ENVIRONMENTAL POLLUTION & IT'S CONSEQUENCES

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It is only recently that environmental pollution has become a major problem in Sri Lanka. Our country has been mainly an agricultural country, dependent on an agricultural economy but intensive industrialisation is now contemplated to improve the standards of living of the people. In this effort, industry would turn out to be a polluter of the air and water. Industries are springing up all over the country without proper plans and the public are now concerned with the pollution of the air and water, which are the primary necessities of life. It is therefore appropriate that the government should now contemplate to make progressive legislation at all levels to bring pollution under control.

Industrial pollution is almost a problem of unmanageable magnitude in Sri Lanka today. The smoke stacks of industry, incinerators and exhausts of motor vehicles especially buses and lorries and other internal combustion engines contaminate the atmosphere by discharging a wide range of toxic substances into air.

The discharge of industrial waste and sewage in the seas and oceans of the world is already beginning to show disturbing results in many parts of the world. The capacity of these waters to absorb waste and sewage are being stretched and will soon reach dangerous limits affecting the entire planet. These pollutants not only affect the world's fisheries, but also enter our bodies as a result of our utilising them as a major source of food.

Some of the industries that could cause pollution of the atmosphere and water in this country are Paper, Agro-chemicals, Cement, Petroleum, Leather, Ceramics, Textiles, Rubber, Rice and Saw mills, Construction industry, Asbestos and Chemical factories.

Environmental hazards through agriculture in Sri Lanka may arise from the following sources.

1. Sediments from land erosion
2. Fertilizers
3. Agrochemicals

1. Sediments from land erosion

Soil eroded from cultivated land is the chief source of sediment in rivers, streams and reservoirs but road construction, stream bank and gully erosion, housing development and logging operations are also important contributory sources. These sediments contain and absorb compounds which supply plant nutrients such as nitrogen and phosphorus and thus promote excessive growth of bacteria, algae and other plant life.

In consequence, a depletion of dissolved oxygen occurs, especially on the death and decay of these organisms, and this results in harmful effects on fish and the onset of conditions conducive to foul odours and undesirable tastes in the water. The process of enrichment of water with nutrients is known as eutrophication.

2. Fertilizers

Agricultural output is determined to a large degree by adequate fertilizer inputs. The two main fertilizer nutrients affecting water pollution are nitrogen and phosphorus.

Nitrogen in excess of crop needs is partly leached from the soil as nitrate to the surface and groundwater and partly dispersed elsewhere, in the eco-system. Excess nitrate in potable waters may indirectly affect human health and that of infants in particular. The necessity for restricting levels of nitrogen application to approximate crop needs is therefore obvious.

Phosphorus is the key element in water pollution. Though only low concentrations are found as soluble phosphate in streams, reservoirs, etc., with the inflow of runoff carrying phosphate-laden materials, the water is considerably enriched with the element and ill-effects will result.

3. Agro-Chemicals

These are organic and inorganic chemicals used for controlling plant pests, plant diseases and weeds, and are known respectively as insecticides, fungicides and herbicides (weedicides). There is little doubt that these agro-chemicals have been responsible for an appreciable increase in the production of man's food and other requirements. Further, some of them have also been used for controlling human diseases, e.g., DDT, in the control of malaria, at low cost and with great efficacy.

When tested insecticides are used with proper care and in the concentrations recommended for agricultural purposes, obvious ill-effects on man are rarely noted. Side-effects of an adverse nature may, however, occur in other sectors of the biosphere and even in man. Most of these pesticides are decomposed in the soil or changed within the plant or insect and leave little or no residues. The organochlorine insecticides like D.D.T. are the important exceptions, and are widely found in the environment in varying amounts and in the tissues of plants, animals and man. Though only very slightly soluble in water and occuring in it in traces, they are readily dissolved by fats and are absorbed by sediments.

These pesticide residues are taken-up selectively from the sediments by plankton or earthworms and then by small fish which in turn may be taken up by larger fish or birds.

The concentration of pesticidal residues is thus magnified at each stage of the food chain. This biological magnification is known to have harmful effects on certain species of fish, birds and wild life, and several such instances have been reported from different parts of the world.

Weedicides are mainly organic chemicals, being increasingly used in Sri Lanka. In general, organic herbicides decompose relatively rapidly in the soil and do not present toxic hazards to mammals.

Fungicides are inorganic or organic compounds used for controlling plant diseases both in temperate and tropical regions. There is little likelihood of contamination of food stuffs through the rational use of fungicides for disease control, if instructions for their use are correctly adopted. Many countries have introduced legislation in regard to the sale and use of agro-chemicals so as to ensure that these products are not a hazard to public health.

Beach and coastal water pollution in Sri Lanka can be examined under the following:

(i) Faecal Pollution

Faecal pollution occurs directly as well as indirectly. Direct occurence is the use of the beach for toilet purposes, and indirect occurences, the discharge of sewage effluent into the sea without proper purification or contamination of river water flowing into the sea.

Shanty settlements on the shore have added to the problem, the beaches becoming the dumping ground for disposal of garbage, sewage and domestic effluents.

Several measures have been attempted to eliminate this problem. Some of the measures are the provision of toilets to the households situated in the neighbourhood of tourist areas, community education and even patrolling of the beach.

Due to lack of supervision of Town Authorities outside Colombo, conservancy labourers do not hesitate to empty buckets of urine and at times faeces into the river or the sea.

Serious attention should be paid to the systems of sewer disposal on a national basis.

(ii) Oil Pollution

Waste oil clots, travel down to the coastal waters and settle on the sea shore. They range from tiny bits to large masses. It is a major constraint on the use of the beach as well as the coastal waters. Swimming becomes difficult with the bodies of swimmers getting smeared with oil. Walking on the beach becomes a nuisance with oil clinging onto footwear or the soles of the feet. No recreational activity is possible on such beach stretches. The waste oil also settles on the reef, rock and sandy crevices, affecting the living environment.

In the ports, sufficient facilities for disposal of wastes, waste oil etc. by ships coming into the ports are not available due to lack of

funds. Also any form of monitoring or surveilance of our ports requires financial outlays for personnel and equipment.

(iii) Waste and Storm Water Pollution:-

Waste water pollution is common in our urban areas where the domestic wastes are discharged into the coastal waters.

Storm water too carries with it the urban wastes into the sea. Storm water outlets have become waste water outlets too. Hoteliers too are offenders in certain areas.

(iv) Industrial Pollution:-

The development of offshore industrial areas and the pollution by industrial waste of waterways discharging into the sea contaminate coastal waters. A few instances are the outlet for leading coconut husk water into the sea off Induruwa & Bentota, waste from saw mills in Bolgoda lake, the flour mill wastes at Mutuwal, and effluents from the Paper Factory at Valachchenai.

An occupation which (common knowledge) is removal of coral off our coasts. The dynamiting of fish also damage the coral. A public corporation too purchased coral removed from the East coast. The coral reef is a protection against sea erosion. The effects of sea erosion is evident on a drive down South.

The coral reef also serves as the home of varieties of fish including the erotic coral fish. Lobsters too depend on the coral reef. Removal of coral has adverse effects on fish.

Another problem which is approaching serious proportions is the collection of erotic fish. This occurs on the South coast and the North-East coast. Their conservation is an urgent necessity.

The main three sources, by which toxic substances may enter the human body are by ingestion, absorption through the skin and by inhalation. It is reported that the greatest majority of occupational diseases are caused by inhalation as it affords rapid intake of contaminants by the body.

Some pollutants in air and their effect on human health

1. Carbon Monoxide

By combining with haemoglobin deprives tissues of oxygen; individuals suffering from cardio-respiratory disease are more sensitive; psycho physiological effects are possible even at low concentrations; smoking is an important source, perhaps more significant that a exposure to motor vehicle exhausts.

2. Oxides of Sulphur in combination with airborne particles (smoke)

Aggravation of existing respiratory diseases and contribution to their development, impairment of lung function, sensory irritation.

3. Oxidants including ozone

Eye irritation, possible association with asthmatic attacks, impairment of lung function in diseased persons.

4. Airborne particles

Increase in the effects of gaseous pollutants such as sulphur dioxide, possible toxic effects depending on chemical composition (e.g. particles containing lead or asbestos)

5. Lead

Intake through water, air and food enhances the total body burden of this element, in excessive amounts it may be poisonous.

6. Asbestos

A possible factor in the incidence of lung diseases along with other air pollutants and smoking — pleural clacification observed also in non-occupational exposure.

7. Berylium

"Neighbourhood" cases of chronic berylium poisoning observed near berylium production plants.

Some pollutants in land & water and their effect on human health

1. Industrial and radioactive waste:-
Effect from stored toxic metal and other substances through food chains.

2. Human excreta:-
Schistosomiasis, taeniasis, hookworm and other infections.

3. Sewage:
Urban filariasis, flies and other disease vectors.

4. Garbage and vectors inhabiting it:-
Rodent borne disease, pollution of water and air from disposal practices.

5. Pesticides:-
Contamination of vegetation and secondary food stuffs and entry into food chain.

SAVE OUR ENDANGERED TROPICAL FORESTS

THEY ARE OUR MOST VALUABLE GENE BANKS

TECHNICAL COMMITTEE

ON

THE CONSERVATION OF GENETIC RESOURCES

NARESA