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## IMPACT OF URBANIZATION ON ENVIRONMENT

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### ABSTRACT

Since the arrival of the man on the earth, the environment is attached with him. Both are integral part of the natural phenomenon.

The word 'environment' has been derived from the French word 'environner' means to encircle or to surround. The dictionary meaning of the word 'environment' is a surrounding; external conditions influencing development or growth of people, animals and plants, living or working conditions etc.

According to C. C. Park (1980), "Environment refers to the sum total of conditions which surround man at a given point in space and in time".

Urbanization refers to general increase in population of cities or expansion of the cities either through migration from rural areas to urban center or the increase in population of urban centers.

Increasing urbanization means phenomenal increase in the concentration of human population in limited space which results in the increase of buildings, roads and streets, sewage and storm drains, vehicle population, number of factories, urban wastes, aerosols,

smokes and dusts, sewage etc. which cause several environmental problems mainly air and water pollution and garbage hazard.

**Present paper throw a light on following points –**

- 1) Urbanization and environmental degradation.
- 2) Urbanization and environmental pollution.
- 3) Urbanization and heat island.
- 4) Urban smog.
- 5) Global warming.

**KEYWORDS:** Environment, Urbanization, environmental degradation, environmental pollution, heat island, urban smog, global warming.



## INTRODUCTION :

Man is an important part of the biotic component of the environment and simultaneously he is also an important factor of the environment. Thus man plays important roles in the natural environmental system in different capacities such as biological or physical man, social man, economic man and technological man. All the natural functions of human beings such as in birth, growth, health and deaths are affected and determined by the natural environment in the same manner as in the cases of other organisms but man being most developed and advanced animal, both physically and mentally and hence technologically, is capable of making substantial changes in natural environment so as to make it suitable for his own living. The role of most primitive biological or physical man in the functions of natural environmental system was fundamentally that of user of environmental resources and thus he played the role of a factor of the environment but as the skill and technology of man developed with cultural development his roles towards natural environment also changed progressively such as from user through modifier and changer to destroyer of the environment.

It is the technology of man which has drastically changed the man – environmental relationship from prehistoric period to the present most advanced industrial period. Industrialization and urbanization has created the problems such as slum formation, health hazards, environmental pollutions, nuclear hazards, solid waste management problem, global warming, problems related to energy.

In the present paper impact of urbanization on environment is discussed through following points.

### 1) Urbanization and Environmental Degradation :-

Increasing concentration of population in urban centres and origin and expansion of new urban centres due to industrial expansion and development are responsible for rapid rate of exploitation of natural resources and several types of environmental degradation and pollution in the developed and developing countries. The level of urbanization in the developed countries of the world has already reached its peak. The accumulation of wealth and availability of more economic and job opportunities in the urban centres have resulted into the concentration of population in the congested metropolitan areas and thus the formation and growth of big slum areas.

Urban Centres when combined with industrial sectors become more hazardous from the standpoint of environmental degradation and pollution. Huge quantity of aerosols and gases is emitted from 'human volcanoes' and vehicles which form 'dust domes' over the cities. These 'dust domes' cause 'pollution domes' over the cities. The urban and industrial growth has resulted into rapid rate of deterioration of the quality of air because of heavy pollution of air through gases and aerosols emitted from the vehicles, factories and household appliances.

The industrial cities such as Mumbai and Kanpur register higher level of air pollution as the air has become highly polluted and toxic. The danger of acid rains because of increasing proportion of oxides of nitrogen and sulphur in the air is increasing. It is found that the level of sulphur in the air over Indian cities is very high. About 1,700 pollutants are mixed with the air every day over Mumbai metropolitan area. Out of these 55 percent are emitted by the vehicles. The polluted air in Mumbai causes chest pain, cough, irritation of eyes and respiratory problems.

Increasing urbanization also modifies the water budget of surface water as well as ground water. Increasing urbanization increases the frequency and dimension of floods of nearby streams because the covering of ground surface by pucca structure reduces infiltration of rain water and increases surface run – off. Moreover, the masonry storm drains quickly dispose off surface run – off nearby streams. Urban Centres also modify the local and regional radiation and heat balance through the creation of heat island and pollution dome.

Increasing urbanization increase pressure on groundwater resources for the supply of water for domestic and industrial uses. Excessive withdrawal of groundwater results in the formation of large cavities below the ground surface. The development of such cavities causes the collapse of ground surface and thus inflicts great damage to human health and wealth.

### 2) Urbanization and Environmental Pollution :-

According to 'Natural Environment Research Council' (NERC) 1976, pollution is viewed as "The release of substance and energy as waste products of human activities which result in changes, usually harmful within the natural environment".

Increasing concentration of population in urban centres and origin and expansion of new urban centres consequent upon industrial expansion and development and employment potential are responsible for rapid rate of exploitation of natural resources in transformed forms and several types of environmental problems. The accumulation of wealth and availability of more economic and job opportunities have resulted into the concentration of population in the congested metropolitan cities and thus the formation and growth of slum areas in India. Increasing urbanization has caused serious air pollution, water pollution, noise pollution, marine pollution, thermal pollution.

Environmental pollution is reaching worrying proportions worldwide. Urbanization and industrialization along with economic development have led to increase in energy consumption and waste discharges. Environmental pollutants have various adverse health effects from early life some of the most important harmful effects are prenatal disorder, infant mortality, respiratory disorders, allergy, cardiovascular disorders, increase in stress oxidative, skin disorders, ear infections, eye infections, blood disorders etc.

Thus urbanization causes environmental pollution and pollution produce adverse effects on health of urban society.

### 3) Urbanization and Heat Island :-

The process of urbanization a man-induced phenomenon, results in the transformation of mostly natural landscape of a richly vegetated countryside into the development of cities and towns characterized by concretionary structures which greatly modify the pre-existing climatic conditions of the countryside of the pre-urbanized stage. Thus 'A city generates its own distinctive climate'. The various factors of well developed city of fairly a large size viz. density of buildings, height of buildings, size of city, size of human population, breadth of roads and streets, nature of storm drains, open unbuilt spaces, nature of urban vegetation, topography and other environmental conditions of the surrounding countryside or rural areas, level of industrial development of the concerned city, nature and amount of pollutants in the city atmosphere etc. modify the climatic condition of a city and thus generate a typical 'urban climate'. The urbanization affects the local climate through the formation of heat island, changes in the patterns of air flow both horizontal and vertical, creation of pollution dome above the city, alteration of urban hydrological regime etc.

The process of urbanization changes the radiation and heat balance at local level which becomes regional in character when the effects are extended to larger areas mainly in big industrial belts. The higher temperature in the CBD (Central Business District) or the city center (known as 'chowk' in Indian cities) is very often called as urban heat island or simply a heat island.

It may be pointed out that the temperature decreases slowly from the city centre towards the outer parts of the city but at the boundary of the city and the countryside there is sudden drop in the air temperature. The heat island becomes most pronounced at night because the temperature difference between the city centre and the rural surroundings or countryside is normally 6°C in most of the large cities but some times the difference of temperature becomes 12°C or even more. 'The magnitude of the urban heat island shows a clear relationship to city size and to wind speed. The larger the city the stronger the winds which are necessary to dissipate the heat island effects'. (T. R. Oake and F. G. Hannell, 1970).

Urban heat islands can have worse air and water quality than their rural neighbours. Urban heat islands often have lower air quality because there are more pollutants (waste products from vehicles, industry and people) being pumped into the air. These pollutants are blocked from scattering and becoming less toxic by the urban landscapes : buildings, roads, side walks and parking lots.

Scientists are studying how urban heat islands might contribute to global warming, the most recent climate change pattern that includes the gradual warming of the Earth's temperature.

### 4) Urban Smog :-

Smoky fog over the cities and industrial areas is generally called as smog or urban smog. Smog is generally formed when fog is mixed with smoke. When smog is mixed with air pollutants such as sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>) and ozone (O<sub>3</sub>), it becomes poisons and deadly health hazard to human beings sulphur dioxide is the main culprit in the formation of smog. It readily combines with atmospheric oxygen (O<sub>2</sub>) and reacts



with water films on suspended particulate matter (SPM) to produce sulphuric acid (H<sub>2</sub>SO<sub>4</sub>). This sulphuric acid after combining with smog makes it poisonous. Ozone after reacting with hydrocarbon compounds forms some toxic compounds such as ethylene which is a common pollutant in urban smog. It may be pointed out that these air pollutants (sulphuric dioxide, nitrogen oxides, ozone etc.) are trapped in a shallow layer over the cities caused by inversion of temperature (warmer air over cooler air) and thus are mixed with fog having poisonous air pollutants is called urban smog and is highly undesirable weather phenomenon for society.

### 5) Global Warming :-

The most significant global environmental problem faced by the world community is related to Global Environmental Changes (GEC) consequent upon global warming resulting from a host of causal factors mainly anthropogenic factors such as changes in atmospheric chemistry, ozone depletion, emission of greenhouse gases at alarming increasing rate, urbanization, land use changes mainly deforestation etc. The probable net result of global warming and changes in atmospheric chemistry through air pollution and other natural sources would be climatic changes at local, regional and global levels including both short – term and long – term changes in weather and climate.

Global warming refers to gradual rise in atmospheric and ground surface air temperatures and consequent changes in global radiation balance caused mainly by anthropogenic processes (although natural processes also cause global warming and cooling) leading to climatic changes at different levels (e.g. local, regional and global levels).

Urbanization is the main anthropogenic factor causing global warming. Urbanization causes an increased enhanced greenhouse gas effect, resulting in global warming. Urbanization refers to the movement of people from rural areas to cities. This results in an increase in the population of the cities, thereby placing a strain on its resources, causing it to expand. An average urban household emits 100 Kg. of carbon more than a rural household annually. This means that there is a greater emission of greenhouse gasses like carbon dioxide. Moreover, as more people move to cities, a greater amount of land is needed to build houses. This means that the city will have to use much more energy in terms of providing a better form of public transport and more amenities. Also, they would have to use more money and energy to build homes for the newcomers. All these activities result in an increased emission of greenhouse gases. With increased affluence, people in cities invest in automobiles, air conditioning or in basic amenities like refrigerators or televisions. These appliances are what is normally known as energy guzzlers. That means that the city as a whole emits much more greenhouse gasses and this results in an even greater enhanced greenhouse gas effect.

Thus global warming can be explained in simple words as the increase in temperatures of the lower layer of the atmosphere. Greenhouse gases like carbon dioxide have the capacity to hold the outgoing energy in terms of heat, released from the surface of the earth. Even the water – vapour in the atmosphere has the capacity to hold the heat released from the surface of the earth. Due to these reasons the temperature on the surface of the earth gradually increase which is known as global warming. Industrialization and urbanization are the major causes of global warming.

### • CONCLUSIONS :-

- 1) Urbanization has negative impact on environment.
- 2) Urbanization causes environmental pollution, global warming, climate changes, problems related to energy, solid waste management problem.
- 3) Environmental problems produce adverse effects on human life and health conditions.

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