

Types of Pollution

All types of pollution have an impact on the living environment. The effect on living things may range from mild discomfort to serious diseases such as cancer to physical deformities. Pollution can also cause psychological and behavioral disorders in people.

The following are the types of pollution:

- Water pollution
- Air pollution
- Soil pollution

Water Pollution

This is the introduction into fresh or ocean water of chemical, physical or biological materials that degrades the quality of water and affects the organisms living in it. This process ranges from simple addition of dissolved or suspended solids to discharge of toxic pollutants such as heavy metals, pesticides, etc.

Effect on animals:

- There may be nutrient pollution (Nitrogen, phosphate e.t.c) which causes overgrowth of toxic algae and when eaten by other aquatic animals may cause death or outbreak of fish diseases.
- Contamination of water by chemicals e.g oil can negatively affect development of marine bodies, increase susceptibility to diseases, liver and kidney damage as well as nervous. Mercury in water can cause reduced reproduction, death and extinction.

Effects on plants:

- May disrupts photosynthesis in aquatic plant thus affecting the ecosystem that depends on the plant
- Terrestrial and aquatic plants may absorb pollutants and pass up the food chain to consumers.
- Plants may be killed by chemicals such as sodium chloride or pesticides in water.

Effect on humans:

- Water borne diseases when drinking water gets contaminated e.g. typhoid, amoebiasis, Giardiasis, Hepatitis, e.t.c.
- Water diseases such as rashes, pinkeye, E coli O157:H7 infection, other gastroenteritis e.t.c. can be got from contaminated beaches.

- Chemical pollutants in water such as pesticides, heavy metals can cause cancer, hormonal problems, kidney, DNA, nervous, and kidney damages and death.

Air Pollution

This is the accumulation in the atmosphere of substances that, in sufficient concentrations endangers human health or produces other measured effects. Among major sources of pollution are power and heat generation, burning of solids, industrial and agricultural processes and especially transportation.

Effects on humans:

- Reduced lung functioning
- Irritation of eyes, nose, mouth and throat
- Asthma attacks
- Respiratory symptoms e.g. coughing and wheezing
- Bronchitis
- Headaches and dizziness
- Cardiovascular problems
- Cancer
- Premature deaths

Effects on animals:

- Acid rain(formed in the air) destroys aquatic life in lakes and streams
- Ozone in the lower atmosphere may damage lung tissues
- Excessive ultra violent radiation from the sun through ozone layer that has been depleted can cause skin cancer.

Effects on plants and trees:

- Acid rain can kill trees, destroy leaves and infiltrates the soil by making it unsuitable for nutrition and habitation.
- Ozone in the lower atmosphere can prevent photosynthesis rates which can stunt plant growth.

Soil Pollution

This is the degradation of the earth's land surface through misuse of the soil by poor agricultural practices e.g. soil erosion, mineral depletion, industrial waste dumping and indiscriminate disposal of urban wastes.

Effects on Humans:

- Cancer e.g. Leukemia
- Lead in soil is especially hazardous for young children because of brain damage.
- Headaches, eye irritations skin rashes.

Effect on plants:

- May alter plant metabolism and reduce crop yield.
- Trees and plants may absorb soil contaminants and pass them up the food chain.

Effect on animals:

- Small life forms may consume harmful chemicals which when passed up the food chain to large animals may lead to increase mortality and animal extinction.
- Can alter metabolism of microorganisms and arthropods in a given soil environment. This may destroy some layers of primary food chain and have adverse effect on predators' animal species.

IMPACT OF USE OF AGROCHEMICALS ON THE ENVIRONMENT AND PUBLIC HEALTH.

What are agrochemicals? These are chemicals used for agro industries for the control of pests and vectors of diseases in both animals and plants.

Pesticides used for these purposes are divided into 2 different types which are herbicides and insecticides e.g DDT.

Agrochemicals and the environment

These are essential to help to intensify crop production and reduce the effect of pests, parasites as well as vectors causing diseases to farm animals. These chemicals can however be easily washed into streams or infiltrate the soil, eventually contaminating ground water reserves. Pesticides can be transmitted over a long distance by wind or water. This entails that the possibility exists for them to accumulate in aquatic and marine food chains far from the site of application.

Agrochemicals threat to human health

Have you ever wondered why you might have at times experienced stomach problems after taking some water? This experience may be as a result of consumption of polluted water. Chemical pollutants pose a major threat to public health through poisoning. In both fresh and marine water, algae can multiply rapidly or bloom when there is sudden increase in the nutrients of the water particularly nitrates and phosphates. This contaminated algae in turn become an important source of food for fresh water and marine animals. Toxic algal blooms have a variety of effects on the public health. In some cases people experience the signs of acute diarrhea and even death when they eat fish or animals contaminated with these chemicals.

In what ways can humans be exposed to these chemicals?

Agricultural chemicals such as pesticides and herbicides may be taken into human body by the mouth, skins or through the lungs. The uptake of chemical poisons during application is minimal unless operators unwisely eat, drink or smoke before washing hands and face. Oral poisonings usually occur through accidental exposure i.e. when pesticides are improperly stored in food containers or drink bottles. Other incidents of pesticide poisoning usually occur when recently sprayed fruits have been eaten or when chemicals are taken intentionally in case of suicide.

Contamination of the body takes place principally by absorption through the skin which is particularly vulnerable where there is cut or skin break. Remember the back of the wrists absorbs chemicals more than the palms. Also the eyes, neck, feet, armpits and groins are areas that need more protection. The risk of skin absorption is more in hot weathers when sweating occurs.

Safety precautions and Protective covering

Safety precautions to be taken in using agrochemicals depend on the hazard involved in transportation, storage and use of a particular chemical, the level of toxicity that varies according to their chemical structure, purity and formulations. The risk of poisoning by more toxic chemicals can be reduced by suitable formulations and packaging. Increasing emphasis is given to the design of application equipments that minimize the risk of exposure of the operator.

Agrochemicals must be stored in safe places and used according to instructions. The first thing the user of agrochemicals must do is to read the label and adhere to the instructions accordingly.

Protective covering

Appropriate protective coverings must be worn when pesticides are to be applied. The minimum protective covering is an overall defined as a single garment fastening at the neck and wrists.

A safe protective covering (P.C.) must meet the following criteria:

- It must cover the whole body and must also include the face shield, goggles, respirator, footwear or gloves.
- Must have sleeves over the top of the gauntlet gloves unless elbow-length gloves are needed for dipping plants or animals in pesticides/acaricides.
- It must be resistant to penetration by liquid or solid particles in the circumstances in which it is being used and minimize thermal stress to the operator who wears it.

It is advisable to wash P.C. preferably at the end of each day's spraying after all the equipment has been cleaned and stored.

IMPACT OF ANIMAL HUSBANDRY ON THE ENVIRONMENT AND HUMAN HEALTH.

Livestock farms also known as feedlots house thousands of cows, chickens or pigs produce staggering amount of animal wastes. The way these wastes are stored and used has profound effects on the humans and the environment.

Animal husbandry and activities has generated so much waste and environmental pollution e.g. 60 million hogs or pigs in the U.S.A produce an estimate 100 million tones of faeces and urine. Also 46.5 million milk and beef cows produce 500 million tones of waste per year. This has contributed to waste spills which have in turn introduced enteric pathogens into surface water. The wastes generated also contaminate ground waters with nitrates, air with ammonia and odor so offensive that could affect people psychologically.

Agricultural wastes disposal into lagoons and lakes also contribute to increase nutrients in them. This encourages the growth of algae which utilizes the oxygen to give carbon dioxide. Continuous utilization of the dissolved oxygen could cause depletion of oxygen which has an adverse effect on the aquatic bodies hence resulting into death (asphyxiation). In addition the risks of lagoon leakage, overflow and discharge pose direct treat to quality of soil and water systems. A survey

carried out between 1986-1998 by CDC demonstrated that in every case where the pathogen could be identified most likely originated from livestock.

In addition, livestock wastes when it contaminates ground water increases the nitrate level of the water. Drinking water with nitrate concentrations above recommended increase the risk of blue baby syndrome in infants below 6 months which can result in infants death as a result of oxygen deprivation. High levels of nitrates in drinking water close to hog factories have also been linked to spontaneous abortions.

In addition wide uses of antibiotics also pose dangers to the environment and human health. Large scale animal factories often give animals antibiotics as growth promoters or to compensate for illness as a result of overcrowding and poor hygienic practices. Such antibiotics can get into the environment and food chain hence resulting into antibiotic resistance in humans.

Another effect is the green house effect. Livestock wastes has been implicated in green house emissions of green house gases such as methane, carbon dioxide, nitrous oxide gases which has been found to influence global climate change as well as regional soil quality.

Also storage of animal wastes under industrial livestock facilities has been found to pose health risk to both animals and humans. This can lead to death in animals due to poor ventilation and build up of toxic gases.

In humans, death of workers in livestock facilities has also been reported due to build up of toxic gases and respiratory complications.

PREVENTION OF ENVIRONMENTAL POLLUTION

Practical remedies to these problems do exist. But implementing them will require some important changes in animal husbandry practices and government oversight.

- Public awareness and participation: Local government and the residents should have a say in whether to allow farms in their communities. The public is also entitled to review and comment on the contents of pollution reduction plans and to enforce the terms where a factory farm is in violation.

- Regulation and accountability: Factory farms should be taken as industrial facilities and should be regulated accordingly. They must be registered, obtain permits, monitor water quality as well as pollution and observe proper cleaning ,disposal and management of their wastes.
- New technology: Animal farm technology standards must be strengthened and encouraged. The FEPA must consider recent technology advances that significantly reduce pathogens and pollution.
- Pollution reduction programs in small farms: Voluntary programme must be expanded to encourage smaller factory farms which fall outside of the regulation for industries, to improve on their management practices.