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## RESEARCH ARTICLE

# ENVIRONMENTAL POLLUTION AND ITS DISASTROUS EFFECT: A REVIEW

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### ABSTRACT

Environment pollution is a wide-reaching problem and it is likely to influence the health of human populations is great. Air pollution receives one of the prime concerns in India, primarily due to rapid economic growth, industrialization and urbanization with associated increase in energy demands. Lacks of implementation of environmental regulations are contributing to the bad air quality of most of the Indian cities. Air pollutants produced in any air shed are not completely confined, but at time trespassing all the geographical boundaries, hence do not remain only a problem of urban centres, but spread and affect remote rural areas supporting large productive agricultural land. whereby the world is currently facing critical water supply and drinking water quality problems. In many parts of the world heavy metal (HM) concentrations in drinking water are higher than some international guideline values. It is known that there are million people with chronic HM poisoning which has become a worldwide public health issue, Many children die each year from diseases for which contaminated drinking water is a leading cause. This paper provides the insight view about the affects of environment pollution in the perspective of air pollution, water and soil waste pollution on human. Study finds that these kinds of pollutions are not only seriously affecting the human by diseases and problems but also the animals and plants. According to author, still time left in the hands of global institutions, governments and local bodies to use the advance resources to balance the environment for living and initiates the breathed intellectuals to live friendly with environment.,

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### INTRODUCTION

Essential elements in our earth for survival of mankind are water, air and soil. But a regarded matter is that the water that we uses are not clear ,the air that we breathe in not pure and the soil where we make harvesting is not manure. Water is that chemical substance which is vital for every living organism to survive on this planet. Water is needed by every cell of the organism's body to perform regular function. Water covers 71% of the Earth's surface, mostly in oceans and other large water bodies. Water moves constantly through a cycle of evaporation or transpiration, precipitation, and runoff, generally reaching the sea. Winds carry water vapour over land at the same rate as runoff into the sea. . Clean, fresh drinking water is essential to human and other life. Some observers have approximate that by 2025 more than half of the world population will be facing water-based vulnerability, a situation which has been called a 'water crisis' by the United Nations (Kulshre-shtha 1998). clean uncontaminated water does not occur in nature. Water pollution is any unwanted change in the state of water, contaminated with harmful substances. Any change in the physical, chemical and biological properties of water that has a harmful effect on living things is termed as 'water pollution' (WHO 1997). As a result of the unwanted human activities, water pollution is a growing hazard in many

developing countries. A more serious aspect of water-pollution is that which is caused by human activity, and industrialization (Park 2009). Some micro-biological agents like bacteria, viruses and protozoa can cause water pollution and may create various water-borne diseases. Major man-made sources of ambient air pollution include tobacco smoke, combustion of solid fuels for cooking, heating, home cleaning agents, insecticides industries, automobiles, power generation, poor environmental regulation, less efficient technology of production, congested roads, and age and poor maintenance of vehicles. The natural sources include incinerators and waste disposals, forest and agricultural fires (European Public Health Alliance, 2009). Holland *et al*, (1979) illustrated that British scientists concluded that particulate and related air pollution at high levels pose hazards to human health. According to Mishra (2003) rapid growth in urban population, growing industrialization, and rising demands for energy and motor vehicles are the aggravating air pollution levels other factors like poor environmental regulation, less able technology of production, congested roads, and age and poor maintenance of vehicles, also add to the problem. He further added that air pollution is caused of ill health and death by natural and man-made sources,

Urbanisation and industrialization has led shifting of people from village to town, which produce thousands of tons of

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Municipal solid waste (MSW) daily. The MSW amount is likely to raise drastically in the near future as the country strives to attain an industrialized nation status by the year 2020 Sharma and Shah (2005) CPCB (2004) Shekdar *et al.*, (1992). Poor collection and lacking of transportation are liable for the gathering of MSW at every nook and corner. The management of MSW is going through a decisive phase, due to the unavailability of suitable facilities to take care of and dispose of the larger amount of MSW generated daily in metropolitan cities. Traditional methods of disposal causes for the gathering of municipal wastes and the problems caused by the environment. Rathi, (2006), Ray *et al.*, (2005) Jha *et al.*, (2003) Kansal (2002) Singh and Singh (1998) Gupta *et al.*, (1998).

## **DISCUSSION**

### **Water Pollution**

Almost all human activities create some kind of environmental disorder that contaminates surrounding waters. Body wastes generated by Eating, pesticide and sediment runoff by gardening and many other activities create by-products that can find their way into the water cycle. For convenience, we can assign the large majority of sources of water pollution to three broad categories of waste (Mc Kinney and Schoch 2003). Besides this there are other two ways of water polluting sources.

- Industrial Waste pollution
- Agricultural Wastes pollution
- Agricultural Wastes pollution
- Micro-organisms Pollution
- Heavy Metal Pollution

### **Industrial Waste pollution**

The major sources for all water pollutants come from industry. Most of the industries made water pollution, but some of them doing it significantly. these are (a) power-generating (b) mining and construction, and (c) food processing industries (Mc Kinney and Schoch 2003). (d) Manufacturing

Power generating industries are the key contributors of heat and radioactivity. Practically all power plants, whatever it may be the fuel, are major sources of thermal pollution. Radiations obtained from nuclear power plants can pollute waters by discharge of mildly radioactive waste water and ground water pollution by buried radioactive waste (Mc Kinney and Schoch 2003). Radioactivity may be found in ground waters and surface waters. In ground waters it may be due to radioactive material present in underground rocks, whereas in surface waters it may have been passed on with effluents from uranium mining and enrichment plants (Rao 2001). The mining and construction industries are major contributors of sediment and acid drainage. There are basically four main types of mining impacts on water quality (Mining and Water Pollution 2011).

- i. Acid mine drainage
- ii. Heavy metal contamination and leaching
- iii. Processing chemicals pollution
- iv. Erosion and sedimentation

The role of water is not less important in food processing industry. The roles that water plays within food processing to

ensure the success of their products. Water hardness is also a critical factor in food processing. It can affect the quality of a product and playing a role in sanitation. The food processing industry is very miscellaneous. Major sectors include fruit and vegetables, dairy, meats and fish, alcoholic and non-alcoholic beverages, oils, and packaged foods. The most common environmental concerns in the industry are water consumption and wastewater discharge, chemicals used in processing and cleaning; packaging reduction and disposal, and food scraps and refuses (Mc Kinney and Schoch 2003). Manufacturing industries like chemical, oil refining, steel etc. contribute many of the most highly toxic pollutants, including a variety of organic chemicals and heavy metals (Mc Kinney and Schoch 2003). Other industries have less potential impact but are still considered highly problematic when it comes to pollution. These industries include the textile, leather tanning, paint, plastics, pharmaceutical, and paper and pulp industries (Raja and Venkatesan 2010).

### **Agricultural Wastes pollution**

Cultivation of crops and animals results in the formation of agricultural wastes. Worldwide, agriculture is the primary source of sediment pollution which includes ploughing and other activities that remove plant cover and disturb the soil. Agriculture is also a major provider of organic chemicals, mainly pesticides (Mc Kinney and Schoch 2003). Pesticides are widely used in modern agriculture in most countries throughout the world and in a large range of environments. But environmental monitoring more and more indicates that trace amounts of pesticides are present in surface and underground water bodies, far from the sites of pesticide application (Voltz *et al.* 2007). The use of nitrogen fertilizers can be a problem in areas where agriculture is becoming increasingly intensified. These fertilizers increase the concentration of nitrates in groundwater, leading to high nitrate levels in underground drinking water sources, which can cause methemoglobinemia, the life threatening "blue baby" syndrome, in very young children, which is a major problem in parts of rural Eastern Europe (Yasso *et al.* 2001). Some pesticides are applied directly on soil to kill pests in the soil or on the ground. As a result, it can create seepage of pesticides to groundwater or runoff with surface waters.

### **Domestic Wastes pollution**

These wastes are produced by households. the majority domestic waste is from Sewage or septic tank leakage that ends up in natural waters. In the past, some cities dumped untreated or barely treated sewage directly into rivers, lakes, or coastal waters. Plant nutrients occur in the form of nitrogen and phosphorus. These come not only from human waste, but also from fertilizers used extensively in household lawns and gardens (Mc Kinney and Schoch 2003). Today, many people dump their garbage into streams, lakes, rivers, and seas, thus making water bodies the final resting place of cans, bottles, plastics, and other household products. Different cleaning products are synthetic detergents and come from the petrochemical industry. Most detergents and washing powders contain phosphates, which are used to soften the water among other things. These and other chemicals contained in washing powders affect the health of all forms of life in the water.

### **Micro-organisms Pollution**

There are various micro-biological agents which can also cause water pollution if drinking water gets contaminated with these agents. The pathogenic agents involved include bacteria, viruses and protozoa etc. For example

1. Ingesting pathogenic bacteria, viruses or parasites (protozoans and helminthes) in water polluted by human or animal faeces or urine. Diseases in this category include cholera (*Cholera vibrio*), shigellosis (dysentery caused by *Shigella* spp.), typhoid (*Samonella typhi*), paratyphoid (*Samonella paratyphi*), diarrhea (*Escherichia coli*), hepatitis (Hepatitis virus) and poliomyelitis (Polio virus) (Obasohan *et al.* 2010).
2. Diseases associated with scarcity of water for personal hygiene (bathing, hand washing), laundering clothes and cleaning of cooking utensils. In this category of diseases are scabies, yaws, skin ulcers, conjunctivitis and trachoma (Obasohan *et al.* 2010).
3. Diseases associated with ingestion or penetration of human skin by infective forms that require a snail, fish or other aquatic hosts. Examples include schistosomiasis, clonorchiasis and paragonimiasis (Obasohan *et al.* 2010).
4. Diseases from being bitten by insect vector which breeds in or around water. They include malaria, dengue, yellow fever, filariasis (mosquito-borne); trypanosomiasis (tse-tse fly-borne) and onchocerciasis (black fly-borne) (Obasohan *et al.* 2010).

### **Heavy metal pollution**

Heavy metal pollution in water takes place in different ways. Soils represent a major sink for HM ions, which can then enter the food chain via water, plants or leaching into groundwater. Long-term exposure to HM may result in slowly progressing physical, muscular and neurological degenerative processes that mimic Alzheimer's disease, Parkinson's disease, muscular dystrophy, multiple sclerosis (Jones and Miller, 2008), gangrene, diabetes mellitus, hypertension and ischemic heart disease (Otlés and Cagindi, 2010). Allergies are common and repeated long-term contact with some HM or their compounds may even cause cancer (Dietert and Piepenbrink, 2006). For some HM, toxic levels can be just above the background concentrations naturally found in nature. though, HM have been tremendously released into the environment due to rapid industrialization, manufacture of fertilizers and to the high production of industrial waste originated from petroleum refining, paint manufacture, pesticides, pigment manufacture, metal plating, mining activities, smelting, battery manufacture, tanneries printing or photographic industries (Aguilera *et al.*, 2010). This has created a chief global concern because they are non-biodegradable and can be accumulated in living tissues, causing different diseases and disorders within the food chain. It is well known that HM toxicity can result in brain damage or the reduction of mental processes (Gaza *et al.*, 2005) and central nervous function (Bouchard *et al.*, 2011), lower energy levels (Holmstrup *et al.*, 2011), damage to DNA (Jomova *et al.*, 2011), alterations on the gene expression (Salgado-Bustamante *et al.*, 2010), skin (Burger *et al.*, 2007), muscle (Visnjic-Jeftic *et al.*, 2010), blood composition (Di Gioacchino *et al.*, 2008), lungs (Thomas *et al.*, 2009), kidneys (Johri *et al.*, 2010), liver (Burger *et al.*, 2007), heart (Otlés and Cagindi, 2010), and

other crucial organs for humans and other living organisms groundwater supplies most drinking water throughout the world, which the global population is around 7 billion of people, and whereas about 1.1 billion of them worldwide lack right to use to better drinking water supplies and use unsafe surface and groundwater sources. Even people availing "improved" water supplies such as household connections, public standpipes, and wells may not have safe water (Sobsey *et al.*, 2008) since it is well known that drinking water could be polluted with microorganisms (Lugoli *et al.*, 2011), arsenic (Akter and Ali, 2011), polycyclic aromatic hydrocarbons (PAHs) (Bruzzone *et al.*, 2010), organic pollutants (Wu *et al.*, 2010), nitrate and nitrite (Manassaram *et al.*, 2010) and HM (Bourdineaud, 2010).

### **Air Pollution**

Air pollution is one of the main reasons of premature deaths worldwide. Generally air pollution causes asthma, respiratory illness, cardiovascular disease, cancer, hospitalizations, emergency-room visits, work-days lost, and school-days lost (Ostro *et al.* 2006, Pope *et al.* 2006) all of which decrease economic output, divert resources, and weaken the security of nations. Air pollution and global warming are two of the most threats to human and animal health. Energy insecurity and rising prices of conventional energy sources are also main pressure to economic and political stability. A lot of alternatives to conventional energy sources have been proposed, but analyses of such options have been limited in pen and paper. With such information, policy makers can make superior decisions about supporting various options. Or else, market forces will decide the result. Decisions that may result in little promote to climate, air pollution, or energy-security problems. Global warming enhances heat stress, disease, and severity of tropical storms, ocean acidity, sea levels, and the melting of glaciers, snow pack, and sea ice. Further, it shifts the location of viable agriculture, harms ecosystems and animal habitats, and changes the timing and scale of water supply. It is due to the globally-averaged difference between warming contributions by greenhouse gases, fossil-fuel plus bio fuel soot particles, and the urban heat island effect, and cooling contributions by nonsoot aerosol particles. The primary global warming pollutants are, in order, carbon dioxide gas, fossil-fuel plus bio fuel soot particles, methane gas, (Jacobson *et al.*, 2004) about half of actual global warming to date is being masked by cooling aerosol particles, hence such particles are removed by the cleanup of air pollution, about half of hidden global warming will be unmasked. This factor alone indicates that addressing global warming rapidly is significant. Stabilizing temperatures while accounting for anticipated future growth, in fact, requires about an 80% reduction in current emissions of greenhouse gases and soot particles. Because air pollution problems are caused mainly by exhaust from solid, liquid, and gas combustion during energy production and use, such problems can be minimised by extensively changes to the energy sector.

The air we breathe is an essential ingredient for our wellbeing and a healthy life.

Unfortunately polluted air is common throughout the world especially in developed countries from 1960s like China (Kan, 2009) and others. Even famous crowded cities and countries are facing air pollution. Polluted air contains one, or more,

hazardous substance, pollutant, or contaminant that creates a hazard to general health. The main pollutants found in the air we breathe includes, particulate matter, PAHs, lead, ground-level ozone, heavy metals, sulphur dioxide, benzene, carbon monoxide and nitrogen dioxide (European Public Health Alliance, 2009). Air pollution in cities causes a shorter lifespan for city dwellers. Holland *et al.*, (1979) illustrated that British scientists concluded that particulate and related air pollution at high levels pose hazards to human health. According to Mishra (2003) rapid growth in urban population, increasing industrialization, and rising demands for energy and motor vehicles are the worsening air pollution levels.

### **Solid Waste Pollution**

Agricultural application of Municipal Solid Waste (MSW), as nutrient source for plants and as soil conditioner, is the most cost effective option of MSW management because of its advantages over traditional like land filling or incineration. On the other hand, agricultural application of MSW can lead to a potential environmental threat due to the presence of pathogens and toxic pollutant. The waste generated is afterwards released into the nearby environment. As a outcome, the management of the MSW needs to be revamped to hold the changes in the quantity and quality to ensure the longevity of the environment. Due to several legislative, environmental, economic and social constraints, the identification of most sustainable disposal route for MSW management remains an important issue in almost all industrialized countries Adani *et al.*, (2000). Generally, MSW is disposed of in low-lying areas without taking any precautions or operational controls. But, in most cities, the MSWM system comprises only four activities, i.e., waste generation, collection, transportation, and disposal. The management of MSW requires proper infrastructure, maintenance and upgrade for all activities. This becomes ever more expensive and complex due to the continuous and unplanned growth of urban centres. The difficulties in providing the desired level of public service in the urban centres are often attributed to the poor financial status of the managing municipal corporations. Agricultural application of MSW, as nutrient source for plants and as soil conditioner, is the most cost-effective MSW disposal option because of its advantages over traditional means such as land filling or incineration. According to Canellas *et al.*, (2001), the use of MSW in agricultural lands can be justified by the need of finding an appropriate destination for waste recycling. Still, agricultural application of MSW may present a would-be threat to the environment due to the presence of pathogens and several pollutants as in the form of heavy metals or organic pollutants. A better option to recycling such wastes is composting. Composting is a stabilization process through aerobic decomposition of waste, which has been widely used for different types of wastes CAI *Et Al.*, (2007). During composting, through microbial action organic nutrients present in the wastes are converted into plants available forms Ndegwa and Thompson (2001). The process can well condense the mixture volume by 40–50% and by means of the metabolic heat generated in the thermophilic phase destroy the pathogens Epstein (1997). Composting cannot be considered a new technology, but among the MSW management strategies it is gaining interest as suitable option for chemical fertilizers with environmental profit, since this process eliminates or reduces

the toxicity of MSW Araujo *et al.*, (2001) Kaushik and Garg (2003) and leads to a final product which can be used in improving and maintaining soil quality Larney and Hao (2007). Application of MSW compost in agricultural soils can directly improve soil physicochemical properties such as: soil structure, water retention capacity, buffering capacity and nutrient status Reeves (1997). In relation to soil biological properties, numerous researchers have reported different effects of MSW compost on soil microbial biomass and activity Moreno *et al.*, (1999) Selivanovskaya *et al.*, (2001) Saviozzi *et al.*, (2002) Araujo and Monteiro (2006) Barral *et al.*, (2009) RocaPerez *et al.*, (2009).

### **CONCLUSIONS**

The most natural and easily available renewable resource is Water. This valuable resource is continuously under pressure due to ever increasing industrialization, urbanization. The pressure of increasing population, loss of forest cover, untreated effluent discharge from industries and municipalities, use of non-biodegradable pesticides (fungicides, herbicides, insecticides and rodenticides), use of chemical fertilizers as an alternative of organic manures, etc are causing water pollution. In addition, there are a number of water borne diseases like cholera, diarrhoea, dysentery etc. which are transmitted by drinking contaminated water. Different water purification techniques are adopted like using rechargeable polymer beads, using the seeds of Moringa oleifera tree, by using aerobic granular sludge technology etc. Research is being conducted all over the world to develop some more new techniques which can generate pure water at low cost.

The World is currently facing critical water supply and drinking water quality problems because of drinking water quality policies, technologies, drinking water management strategies. Human resources to satisfy water-quality standards are necessities in many countries and cities all over the world. There are millions of people with chronic HM poisoning which has become a universal public health issue. The continuation of hazardous metal ions in the environment is a potential problem to water and soil quality due to their high toxicity to plant, animal and human life. Special attention should be given to drinking water. Monitoring all drinking water sources for HM should be considered throughout the world, but good test methods must be acknowledged, whereby measurement quality should include both sampling and analysis. However, to reach the requirements described earlier, technical knowledge, infrastructure, and analytical technologies are necessary, which are not easy to get in low economic development countries.. A worldwide effort to offering reasonable and healthy drinking water most to be launched around the globe, while various laws and regulations to guard and develop the utilization of drinking water resources should be updated or shaped throughout the world, including the low income countries; otherwise, the problem of HM-polluted drinking water will be growing because demand for drinking water is still evolving. Political, industrial and public education programs are required on awareness of health risks associated with HM-polluted drinking water.

The most effective solid waste management is municipal solid waste. The usual means such as land filling or incineration is

not successful since it enables recycling of potential plants nutrients. Soil microbial biomass use the nutrients present in compost. Organic materials amendment in soil, such as (MSWC), promotes microbiological activity, but the presence of potential toxic heavy metals is very important. According to some researchers finding, appreciable amount of heavy metals in MSWC does not seem to have any damaging effect on microbial biomass and enzyme activities in soil. But there are some reports which show that heavy metals present in MSWC decrease the proportion of microbial biomass C in total soil organic matter. The successful way of managing solid waste management and the new technology has to be developed in tomorrow to solve all problems. So, In the present scenario, it has been found that our environment is found to be polluted by air, water and soil. An effective measurement has to be taken in this direction to curb all this menace and find an amicable way to solve the issue

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