31st January 2019 [3], adjusted for its large population, India has approximately 4.63km of roads per 1000 people [4]. As of march 2016, India had about 1, 01,011 km of national highways and 1, 76,166 km of state highway [3]. India’s road network carries over 65% of its freight and about 85% of passenger traffic [5]. It is clear from the above statistics, that road dust and air quality is the major issue for India because of high density of the road on which number of vehicle and corresponding air pollution increases every day.

Table- 1: National highway classification (As of 31 March 2016) [3]

Lanes	Length (km)	Percentage
Single Lane / Intermediate lane	20,703	20.49%
Double lane	55,603	55.05%
Four Lane/Six lane/Eight Lane	24,705	24.46%
Total	101,011	100%

2. AIR POLLUTION

Air pollution means the presence in the indoor atmosphere of one or more contaminant, such as dust, fumes, gas, mist, odour , smoke ,or vapour , in quantities, with characteristics, and of durations such as to be injurious to human, plant, or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life and property [6].

3. SOURCE OF AIR POLLUTION ON ROADS

In the road, air pollution is common now days because of continuous increase of vehicle, decreases the quality of air on the road. Below is some major source of air pollution on the roads.

- Exhaust gas emission from the vehicle and consider as mobile source.
- Friction of tyre to the road suspends rubber particle on road.
- Deposition of dust from outside on the road.
- Metal particle suspended on the road from the vehicle parts erosion etc.

4. EFFECT OF ROAD AIR POLLUTION

[7] Air pollution is one of the greatest environmental evil.

4.1. Effect on human

[7] The air we breathe has not only life-supporting properties but also life damaging properties. An average man breathes 22,000 times a day and take 16 kg of air each day. It far exceeds the consumption of food and water. Some effect of these is as follow

- Eye irritation for pedestrians and riders.
- Nose and throat irritation.
- Asthmatics problem.
- Dust particle cause respiratory disease etc.

4.2. Effect on plant

[7] Suppressed growth of the plant and leaf bleaching type problem is happen.

4.3. Economics effect

[7] Air pollution damage to a property is a very important economic aspect of air pollution. Some economics damages are

- Wear by dust particle damages the paint and parts of vehicle.
- Dust deposited on the road surface reduces the life span of the tyres generally form cracks on the rubber
- Makes scratch on glasses of the vehicle when long time exposure.
- Laundering and dry cleaning problems.

5. CONCLUSIONS

From the above discussions it is clear that, in India because of long road network air quality of the cities is mostly depends on its roads air quality. So if we control air pollution (mostly dust) on the road and restrict it to spread away from the road, then we will highly improve our global as well as India's air quality and get benefit in both the aspect health and economics. My concept is completely supports the Indian government scheme for clean environment "*Swachh Bharat mission*"

6. REFERENCE

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