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## EFFECT OF ENVIRONMENTAL POLLUTION ON HUMAN HEALTH

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### ABSTRACT

The environment and development are twin issues of high national significance. While the various components processes of environment are intimately inter-connected, the development process is along a long historical multidimensional process and is reflected in human interaction with the environment causing many of the environmental problems and pollution is one of them. Environmental pollutions are the result of misuse and overuse of resources due to lack of education, awareness and improper management. The growing population, industrialization, urbanization cause environmental pollution with an ultimate bearing on human health and hygiene, sanitation and ecological imbalances.

Keywords : Environment pollution, human

### INTRODUCTION

With rapid growth in urbanization & industrialization many environmental problems have emerged in urban areas such as sanitation, housing, overcrowding, growth of slums etc, and the problem of pollution of the environment. These problems are becoming serious and severe every year on account of fast growing population and over consumption of natural resources. The growing numbers of vehicles have almost trebled in the past one decade, adding to the growing menace of air pollution. Major cities throughout the world have become overburdened with gaseous emission from automobiles. The death rate due to automobile pollution is increasing in the metropolitan areas (Ilyas, 2010). Level of PM 10 exceeded the air quality standards prescribed by CPCB for industrial and mixed areas. It is necessary to evaluate the status of urban pollution and assess its impact on human health for scientific environmental planning of the city. Keeping this in view an attempt has also been made to evaluate the status of environmental quality in Imphal city.

Imphal, the capital city of Manipur is located at the furthest north eastern part of India. The state shares common boundary with other north-eastern states such as Assam, Mizoram and Nagaland, it also has an international boundary with Myanmar. Manipur has a total geographical area of 22,327 Sq. Km. of which the valley (Plain area) is only 10% lying at the centre surrounded by the hills. The state has nine districts and as per census 2011, the total population of Manipur is 28,55,794. Out of this, the male population is 14,38,586 and the female population is 14,17,208.

The enormous threats to the integrity of the world's great river basins have threatened the basis of our economies, the fabric action of our communities and the sources of drinking water. There are six primary threats faced by the ten most endangered river basins (Salween, La Plata, Danube, Rio Grande, Gangea, Murray-Darling, Indus, Nile, Yangtze and Mekong). Degradation of water quality is one of the major threats among the six primary threats (Wong, 2007). The South Asian countries (Afghanistan; Bangladesh; Bhutan; India; Iran; Maldives; Nepal; Pakistan; Sri Lanka) are home to about one-fourth of the world's population, but has only 4.5 per cent (1,945 billion m<sup>3</sup>) of the world's annual renewable water resources (43,659 billion m<sup>3</sup>). India being largest in terms of population and area, in South Asia, is the home to one-sixth of the world's population, while

only endowed with 1/25th of the world's available water resources (UNEP, 2008). Further lack of water resources and increasing population pressure has caused increasing water pollution. The organic and bacterial content continues to be critical in water bodies in India; this is mainly due to discharge of untreated domestic waste water (CWC, 2011).

Safe drinking water is required for all usual domestic purposes, including drinking, food preparation and personal hygiene. Yet, roughly one-sixth of the world's population lacks access to safe water, and around two-fifths lack adequate sanitation. In terms of human suffering and financial loss the costs are enormous. In developing countries the costs of disease and productivity losses linked to inadequate clean water and sanitation (Swedish Report, 2007). Domestic sewerage, poor sanitation, industrial effluents and surface runoffs are the primary sources that result in contamination of water bodies. An estimated 768 million people do not use improved sources of drinking water and 185 million relied on surface water to meet their daily drinking water needs (WHO, 2013a). Millions of people are exposed to dangerous level of biological contaminants and chemical pollutants in their drinking water due to inadequate management of urban, industrial or agricultural wastewater. Inorganic arsenic is found to be present at higher levels in groundwater of a number of countries, including Argentina, Chile, China, India (West Bengal), Mexico, the United States of America and particularly Bangladesh where 20 million and 45 million people are at risk of being exposed to arsenic concentrations that are greater than the national standard of 50 µg/l and the WHO guideline value of 10 µg/l, respectively. Contaminated water serves as a mechanism to transmit communicable diseases such as diarrhoea, cholera, dysentery, typhoid and guinea worm infection (WHO, 2013b). Water Quality status in Imphal city has deteriorated with the growth of population, urbanisation and industrialization. Surface and river water, both are in a precarious condition. Physico-cultural and bacteriological analysis of drinking water supplied by Jal Kal is not suitable for drinking purposes. It may cause harmful effect to human health. Waste water in the city contains significant amount of organic matter, which are highly bio-degradable in nature. Pollution level in the river Yamuna has risen due to industrial and domestic effluent discharge into the river through drains. The river Yamuna has been reduced to a small stream, draining industrial effluents, sewage, dirt and toxic substances (Mishra, 2010).

Deficiency in wastewater management and solid waste is affecting adversely the health condition of the people in developing countries. It is one of the major causes of infectious diseases such as diarrhoea, hepatitis, malaria, filaria and dengue fever. At the same time health service cost is considerably high in these countries. To make health services more cost-effective, preventive measures such as improvement of environmental health conditions through better solid waste management should be emphasized. World generation of Municipal Solid Wastes (MSW) is 1.3 billion tonnes per year and is estimated to increase approximately to 2.2 billion tonnes per year by 2025. This reveals that there is a significant increase in per capita waste generation from 1.2 to 1.42 kg per person per day in the next fifteen years. The class I cities contribute to more than 72 per cent of the total municipal solid waste (MSW) generated in urban areas. Today Indian cities are generating eight times more MSW than they did in 1947 because of increasing urbanization and changing life styles (Kaushal, 2012). Solid waste generated from residential, commercial, industrial areas including hospitals and nursing homes, hotels and restaurants, slaughter houses and banquet halls are disposed off at dumping sites located in outer parts of the city. It causes air, water and soil pollution resulting into ill effects on human health. According to the *Swachchh Sarvekshan* ranking released by Union Urban Development Mission, Imphal scored 1081 points out of maximum 2000. To make the study scientific various concepts and approaches of environmental studies.

### **Concept of Environment**

The word Environment is derived from the French word "Environ" which means "surrounding". Our surrounding includes biotic factors like human beings, plants, animals, microbes, etc. and abiotic factors such as light, air, water, soil, etc. In fact any external force, substance or condition that affects organisms in any way becomes a factor of their environment and the sum of all these factors constitutes an environment (Daubenmire,

1974). Fitting (1972) has defined it as the totality of milieu factors of an organism. In the early 20<sup>th</sup> century it was thought that human activities and creatures were strongly influenced and constrained by natural environment- a view styled environmental determinism. By the mid 20<sup>th</sup> century it was realized that such a rigid deterministic view was not consistent with the way that people could modify their environment so that environmental possibilism became the notion that environments provided possibilities for human choice. In the beginning the environment of early man consisted of only physical aspects of the planet earth (land, air and water) and biotic communities but with the march of time and advancement of society man extended his environment through his social, cultural, economic and political functions. It studies the spatial attributes of the entire phenomenon including man in a given space and time and highlights complex man - environment relationship at different stages and phases in time-space context while other disciplines study individual phenomenon.

In the studies, mainly two types of environment are studied, the physical environment and the cultural environment. The physical environment encompasses of all living and non-living things occurring naturally on the Earth or part of it. The physical environment may also be viewed in terms of climatic conditions providing certain suites of habitat for biological communities' viz. tropical environment, temperate environment and polar environment. It includes all rocks, atmosphere and natural phenomena that occur within their boundaries. Universal natural resources and physical phenomena that lack clear-cut boundaries, such as air, water, and climate, as well as energy, radiation, electric charge, and magnetism, not originating from human activities, are also components of physical environment. Cultural or human environment may be defined as the process by which human beings establish relationship with the natural environment and it includes man-made features such as population, human establishments, agriculture, production, political factor and transportation etc.

The environment is mainly concerned with the interaction between the physical and physico-cultural environment. The natural and cultural environment combines to form the total environment. Man survives in this environment. If man desires to survive he has to maintain ecological balance or balance of environmental energy. If any type of disturbance takes place at any level in any period of time, it would cause disturbance in the form of pollution or disaster, and may disturb the life cycle of human environment and food chain. All these environmental problems are best studied. For analysing such issue scientifically it is necessary to discuss concept of environmental pollution.

### **Concept of Pollution**

Pollution is an undesirable change in the physical, chemical or biological characteristics of air, water and soil that may harmfully affect the life or create a potential health hazard to any living organism. Pollution is thus direct or indirect changes in any component of the biosphere that is harmful to the living component and in particular undesirable for man, affecting adversely the industrial progress, cultural and natural assets or general environment.

Human activities directly or indirectly affect the environment adversely. A stone crusher adds a lot of suspended particulate matter and noise into the atmosphere. Automobiles from their tail pipes emit oxides of nitrogen, sulphur dioxide, carbon dioxide, carbon monoxide and a complex mixture of un-burnt hydrocarbons and black soot which pollute the atmosphere. Domestic sewage and run off from agricultural fields, laden with pesticide and fertilizer residues, pollute water bodies. Effluents from tanneries contain many harmful chemicals and emit foul smell. These are only a few examples which show how human activities pollute the environment. Pollution may be defined as addition of undesirable material into the environment as a result of human activities. The agents which cause environmental pollution are called pollutants. Pollutants may be defined as a physical, chemical or biological substance unintentionally released into the environment which is directly or indirectly harmful to humans and other living organisms. The term 'pollution' is widely used and almost as widely misunderstood. A number of definitions of the terms are examined and alternatives suggested. Certain natural phenomena causing deterioration in the quality of water, air, or soil may be similar in their effects to some of

man's activities, but only the latter are normally subject to man's control. There, any change in the physical, chemical, or biological characteristics of the air, water, or soil that can affect the health, survival or activities of human or other life in an undesirable way is called as pollution of the environment.

### **Environmental Pollution**

Environmental pollution means pollution of the environment due to release of any substance from any process which are capable of causing harm to man and other living organisms supported by environment (Hussain, 1998). Environmental pollution is “the contamination of the physical and biological components of the earth/atmosphere system to such an extent that normal environmental processes are adversely affected” (Kemp, 1998). Environmental pollution means lowering of environmental quality at local scale caused exclusively by modern human activities (Singh, 1991). Since the problem of environmental pollution has now become subject a matter of global concern and there is growing awareness about pollution as ‘vicious circle’ situation. A comprehensive study of pollution evolving definition and perception of pollution, types of pollution, sources of pollution, causes and processes of pollution, environmental and ecological effects of pollution, monitoring of pollution and pollution abatement program is not only desirable for environmental scientists but is also necessary that future strategies for resource utilization and comprehensive environmental management program may be formulated and implemented.

### **Pollutants**

A pollutant is defined as any form of energy or matter or action that causes disequilibrium state from equilibrium state in existing natural ecosystems (Singh, 1991). Generally a pollutant is a substance or effect introduced into the urban or rural environment, in significant concentration as sewage, waste, accidental discharges or as by-product of several manufacturing processes or by various human activities. Pollutant may be a solid, sub solid, liquid or gaseous of sub molecular particles. And pollution effect or stress is normally some kind of waste energy such as heat, noise or vibration.

There are mainly two types of pollutants visible and invisible, found in our environment. Visible pollutants include chimney smoke, waste-water coming from discharge, garbage thrown at various points in the city, and invisible pollutants are several types of bacteria toxic chemical mixed with water and soil etc. Corruption and crimes come under invisible category of social pollutants. The general cause of environmental pollution in urban areas may be classified under four general heads: (i) That caused by nature itself over which man has very little or no control, (ii) That resulting from the population in the form of sewage, solid waste and in the form of gaseous exhaust, (iii) That due to industrial establishment which discharge liquid effluents, refuse in solid form into water bodies or gaseous emission into the atmosphere, and, (iv) That resulting from agricultural waste and practices. Concept of pollution deals with its source of pollution, their characteristics.

### **Health and Disease**

The natural environment and its constituent elements like land, water, air, vegetable, animals including microorganism and human beings themselves make certain places more livable and healthy than others. The concept of human health for different communities varies according to their culture but the main theme always remains constant that the “health is soundness of body and mind; it is a condition in which body’s functions are duly and efficiently discharged” (Oxford English Dictionary). According to Perkins “health is a state of relative equilibrium of body forms and function which results from its successful dynamic adjustment to forces tending to disturb it. It is not passive interplay between body substance and forces impinging upon it but an active response of body forces working toward readjustment”. The widely accepted definition of health is that given by the World Health Organization in the preamble to its constitution: “A state of complete physical, mental and social well-being and not merely an absence of disease or infirmity and the ability to lead a socially and economically productive life” (WHO, 1948) and as “the extent to which an individual or a group is able, on the one hand, to realize aspirations and to satisfy needs, and on the other to change or cope with the environment” (WHO, 1985). Health has several dimensions and each of these dimensions is important but its relative



importance *vis-à-vis* other dimensions depends on the circumstances in which an individual or community exists and functions. Among these dimensions the important are: physical, mental, nutritional, environmental, educational, socio-cultural, economic, spiritual and emotional, preventive and curative (Mishra, 2007).

There have been many attempts to define diseases. Webster defines disease as “a condition in which body health is impaired, a departure from a state of health, an alteration of the human body interrupting the performance of vital functions.” From an ecological point of view, disease is defined as maladjustment of the human organism to the environment (Gregg, 1956). The term “disease” literally means “without ease” (uneasiness). It is opposite of ease- when something is wrong with bodily function. It is a physiological / psychological dysfunction. The simplest definition is, of course, that disease is just the opposite of health i.e. any deviation from normal functioning or state of complete physical or mental well-being since health and disease are mutually exclusive (Park, 2007). According to this, disease is a product of interaction among the agent, host and environment. The agent and the host mutually interact and both concurrently interact with the complex matrix called the environment, which is both physical and cultural. Man is able to live in widely different environmental setting: from snow covered Himalayas to the desert region of Rajasthan. Human body, however, must have a threshold of adaptability. Once the threshold is crossed, the reaction of the body to the stimuli is no longer physiological. It becomes pathological *i.e.* a symptom of disease (Mishra, 2007). Natural environment including factors like relief, soils, climate, flora and fauna have great bearing on human health. Relief has great influence on land use and land productivity. It also influences the presence and survival of other life forms including the organisms that cause diseases and hosts through which they reach the human body. Relief has a bearing on the onset and end of several communicable diseases. Slope determines the drainage system of an area. Gentle gradient is conducive to water-logging and hence favorable for the breeding of microbes, mosquitoes and various kinds of insects that produce diseases like malaria, filarial, dysentery, etc. Altitude also has great influence on the weather and climate. Higher the elevation, lower the temperature, is general rule. Many of the disease generating microbes thrive only in warm and moist climatic conditions. Elevation has also adverse effect on blood pressure. Those suffering from high blood pressure are worse off in mountain areas and those with low blood pressure are better off. There are close relationships between climate and diseases. Certain diseases are seasonal. Dehydration and cholera are common during hot summer; malaria fever during rainy seasons; and cough, cold and bronchitis during winters.

### Conclusion

We started this endeavour to assess the sustainability of the region from the objective and subjective assessment of the environmental, public health perception and attitude aspects. Throughout the study, we tried to focus on a specific type of pollution, i.e. pollution and tried to appraise its influence on a larger spatial scale in a region where the human intervention in the environment started rather in the recent past and has been taking place very rapidly. Environmental degradation, pollution and contamination is a multifactorial process in that multiple factors are responsible for causing the phenomena which include natural and anthropogenic factors. Although it is difficult to separate each factor's impact, through a systematic decision making process we have tried to quantify the overall contribution of pollution in the degradation of environmental and public health status.

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