Air Pollution in Mega Cities of India

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Urbanization is a global phenomenon experienced by economically advanced as well as developing countries. Rapid population growth, industrialization, urbanization, crowded housing conditions, inadequate civic amenities and solid waste mismanagement in mega cities are adversely affecting the environment. More than one fourth of Indian population is living in cities, out of which nearly one fifth is residing in four mega cities. With the increasing urbanization along with a conglomeration of industries and commercial activities in the cities, the transport demand has also increased consequently. Rapid and uncontrolled growth of population and the unplanned growth of mega cities in India have led to the problems of increasing slums, vehicular traffic and air pollution. Automobile exhaust is a significant source of air pollution in the urban context. Air pollution is one of the serious problems faced by the people globally, especially in urban areas of developing countries. The mega cities of India are affected by environmental problems, not the least of which is deteriorating air quality. All these in turn lead to an increase in the air pollution levels and have adverse effects on the health of people. What is more concern, the air quality guidelines of World Health Organization (WHO) are regularly being exceeded in Indian mega cities in some cases, to a great extent. Indian mega cities are among the most air polluted cities in the world and paying heavy health and economic price for it.

The present paper is an attempt to examine the effect of vehicular emissions on air pollution and to examine the extent of problem and suggest remedial measures. The data have been collected and analyzed from various secondary sources of data and conducted an analysis of changes and trends. Analytical and statistical techniques have been used for interpretation and data representation.

The analysis reveals that overall population in mega cities of India is growing much faster. The population living in four mega cities increased more than four times. The total population of all the four-mega cities increased by more than 3 per cent per annum during the first 3 decades and it declined afterwards. About one fifth of vehicular population in India is concentrated in four mega cities. The total registered vehicles in mega cities has increased manifold and varies from one mega city to another. In just one decade, the number of vehicles in mega cities has increased by five times. Another distinctive feature of the vehicular population of mega cities in India is the fact that 63 percent of the vehicles are two and three wheelers, which are mostly two-stroke engine driven, while diesel and petrol driven vehicles with four-stroke engine constitute only 37 percent of the total. Out of the total number of vehicles in four mega cities

55.6 percent are registered in Delhi, 19.5 percent in Chennai, 15.3 percent in Mumbai and 9.5 percent in Kolkatta. Compared to private vehicles the number of buses in the mega cities is still very low. More importantly the infrastructure for public transport is also limited. Poor infrastructure and limited capacity have actually forced urban users to shift to private modes of transport which are financially and environmentally more expensive.

A reduction in per capita road length is observed as city size increases excluding Chennai. With a few exceptions, there is a decrease in the ratio of road length to area as city size increases. There is also an increase in the passenger car units (PCUs) and an increase in number of PCUs per km. of road length as the city grows. These imply that improvements in road structure have not been in tune with the growth of the vehicles. The situation was much worse in the 1990s as compared to 1980s. PCU per 1000 population has increased by more than 2.5 times in Delhi, Mumbai and Calcutta. Delhi has recorded the highest increase. Per capita road length has decreased. More importantly, the number of vehicles per km. of road has tremendously increased, with Delhi registering five-fold increase. The rapid growth of personalized transport in Indian cities gives rise to serious congestion problems. Despite legislative and institutional frameworks and pollution control statement, there is little change in the air pollution, which continues to worsen rapidly over time.

Delhi has the highest vehicular emission load, followed by Mumbai, Kolkatta and Chennai. Among the pollutants, carbon monoxide emission was found to be the maximum. Two-stroke vehicles (two/three wheelers) were found to be major contributors of carbon monoxide (CO) emissions. Suspended particulate matter (SPM), sulfur dioxide (SO2), oxides of Nitrogen (NOx) and Hydrocarbons (HC) together constitute a substantial portion of total vehicular emissions in mega cities of India. Of the total air pollution load from various sources, vehicular pollution contributes to a shocking 64 percent in Delhi, 52 percent in Mumbai and 30 percent in Kolkatta. Vehicular air pollution is the result of a combination of bad vehicular technology, poor fuel quality, poor vehicular maintenance and non-existent traffic planning. Air quality in particular has suffered the worst and vehicular emissions have been identified as the main culprit. Air in mega cities has become highly polluted and pollutant concentrations exceeds limit considered safe by the World Health Organization. .

Air pollution in mega cities is one of the greatest menaces to the health of people, which in turn causing threat to the survival of mankind. The considerable magnitude of air pollution pulls up the number of people suffering from respiratory diseases and many a times leading to deaths and serious health hazards. There is a need to control population growth and vehicular air pollution in the mega cities of the country. Special efforts should be made for educating the general mass and local leaders about the

adverse effects of large population and vehicular pollution through specially designed information, education and communication (IEC) activities. While it is not possible to reverse the growth of cities, emissions from vehicles should be brought down if we want to control the effects of air pollution on health. Upgrading the quality of Indian fuel, enforcing higher emission standards and regulating traffic can reduce the pollution caused by the explosion in the number of automobiles in mega cities. Measures to control air pollution should be intensified. A shift in the movement of personal vehicles should be encouraged to public transport bus system. State transport bus service sector should set up better vehicular standards and more research and development should be encouraged in vehicle technology. The air pollution should not be a responsibility of government alone but mass and local leaders should be encouraged to make dedicated efforts to eradicate the air pollution problems. The policy aimed at overall development should certainly include efforts to control population, private vehicles and air pollution for better health of present and future generation.