

REPORT NO:R1

**A
REPORT
ON
THE STUDY OF CAUSES AND EFFECT OF
AIR POLLUTION
IN THE URBAN AREAS
IN NEPAL**

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**MINISTRY OF ENVIRONMENT
SINGHADURBAR, KATHMANDU, NEPAL**

09TH

JANAURY, 2013

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ABSTRACT

Air pollution is the degradation of the quality of air due to mixture of harmful substance such as dust smoke, harmful gases like CO₂, SO₂ etc. in the atmosphere. Air is very much essential ingredient for all life forms and its pollution has led to several adverse effects onto them.

The population is very dense in urban area and there are several factors for producing of air pollutants in such regions. There has been the rapid increase in number of vehicles annually, resulting into the regular traffic problems. Similarly, the improperly constructed industries brick kilns and the household stoves are

aiding air pollution. This increase in air pollution is declining the quality of life of the people and causing several respiratory diseases such as lung cancer, bronchitis, asthma, throat infection etc.

The air pollution can be reduced by discouraging the petrol/diesel engines and instead, promoting the solar, bio-gas, electric vehicles. Further, Effective traffic management should be employed and public awareness should be provided to the people about the causes and effect of air pollution.

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1. INTRODUCTION

Air consists of mixture of different gases forming the atmosphere around the earth surface. It comprises 78 percent nitrogen, 21 percent oxygen, 0.9 percent argon, 0.03 percent carbon dioxide, and the remaining 0.07 percent is a mixture of hydrogen, water, ozone and other inert gases. Air is an essential ingredient for survival of different life forms and various physical activities. Oxygen is necessary for plants to prepare food by the process of photosynthesis, for animals and human being to convert the food we have ate into energy to perform day-to- day activities and also for combustion of fuel .Similarly, Nitrogen gas is used by different bacteria to continue the nitrogen cycle.

Air pollution is the addition of harmful substances in air which degrades the quality of air and causes adverse effect in the life of living beings. It mainly occurs due to increase in pollutants such as the dust particles, carbon dioxide, carbon monoxide, Nitrogen oxide, Hydrocarbons, CFCs and other harmful elements in

the air. The increase in population in the urban areas of Nepal in last decade has drastically leaped the level of air pollution.

1.1 Background

Air pollution has become a major issue in today's world. With the increase in Human population, there has been tremendous increase in the rate of deforestation, leading to the barren fields. For the sake of the luxurious life, people have been using the personal vehicles. Furthermore, they use ACs, refrigerators, heaters which secrete harmful gases. Also, the increasing number of industries releases the harmful and toxic gases to the environment and has aided the pollution. The increase in the accumulation of greenhouse gases in the atmosphere has caused the Global warming and causing slow and steady increase the temperature of Earth. Furthermore, these gases have caused the depletion of the Ozone layer, inviting the harmful solar radiation and ultraviolet rays to earth surface. The condition of air pollution is has been intensified in the urban areas like Kathmandu, Pokhara, Butwal, Biratnagar, etc. due to concentrated developmental projects and rapid internal migration.

1.2. Objective of Study

The main objective of this report is to present the condition of air pollution, its cause and effects in urban areas of Nepal.

1.3 Methodology

The data collected in the report are of following types:

- a. Primary: These data were collected by preparing questionnaires to the local people of urban areas like Kathmandu, Pokhara, Birgunj, etc.
- b. Secondary: These data were collected from the secondary source such as government, non-governmental agencies etc.

1.4 Scope and significance

Air Pollution being a burning issue in the present world, this report will provide the condition of air pollution and make a small effort to provide the data on air pollution. It can also be used as reference material for the further study and to launch a better project to reduce the air pollution in the urban areas of Nepal.

2. DESCRIPTION

2.1 Causes of Air pollution

Combustion of fuel is one of the major causes of air pollution in urban areas. Burning of fossil fuels such as natural gas and gasoline lead to the emission of carbon dioxide and other gases, which deteriorated the quality of air, thus making it polluted. With increase in population, the vehicles in urban areas are increasing rapidly and are expected to double in next decade. These automobiles such as tempos, cars, scooters, taxis, trucks, bikes, etc. release huge amount of the poisonous gases like carbon monoxide, nitrogen oxide, etc. in addition to particulate lead. Furthermore, the industries like brick kilns have resulted in the emission of several greenhouse gases. The chloro-fluorocarbons (CFCs), a class of synthetic chemicals used in refrigerants and aerosol propellants, have caused hole in Earth's ozone layer. The Smog ($\text{SO}_2 + \text{CO}$) is very toxic in nature and has contaminated the Earth's atmosphere leading to acid rain. Air pollution was partially caused by the dust, waste materials, etc.

2.2 Effects of air pollution in urban areas.

Due to intense population in the urban areas the effect of air pollution was even severe. Some of the effects of air pollution on human health were as follows:

1. The quality of air becomes very low for the human to respire.
2. Asthma, a chronic disease is found to be a common among children and adults living in urban areas.
3. The inhalation of polluted air has caused Lung infection in several people that can lead to the lung cancer.
4. Air pollution has resulted in blockage in the coronary artery or blood vessels that supply blood to the heart risking the chances of heart attack.
5. High level of pollution in the air has caused irregular rhythms of heartbeat and is also leading to heart failure.

Kathmandu's leading expert in effect of air pollution, Dr. B.P. Pandit, says the diesel fumes are causes of cancer. He adds that such gases destroy the respiratory system, causing the lungs cancer. The excessive inhalation of CO can even lead to the death. In the Kanti children hospital, more than 600 patients visit daily, among which more than 40% have respiratory problems. Furthermore, the air pollution has aided to the global warming and green house effect, causing the rise in temperature of the earth and melting of the glacier. This has further caused the commence of flood landslides and many more disasters.

The Department of Physics group, IOE, Pulchowk Campus, has also used Nephelometer, Telephotometer and air borne particulate to study the air pollution in the Kathmandu Valley. The trend of diurnal variation is in a sharply increasing order. The visibility measured in the 2006 ranged between 7.1 km to 99.6km. In 2008, it ranged between 5.8 to 17.5 km and only 2 to 5 km in 2011. Similarly, the mass concentration of several major cities in Nepal is higher than the WHO set standard, which is aiding air pollution.

3. CONCLUSION

Air pollution has become a major problem in the urban area. The increase in the pollutants has declined the quality of the city's environment and difficult to survive for the local people. People are getting ill and their life expectancy rate is decreasing. It has caused negative image in tourism industry thus, hampering one of the major sources of Nepal's economy. Thus, the ultimate time has arrived for all the citizens to work together hand in hand to reduce air pollution and make our environment clean, green and healthy for us and for our future generation.

4. RECOMMENDATION

Controlling the air pollution means to keep the balance of air constituent .The following measures can be adopted to control air pollution:

- We should encourage the use of solar energy as an alternative source.
- Vehicles should be regularly checked, labeled and old vehicles that emit more harmful gases should be restricted.
- Promotion of cycling, bio-gas and electric vehicles should be done.
- Effective traffic management, practice of engine idling for stationary vehicles, and encouraging people to ride public vehicles.
- Public awareness should be generated among the local people about the Causes and effects of the air pollution.
- Development of industries should be delocalized and monitored carefully by government. Environmental rules must be passed regarding the emission of gas particles from the industries.
- Afforestation should be done in large scale.
- Inclusion of subjects like health population and environment in the school and higher level studies.

5. BIBLIOGRAPHY

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6. GLOSSARY

1. Atmosphere`	:	Mixture of Air
2. Combustion	:	Burning, ignition
3. Commence	:	Begin
4. Emission	:	Release, discharge
5. Photosynthesis	:	Process by which plants prepare food
6. Pollutant	:	Impurity

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