

**ENVIRONMENTAL ISSUES AND CHALLENGES IN INDIA**

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**ABSTRACT**

Man has made natural environment more hospitable through rapid advancement in modern sciences, technology and medication. He has crossed all ecological borders and disrupted the fragile intricately woven web of life. As a result he is facing increasing and continuing death and destruction from the environment which he has disturbed. The pollution in the environment adversely affects the health and ill health affects the academic, economic, social development of a person. The environmental pollution generates the various types of communicable diseases and ultimately deaths. Thus, to prevent the people from these morbidities the environmental education is required regarding cleaning, hygiene, sanitation and preventive measures.

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**Introduction**

The natural environment comprises of all the resources-soil, water, air, plants, animals, minerals *etc* as well as the social and socio economic cultural rules and customs. The optimum levels of these resources are the positive sign of the overall development of a person, family, society and nation.

The internal environment of a man pertains to "each and every component part, tissue, organ and organ-system and their harmonious functioning within the system<sup>1</sup>". The external factors consist of living and non-living, material and non-materials which surround people and it is the combination of their components *viz.*(1) physical (2) biological and (3) social<sup>6</sup>. National sanitization foundation USA has defined that sanitization is a way of life; quality living that is influenced by the clean home, the clean farm, the clean business, the clean neighbourhood and the clean community<sup>5</sup>.

As per WHO environmental sanitization<sup>9</sup> is the control of all those factors in man's physical environment which exercise deleterious effect on

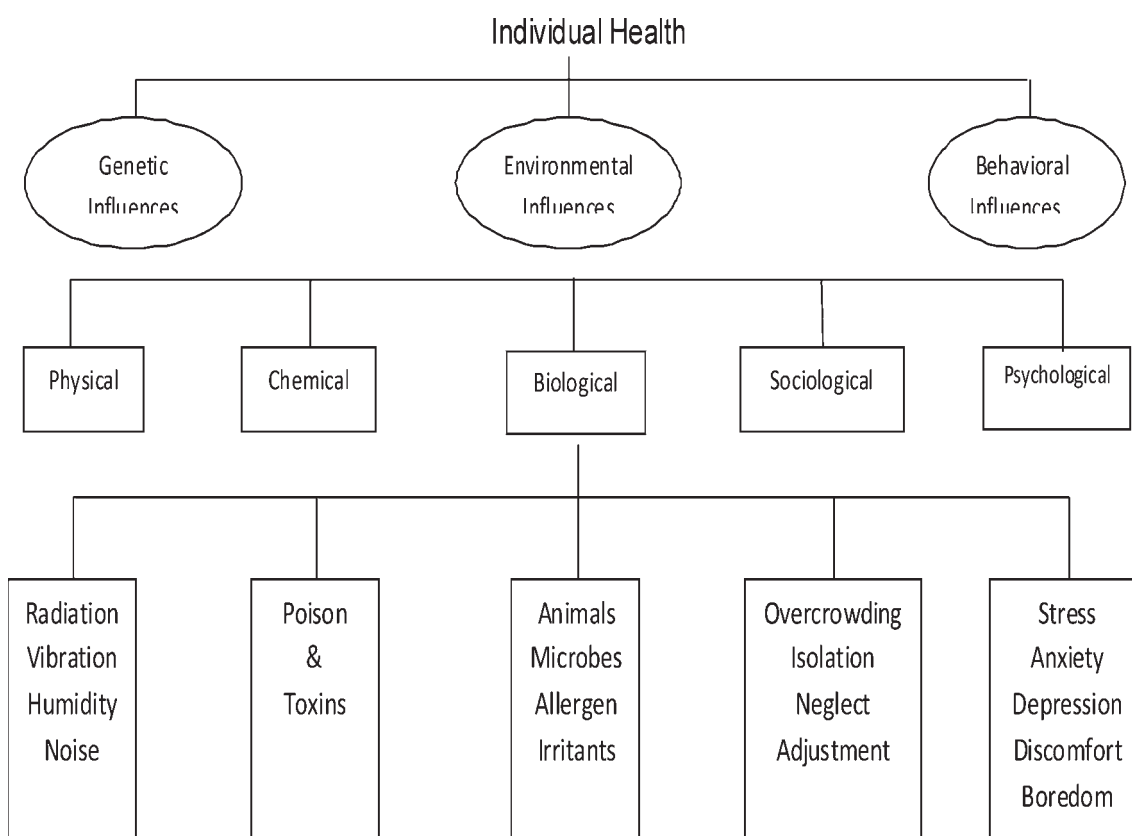
his physical development, health and survival. The quality of our air, water and land is being seriously undermined by the hundreds of millions of tons of toxic wastes that our industries and automobiles dump into the earth, water and air each year.

The increase in industrial growth has tremendously improved the economic condition of the individuals as well as nations but simultaneously it also increases the industrial waste which increased the pollution. The environmental problems in urban areas are many and are broadly the outcome of modern consumerist culture- industrialization and overcrowding, deteriorating conditions in law and order situations, *etc*. Urban areas have a unique culture which is made up of continuous efforts to expand and grow in volume and size, and progress rapidly into a modern society. The socio-economic status is of great importance in urban areas and hence the tendency to relentlessly exploit all available resources be it natural resources, human resources or man-made resources. This process attracts huge population from villages who settle here in hope of better facilities and security. As the urban population grows, life support system gets

overstressed leading to environment problems. In urban areas due to huge population growth and industrialization, pollutants are just about everywhere. Pollutants pose a direct threat to man's environment, they are found in the air that is breathed, water that is drunk, food that is eaten and sound that is heard. In this research article environmental influences and factors affecting environment will be discussed. The problem of radio-active pollution of the environment has been increased by the enhancement of nuclear technology while the uses of nuclear technology in the various fields of our life have made more comfortable our life but the excursion of green house gases adversely affected our good health. The proper environment of health now required the services of the public health qualified doctors, the epidemiologists, the public health engineers, town

planners, the sociologists, the economists and the health inspectors. A combined multi-disciplinary programme of action is needed to achieve health environment<sup>1</sup>.

There is well-known fact that environment affects on health, developments *etc.* The indicators of household environment (water, air, soil) highlight the level of this environment. The bad environment affects the increase in prevalence of infectious diseases, childhood morbidity and mortality. According to WHO unsafe water and hygiene, indoor smoke from solid fuels, urban outdoor air pollution, lead exposure and global environment changes *etc.* are included as major risk factors<sup>10</sup>. The effects of those risk factors are tuberculosis respiratory diseases, lung cancer, COPD, diarrheal diseases, hypertension and cardiovascular diseases *etc.*



**Environmental Influences:**

Environmental influences on health are physical, chemical, biological, sociological and psychological.

**Factors affecting the Environment :**

The environmental education is essential, for the community to prevent them from various health problems caused due to environmental sanitation. These environmental factors are mainly water, air, ventilation, noise, temperature, housing, disposal of wastes, medical entomology, toxicity of insecticides *etc.*

**Water:**

Water is a renewable resource, however, its availability in time and space is limited. Its availability is largely decided by climate, geographical and physical conditions, by affordable technological solutions which permit its exploitation and by the efficiency with which water is conserved and used. Water is the most important element in the biosphere and it is essential for the existence of all forms of life on earth. All plants and animals in a given physical environment are closely interlinked and interdependent, they cannot exist without each other. In their eco-system, their vital connecting factor is water. Human activities and economic development are dependent upon water.

Earth is referred to as a watery planet as three-fourth of it is covered by water. Then what it is, that makes it precious and highly vulnerable gift of nature. If we compare the total water on the earth to be a bucket full, there is only one spoon full of water usable to us. Now we can imagine how careful we must be with our water resources. Of the three major uses of water that is domestic, agricultural and industrial, agricultural is the greatest consumer of water and has been to a great extent responsible for its overexploitation, leading to its depletion in many parts of the world in response to the green revolution. Agriculture accounts for 65 percent of the total water consumption in the world. Industries consume 25 percent and 5 percent is used for domestic purpose. In India about 96 percent is consumed by agriculture, 3 percent by industries and 1 percent by domestic use.

The growing demand of water in India has led it to overexploit the rivers to fulfill needs. As a result some rivers have reduced in volumes drastically. The growing population and rapidly growing development has accelerated the demand

and use of water.

As a result our water resources are highly stressed even in the humid regions. The strain is more acute because of the deterioration of the quality of water brought about by agriculture and industry. Fertilizers, pesticides, chemicals and other waste mix up with the water polluting it.

Construction of dams has affected our rivers, though they have economic advantages, like providing electricity, navigation, controlling floods, providing irrigational facilities. They destroy the natural flow of the river and alter ecosystem of the basin. They also cause large scale siltation.

Cause for the depletion of water resources :

- ∇ Increase in demand for water, due to rapid increase in population and development.
- ∇ Bad water management – India receives heavy rainfall, though the bulk of its falls within the short monsoon period of four months, draining a total volume of about 400 million ha.mtr. Of this, only 100 million ha is retained in the soil and the rest is carried off to the seas and oceans.
- ∇ Poor ground water resources due to deforestation and overgrazing which result soil erosion and inability of the soil to permit water infiltration.
- ∇ Poor storage facilities and a careless attitude toward conservation.
- ∇ Overexploitation of ground water.
- ∇ Dumping of various kinds of pollutants our water bodies and reducing the usability of available water.
- ∇ Evaporational loss of water stored in large reservoirs and loss by seepage in long system.
- ∇ Siltation of bodies of water due to degradation of vegetation of cover in the hill and catchments areas.

In 1980, the UN General Assembly launched the International Drinking Water Supply and Sanitation Decade 1981-1990, to provide safe water and sanitation to all human beings.

The safe and wholesome water is defined as:

1. Free from pathogenic agents.
2. Free from harmful chemical substances.
3. Free from colors and odours.

#### 4. Usable for domestic purpose.

About 2 litre drinking water per day per head has been the basic physiological requirement for just survival. An adequate supply to meet the needs for urban domestic purposes is considered as 150-200 litre per head daily is compared to 40 litres for rural areas. The main sources of water are rain, surface water (rivers, streams, tanks, ponds & lakes) and ground water (shallow wells, deep wells and springs).

Uncontaminated water does not occur in the nature. The natural impurities are not essentially dangerous and these are dissolved gases (e.g. nitrogen, carbon dioxide, hydrogen sulphide etc.) which may be picked up during the rainfall. Human activity, urbanization and industrialization are the more serious causes of water contamination. Water pollution can be measured based on the amount of total suspended solids, biochemical oxygen demand at 20°C concentration of chlorides, nitrogen and phosphorus and absence of dissolved oxygen. Due to pollution of water some water-borne diseases occurs (e.g. viral, bacterial, protozoan, helminthic, leptospiral snail and cyclopes). Besides above some other health problems (e.g. dental health cyanosis in infants, cardiovascular diseases, transmitted nature diseases, disease carrying insects) are also occurring due to chemical pollution in the water.

#### Depletion of forests :

Increased urbanization, industrialization and mining have entailed indiscriminate felling of trees which has resulted in large scale denudation. This practice has been going on since centuries. For man forests are products to be exploited. Millions of hectares of forest land is under depletion. India alone is using more than 1.5 million h.a. of forest cover each year and 22 million hectares of forests are being destroyed during the last three decades due to overexploitation, misuse and their conversion into agricultural land. The depleted forest wealth would simply deprive man of economic and environmental values offered by forests.

Deforestation has caused depletion of large number of species and their natural habitats. About 10 percent of the species of flowery plants are threatened with extinction. In the next few decades more species may head towards extinction.

#### Wildlife:

According to Webster's dictionary "wildlife may be defined as living organisms that are neither human nor domesticated, especially mammals, birds and fish which are hunted by man." The Wildlife (Protection) Act 1972, also defines wildlife as "any animal, bees, butterflies, crustacean, fish, moth and aquatic and land vegetation which form part of any habitat". Wildlife resources provide aesthetics, recreational and economic benefits and at the same time have great ecological significance.

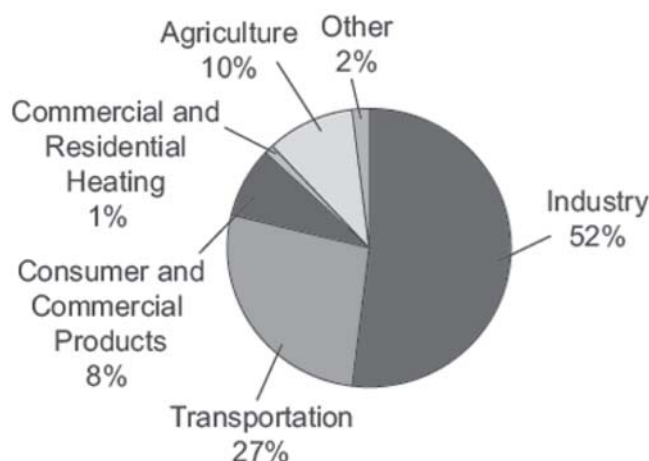


Fig. 1 : Reflects that the highest source of Air Pollution is Industry and lowest sources are Commercial & Residential Heating.

Nature's millions of forms of life on earth perform some of the definite biological functions which keep the delicate balance of our biosphere. In nature flora and fauna go hand in hand and one cannot exist without the other. Birds and insects are necessary for cross pollination of flowers and these with animals serve for the dispersal and propagation of vegetation. Not only this, the health of the vegetation also depends on the natural browsing and grazing. Needless to say that animals, directly or indirectly, depend on plants for food and shelter. Thus, wildlife plays an integral role in maintaining the ecological balance in nature.

Today most animal species of the world stand at the edge of extinction. Over 600 species are officially acknowledged to be endangered. Large animals are especially at risk from habitat destruction. Their natural population tends to be quite small, because each individual requires proportionately more territory.

#### **Air:**

Air is the mixture of gases. The normal composition of natural air is approximately 78.1% nitrogen, 20.93% oxygen and 0.03% carbon dioxide and balance covers other gases which occur in traces. Air is polluted mainly due to (i) Respiration of men and animals (ii) Trade, Traffic and manufacturing processes which produce dust, fumes, vapours and gases. The wind, sunlight, rain, plant life are self cleansing mechanisms in nature.

A person at rest gives an average off 0.7 c.ft of carbon dioxide per hour, which increases up to 2 c.ft during physical activity. A person at rest gives off heat output approximately 400 Btu per hour which increases up to 4000 Btu per hour during physical work. At rest an adult person releases an average 700 grams of water vapour per day in the form of perspiration. Vitiated air may negatively affect the comfort, health and efficiency of the occupants. The feeling of suffocation or discomfort, complaints of headache, drowsiness, inability to concentrate, risk of droplet infection and reduced resistance, coughing, sneezing and load talking.

#### **Air Pollution:**

Factors which are responsible for Air-Pollution may be shown through pie diagram (Fig. 1).

The three main types of automotive vehicles being used in our country are (a) passenger car powered by four stroke gasoline engines, (b) motor

cycles, scooters and auto rickshaws powered mostly by small two strokes gasoline engines and, (c) large buses and trucks powered mostly by four stroke diesel engines.

Emissions from gasoline powered vehicles are generally classified as (a) exhaust emission, (b) crank-case emissions, (c) evaporative emissions. The amount of pollutants that an automobile emits depends on a number of factors, including the design and operation. Of the hydrocarbons emitted by a car with no control, the exhaust gases account for roughly 65 percent emission from the fuel tank and roughly 15 percent from the carburetor with the crank case accounting for the rest of 20 percent emission. Carbon monoxide, nitrogen oxides and lead compounds are emitted almost exclusively in the exhaust gases. Diesel powered vehicles cause relatively lesser pollution problems as compared to gasoline powered ones. The diesel engine exhaust only about a tenth of the amount of carbon monoxide exhausted by a gasoline engine, although hydrocarbons emission may be more than these of the gasoline engine. Evaporative emissions are low because the diesel engine uses a closed injection fuel system since the fuel is volatile than gasoline. The major problems with diesel engines are smoke and odour.

Pollution<sup>3</sup> due to vehicular emissions is primarily intended to be controlled through changes in design and installation of suitable appliances right at the time of manufacturing of vehicle under section 20 of the Air act. The State Govt. in consultation with the State Board, has been empowered to instruct the regional transport authority to ensure that only vehicles in compliance under this section 20 are registered. Such instructions are binding on the state registration authority.

In relatively more polluted and higher traffic intensity regions, pollution due to automobiles can be controlled by restricting the use of certain kinds of fuels as empowered under section 19(3). Petrol mixed lead could be banned or in extreme cases, a ban on petrol or diesel driven vehicle can be imposed and instead only eco-friendly CNG can be used within certain areas.

It is the Indian way to compromise with space by saving long distance commuting. It is due to the general tendency of the people to be as near to service centers and work places, to save the

journey to the down town or to work and back. The core and the neighborhood become overcrowded. The upper class residential buildings of Malabar, Walkeshwar, and Lambala Hills of Mumbai seek the proximity to the city centers, which is not the characteristic of the West. It is wealthier and the higher class people in the city centers who are pushing the weaker sections and the lower class to the outskirts. In Indian cities, a large number of functional units having no fixed location or centers may use the street side or public places. The vendors or the bicycle retailers may temporarily use any piece of land in the open air, which is not even devoted to the business. To add to the confusion there is a squatter settlement of the poor as well as the migrant population, which crops up within a short time anywhere in the city's open spaces and turns, transforming it into a squalid slum. Such slums are also formed in the peripheral villages swallowed by the city's growth. The slum which is a world in itself is a unique kind of land use in India, apart from being a grave problem.

Another peculiar feature in Indian land use are historical vestiges, areas set aside for the British

residence and for the cantonment. The segregation of people in towns and cities is not like those of the western concept. India is based on caste and religion rather than on economical class, though it is very slowly giving way to a class based society at least in the big and new cities. Level of Air-Pollution in various cities of India may be shown through a graph :

#### Noise:

#### Control of noise:

It can be controlled through variety of approaches e.g. careful planning of cities, control of vehicles, by improving acoustic insulation of building, industries and railway, protection of exposed person, legislation and education.

#### Radiation:

Man is exposed by the radiation from time immemorial. The sources of radiation are natural (cosmic rays, terrestrial, atmospheric, potassium ( $K_{40}$ ), strontium ( $Sr_{90}$ ), carbon ( $C_{14}$ ) and man-made (X-rays, radio, isotope, occupational exposure, nuclear, television sets, radioactive dial watches, isotope tagged product, luminous markers).

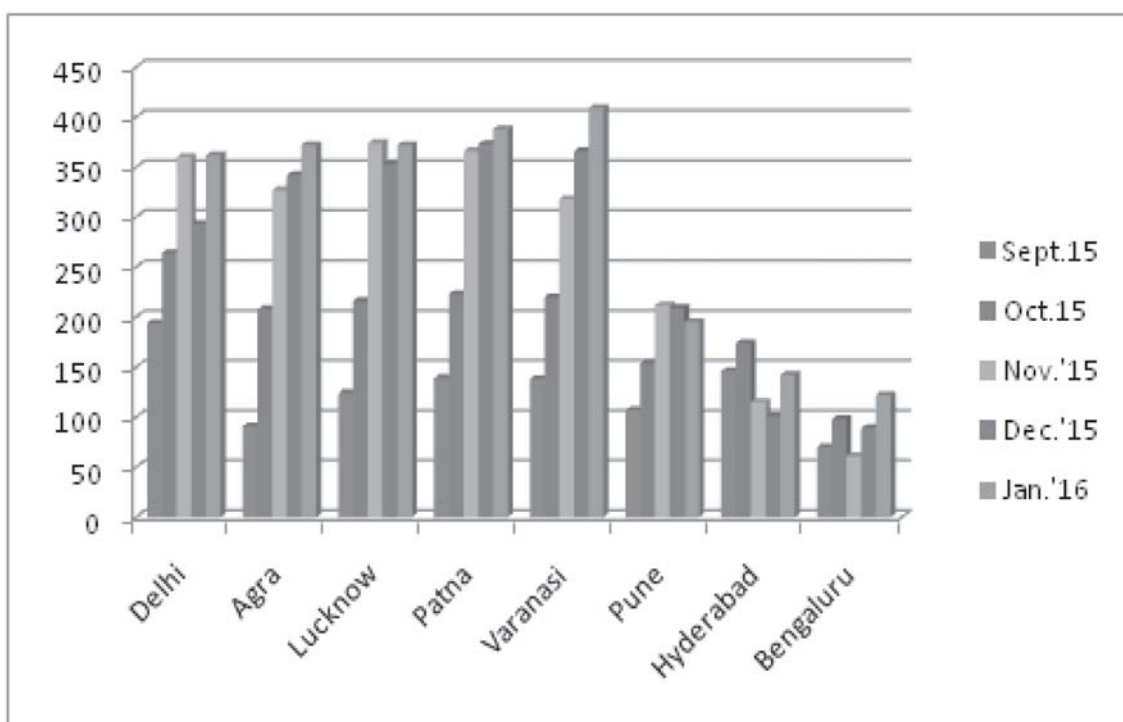


Fig. 2 : Reflects CPCB (Central Pollution Control Board) data for the September 2015 to January 2016 clearly shows highest Air Pollution level in Varanasi and lowest Air Pollution level in Bengaluru city.

The effect of radiation is divided in two separate groups<sup>2,6</sup> *i.e.* somatic effects (leukemia, malignant tumors and shortening of life) & Genetic effects (sterility & genes). Radiation protection is made by several national & international organizations.

#### **Climate:**

It includes atmospheric pressure, air temperature, humidity, rainfall, direction and speed of wind and movement of clouds and character of weather. Its extreme status also affects adversely to the biological lives.

#### **Housing:**

In India, there are two major aspects of the housing crisis. The failure of the government to view urban housing as a multidimensional process, which involves making provisions for several other needs apart from physical shelter is one aspect. There are big housing and infrastructural shortages which have steadily accumulated over the years and now is beyond any solution. The other aspect being that of the manner in which the urban poor have solved their problem in their own desperate manner by building clusters of hutments and shanties. Wherever, however they can. Thus resulting into slums, which are here to stay. Dharavi in Mumbai is Asia's largest slums, which spread over 4.5 s.q. kms of prime land in central Mumbai. This prime real estate where huts today fetch a price of 95,000/- sq meter was originally creek land where families of potters and tanners existed. Soon it got occupied by garbage, rag pickers, and scrap dealers, the encroachers occupied 2.5 sq kms of land belonging to the corporation and 1km belonging to private land owners and the government. This area has a stable population of over 3 lakhs and a floating population of 4 percent of Mumbai lives here. There are over 65,000 shanties, pucca and semi-pucca construction and each hut occupy an estimate average of eight persons.

#### **Waste Disposal:**

As man engages in the activities associated with living, wastes are produced. Wastes are products which have no apparent useful purpose or are not of much marginal utility that recovery is uneconomical. Such products include human, residential, agricultural, commercial and industrial wastes of all kind. Waste is generally identified as "something which is not put to proper usage at a given time". As population increases the amount of

waste generated also increases.

The accumulation and improper disposal of waste leads to environmental pollution and accelerates the spread of communicable diseases. Of the 52,000 tons of waste generated per day, only 2,832 tons of waste gets to be treated.

The continuous removal and safe disposal of these wastes is essential to the continuous existence of any community. If waste is not disposed off in a safe manner it endangers the citizen's health.

These wastes may be categorized into three major types:

1. Solid Waste
2. Liquid Waste
3. Gaseous Waste

Where wastes are water carried, pollution of water supplies may occur. Commercial of industrial liquid wastes may contain particulate and chemical pollutants.

Bodily discharges have always been viewed as hazardous to mankind. Intestinal diseases are readily transmitted if water or food gains, are contaminated directly or indirectly by human wastes. Such wastes also promote a medium for fly breeding.

Domestic waste production is the main problem in India. All cities and towns produce large amount of solid wastes whose disposal is the main problem. Every Indian generates about 250-300g, of waste per day.

Improper disposal of this waste results in diseases like diarrhea, malaria and even epidemics like plague. It provides a good breeding ground for vectors which carry fatal diseases.

Many activities of man such as driving an automobile, generating electric power, processing chemicals and petroleum, manufacturing certain products which are non-biodegradable or improper disposal of wastes, may lead to severe pollution.

Solid and sludgy wastes cover an entire range in disposal from more dumping to sanitary landfills. In most parts of the world, especially developing countries, planning and disposal of wastes is in a poor state.

Uncovered dumping areas can prove to be a health hazard. In some places local water bodies are commonly used as a means of waste disposal. Waste from towns and a village enter the drains

and sewers and carry these wastes to the rivers. It is estimated that 900 million litres of sewage enters the Ganga river every day. Garbage is also thrown by the river side, or sometimes even into the river. Defecation along the banks of the river is another common practice especially amongst the developing countries that lack in sanitation facilities. All these activities have a devastating effect on the environment which degrades and pollutes the environment to a high degree.

The international solid wastes and public cleansing association in 1970 was formed to assist countries in the general endeavor to improve sanitary services. The effect of improper excreta disposal is soil pollutants, water pollution and contamination of foods and propagation of flies. The resulting morbidities are fever, diarrheas, dysenteries, cholera, hookworm, viral hepatitis, intestinal infection and parasitic infections.

#### **Health Services:**

Health and sanitation facilities are of utmost importance not only for the environment but also for the people. The supply of water and the removal of waste has been a critical problem since centuries. The status of man's health represents the result of complex interactions between the internal biological system and the total external environmental system. Increase in the volume and growth of population leading to over-crowding has resulted in people falling victim to various diseases caused due to infection that get into the body, communicable diseases, that are transported through water and food and food-borne infections through delayed storage of food. For better health following point may kept in mind :

- ∇ There should be provisions for safe drinking water to safeguard people from health hazards. People should be periodically immunized against fatal infections and communicable diseases.
- ∇ Ample provision of hospitals, health and medical centers to ensure greater safety toward the health of the people.
- ∇ In most developing countries, health services are very poor and lack in medical facilities, qualified and trained personnel. This forces the people to go back to the local traditional ways of medication which might prove hazardous.
- ∇ A large number of people die of deficiency

diseases, due to lack of proper nutrition.

- ∇ For better health care, better nutrition (fresh vegetables and fruits) and a high standard of environment sanitation (safe drinking water supply and safe excreta disposal) are the top priorities.

#### **Role of Individual in Prevention of Pollution:**

Environment awareness and protection is the basis of healthy environment. The environment awareness changes and modifies man's attitude towards nature. It should be the duty of every citizen to educate every section of the society to protect and improve the natural environment including forests, lake, rivers, wet lands, sanctuaries and wild life. Environmental awareness is the healthy tool to fight and face the environmental crisis.

#### **Conclusion**

Symptoms of general psychological maladjustments suggest that modern cities provide a less than ideal environment for human beings. There seems to be abundant evidence that traditional cultures break down in cities and also the high numbers of contacts with individuals, who are not a part of one's circle of regular social acquaintances may lead to mental disturbances. Thus Metros are providing to be a more viable alternative to buses and local trains as they are environment-friendly is the main cause of breakdown of families. Inability to hold on to a job, incidence of suicide and a range of other mental problems, that are generated in the fast pace of urban residence. Surely one sees deterioration in himself/herself and not only in the environment.

One can conclude that the urbanized environment is deteriorating, both physically and aesthetically in spite of the materialistic development and progress. The dehumanizing effects on life in the slums and ghettos, particularly where there is little hope for improvement, have often been cited as causes contributing to crime, urban rioting and disturbances.

It is high time to advocate an "integrated" approach to the environmental programmes covering all aspects of it. It is required for co-operation between different services and departments. The several international and national environment programmes are efforts in the direction to health in the human environment.



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