

Natural Protection of Human Health From Environmental Pollution

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Abstract: The environment as well as the pollution are greatly comprehensive terms. The environment includes virtually everything around us, currently in their defiled forms. This has resulted in a serious degradation of the quality of life, also manifested as human ill-health. The paper contains the environmental impacts on human life as well as the natural protection of human health from it including the concepts of conviction.

Introduction

Environment, presently the most commonly used term by one and all includes everything that surrounds us viz. the air, the water, the land, the various human activities, the economy, the culture, the politics, and what not. Likewise, pollution is another most common terminology which has been adopted for common usage even by the most illiterate gentry. The author has personally heard house maids and even riksha pullers blaming pollution for all their ills. Pollution is a term which has been understood and defined differently by the various professionals. In literature, pollutionem, the latin equivalent of pollution means defilement. the chemists perceive pollution when the various chemicals intrude the environment beyond their permissible and/or acceptable levels. Likewise, for a biologist/ecologist, pollution would mean the presence of undesirable microbes or the disturbance of the distribution of the various species of organisms in an environment or the ecosystem becoming immature or unstable. For an engineer, the polluted environment loses its usefulness and thus the term pollution has to be use-specific. For example, a water whose temperature is not low enough, is polluted for industrial cooling; a water devoid of dissolved oxygen is highly polluted for fish culture; a water of high salinity is likewise considered polluted for irrigation, the agricultural use; air of low oxygen content is considered polluted for breathing; a land littered with all and everything is aesthetically polluted for sure; non-melodious and/or loud music is nerve breaking noise pollution, the 'Aye Raam and Gaya Raam' are considered political pollutants, the black-money manifests economic pollution, the miniskirts smell of cultural pollution, and so on. The environmental engineer thus, analyses (as an example) water to determine the use(s) for which it is not polluted and is most good, even as the most polluted water will surely find some use for which it can be considered suitable and exploited usefully (Bhargava, 1983b, d,e; 1985a,b,c,d,f).

Parameters of Pollution

The impurities or the foreign material or material present beyond their permissible concentrations are termed as pollutional parameters. These parameters could be classified into various categories based on the objectives of classification. For example, into physical, chemical, and bio-logical based on the type of analytical tests for their identification or determination (the parameter or the effect of the parameter or the imparted effect such as pH, hardness, turbidity, etc.) or into settleable, colloidal, and dissolved based on the size of the impurities such that the colloidal size ranges from 10^{-7} (lesser size is the dissolved size) to 10^{-4} (beyond which, it is settleable size) cm, or into conservative and non-conservative depending on the natural degradation abilities of the material; or into toxic and non-toxic; etc. (Bhargava, 1983a, d; 1984; 1985e,f).

Concepts of Safety and Aestheticity

A water, for example, is termed palatable if it pleases our physical senses, i.e., neither has objectionable turbidity, nor colour, nor taste, nor odour. On the other hand, the term wholesome is used when the water contains neither any pathogens, nor any toxicants nor excessive amount of any organic material serving as possible substrate for undesirable biological growths. Palatability is essential for the general and universal acceptability and gives a sense of cleanliness, while wholesomeness ensures safety against any possible disorder or disease. Naturally, an environmental engineer or a medical (qualified) personnel would insist on wholesomeness while the layman public would insist on palatability (Bhargava, 1983d; 1985a,c). As a result, the layman public is often driven to a palatable water source (even if it is not wholesome) such as a well water which generally looks clean, if the public water supply is not palatable (some political leader may present such a water's sample to create noise in the Indian Parliament or local Legislature Assembly. The public water supply schemes in metropol and larger cities therefore, spent well over 80% of their budget only in making the water palatable.

Pollution occurs naturally but mainly it is man-made through various human activities such as industrial giving out emissions and effluents of varying kinds; agricultural leaving unused pesticides/insecticides and fertilizers to reach the water resources; mining; construction; domestic; etc. The effluents flow into rivers, lakes, and ponds apart from percolating into the ground rendering all water resources unacceptable and polluted for many beneficial uses.

A vast majority of diseases are water-borne and occur due to consumption of untreated or inadequately treated water. Airborne diseases and neurotic disorders (mainly caused by noise pollution) are no few in the present times. Dreaded diseases like plaque originate from land pollution or from severely unhygienic conditions. The recent surat episode and the outbreak of infectious hepatitis in the mid-fifties at the national capital city of Delhi shall ever remain unforgettable.

The Indian Scene

India and its major metropol and cities are ranked very high in the merit list of the most polluted cities of the world. Kanpur already is on top of the most polluted list (Hindustan Times, 26/01/2003) There is severe pollution of all kinds all around and Indian villages and semi-urban areas (where more than 80% of Indian population lives) in particular have all the smokes (generated mainly from the domestic activities); polluted water and insanitary conditions. Even the developed urban areas are not devoid of the noise, air pollutants, unsafe drinking water (its only by chance that one can ever smell chlorine, the only index of the safe drinking municipal water), littered solid wastes everywhere at all times, educational, cultural, political and economic pollutions. But despite all this, the Indians survive in high numbers, although the author

has witnessed many Indians using air masks; ozone purified or bottled, the so called zero-bacteria water; ear plugs; etc. Perhaps the time is not far when there would be long queues for the refills for air masks and for the real potable drinking water.

The Survival of the Indians

It is anybody's observation that Indians have proved their ability to survive despite a total pollution of their entire environment. The people all over the world remain inquisitive particularly for the survival of the millions of the Indians who have been drinking a water which was hardly whole some ever. Waterborne diseased are a major health hazard. It is a common observation that many Hindu devotees drink the Ganga water directly from the river banks at Haridwar, Allahabad, Varanasi and other religious centres on the Ganga bank. To any ones knowledge, such a water is highly polluted for direct consumption and was neither rendered pollution free by the mammoth Ganga Action Plan nor the Indian rivers can ever be rendered pollution free even after tens of such Action Plans (Bhargava, 1992; 1998a,b) mainly because even in the most developed cities, about 50% of the wastewater cannot be stopped from reaching the rivers uninterruptedly as also in many heavily populated but narrow streets of say Varanasi, no sewers can be possible to lay; the faulty effluent standards evolved whimsically rather than evolving them scientifically and rationally by working back from the river/stream standards making fullest use of the river's self-purifying abilities; the right people not doing the right job; no selections/appointments through an index based evaluated merit; bureaucratic corruption (one of India's Prime Minister boldly stated that only 15% of the sanctioned money actually reaches for the execution of the projects meaning only 15% success for any one project or completion of only 15% of all projects (that is, completion of only three projects out of every 20 projects); apart from many other reasons (Bhargava, 1985d; 1992; 1998a, b).

What keeps Indians Fit Despite Consuming Polluted and Non-Potable water?

The author had chance to ponder over this problem during his studies of the Ganga and witnessed habitants living along the Ganga drinking its water directly. In a notable incident, a village belle was collecting Ganga water in a pitcher from the Ganga at Kanpur from a point near the right bank where the Ganga looked almost totally black due to a major trunk sewer outfall carrying the city's untreated/partically treated sewage. The author just asked her why she does not like to collect the water from a point a little towards the left bank of the river where the water looked much whiter as the sewage had by then not completely dispersed in the entire cross section of the river. She smilingly replied 'Babuji (Sir), how does it matter? its all Ganga any way'. Surely, she and all her family had been drinking that kind of water for years and since their births. There are many scientific arguments and observed technological data that can support the above said instance and myths related to the Ganga. Many of these would be thought provoking to seek scientific clarifications and evidences. The foremost reason responsible for preventing many waterborne diseases is of course the immunity (natural and/or acquired). The author need not say a word to elaborate this point any further in an article meant for professional research level medicos. The pathogens naturally die out in an aquatic environment. The rates varying from pathogen to pathogen depending on the various environmental factors such as the temperature, pH, composition of water, velocity of flow, turbulence generated, reaeration abilities, the self-purifying abilities of the water, etc.

The die-out rate of pathogens follows an exponential law such that their number remaining (N) after a time (t) equals $N_0 e^{-kt}$ where N_0 represents the initial number and k the proportionality constant

which is pathogen specific and depends on the various stated environmental parameters. The author expects high 'k' values because the Indian rivers (particularly the Ganga) manifested a very high (higher by an order of magnitude) coefficients of BOD (biochemical oxygen demand) assimilation and reaeration (Bhargava, 1982; 1983c; 1986a,b,c). Apart from this, the Ganga water manifested a strange disinfecting power towards the cholera vibrio (Hankin, 1896; Bhargava, 1987c) which could not survive in unboiled Ganga (Varanasi) water though they comfortably survived in the Yamuna water and the boiled Ganga water. The stated experimental study points out to the presence of some disinfecting volatile substance present in the Ganga water. The author attributes the origin of this mysterious yet magic disinfecting material to the Ganga river's bed because if the material originated from the Himalayas (Gangotri, the source of Ganga origin) its disinfecting power would have been lost after Haridwar and/or Narora (Aligarh) where all the Ganga water is diverted into the canal system and the Ganga river regenerates (after Haridwar and Narora) mostly from the groundwater infiltration and the tributaries. Bhagirath, the genius mythological God who brought down the Ganga from the Heavens (Himalayas), canalized it through such a route where the stated disinfecting material was available (Yamuna river, only about 50m away from the Ganga at some places does not manifest this property). The Ganga which is thus well known for its hostility towards the pathogens will also be equally hostile (Bhargava, 1998a) towards the anaerobes (which have similarity to pathogens in their habitat and environment needed for their survival and which cause putrefaction in the absence of oxygen). As a result, the Ganga water (Jal) stored in closed containers does not putrefy even on long storages (Bhargava, 1987c; 1998a). These arguments provide another reason why many rural people and Hindu devotees who drink Ganga water directly from the river do not fall sick as the pathogens do not survive in the Ganga river even when it is heavily polluted showing a high count of coliform (a bacteria indicative of fecal pollution and pathogens of enteric source).

In the author's opinion, one of the very significant reason why most rural people and Hindu devotees do not contract/get infected with waterborne diseases even after drinking/inhaling Ganga Jal (water) directly from the rather polluted Ganga is their strong conviction. This aspect has not as yet been proved scientifically but logically the power of conviction can to some extent be appreciated from the logic of scientific conviction. A scientific conviction is manifested when we drink water from the so called zero-bacteria/ozone water/etc. branded bottled waters although in India, plenty of duplicates of such bottled water are abundantly available and sold everywhere. The autor noticed many shoe-polishing boys in Delhi's Connaught Place selling the stated duly sealed duplicate bottled water at 50% or even less of its standard printed price. A similar example of scientific conviction is seen when we drink water which is duly chlorinated (manifested by smell of some chlorine which is intentionally left as a residual to take care of any future contaminations during the transport of water through a network of pipes and valves). Likewise, a patient feels relief even when he is given a sterilized distilled water injection because the patient always has conviction of being cured through an injection administered by a qualified professional medico. Apart from this, the author while living in Haridwar heard some saintly people saying that the Ganga water has several medicinal values. The medicinal values and the matter of conviction stated as above need more scientific investigations and exploration.

Future Needs

The medicinal values of the Ganga water may be explored from a scientific comprehensive medicinal analysis of the water of the Ganges all along its route. As for the conviction aspect the

possibility of its linkage with the psychology and mental status of a person can not be ruled out. This needs investigations and analysis of data collection through oral interviews. In the author's opinion, it is possible that the conviction brings about some momentary changes in the human system which provides or enhances the resistance needed to counter the ill-effects. The big problem will be the monitoring of such changes and what change and where? It will also involve the power of psychologic and its direction towards the origin of the need. May be that some team work including the research level medicos, psychologists, analysts, etc. would come forward to find a solution/answer.

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