

Environmental Pollution by Agro Chemicals

Dr. Raja Amarasekera
Secretary
Ministry of Environment

In a recently concluded UNDP/ ESCAP consultation in Bangkok, it was observed that abuse of pesticides and uncontrolled industrial pollution constituted a major public health hazard in the ESCAP region (Asia and Pacific States). The World Commission on Environment Development (WCED) states that much of the economic development of the Asia-Pacific region was at the expense of land and environment quality. This is apparent from the fact that virtually all indicators of the State of Environment in the region had sharply declined by the end of the decade.

Although, industrial pollution on the environment in Sri Lanka is minimal when compared to the neighbouring states, the same cannot be said of agricultural pollutants viz. fertilizers, pesticides (insecticides, fungicides, nematocides and weedicides) and plant hormones. Therefore, pollution from industry can be considerably controlled on the basis of experiences specifically from the newly emergent industrial economies (Singapore, South Korea, Japan, Malaysia, Thailand, Indonesia, etc.).

The green revolution in Sri Lanka specifically in relation to rice production was achieved by the use of short-aged rice varieties which are highly responsive to increase levels of fertilizer application. The high yielding rice varieties also necessitates application of high dosage levels of pesticides especially fungicides and insecticides as these rice varieties (BG & IR) are comparatively more susceptible to rice pests and diseases than the traditional long-aged and less yielding H - varieties. While fertilizer application in terms of prescribed levels for field crops (chillies, onions, greengram, cowpea and upcountry vegetable) are less complied with in Sri Lanka, pesticide applications have been considerably high especially. Of course the combination of proper fertilizer and pesticide management have than the stipulated norms resulted in climatic crop yields.

The indiscriminate use of pesticide application especially weedicides soil insecticides and fungicides results in serious soil degradation problems, causing an upset in the ecological balance of soil micro-organisms (both micro flora and fauna). Loss of soil micro-organisms such as nitrogen fixation bacteria and other beneficial forms causes in the lowering of soil quality. The lack of proper fertilizer management of soils (viz: judicious use of inorganic and organic fertilizers) leads to the loss of soil texture and tilth, water retention capacity and micro-nutrients culminating in soil impoverishment.

The excessive use of pesticide and fertilizer in recent times has caused underground water pollution and has effected the water lens in some locations of the North and North-Eastern parts of the country especially in regasol and latasol soils where the water table is low. Thus, water quality monitoring in susceptible agro-ecological zones is essential to prevent contamination of underground water resources to prevent health hazards. In addition to water and soil pollution, agro-chemicals have also resulted in increased of fish kills and other forms of aquatic life. Food contamination of pesticides has also been reported in pre-harvest and post harvest spraying operations. This is significantly high in upcountry vegetable growing areas where poisoning from pesticides is frequently reported.

In this context, it is of paramount importance to ensure effective use of agro-chemicals with minimum damage to environmental resources. Some of the measures that may be undertaken to achieve this objective are enumerated below:—

- (i) Conserve plant genetic resources which are resistant to pests and diseases, thereby, reducing pesticide use.
- (ii) Conserve plant genetic sources which are high yielding and less responsive to artificial inorganic fertilizers.
- (iii) Establishment of a genetic resource centre in the Central Agricultural Research Institute has been a very progressive step in this direction.
- (iv) Use of biotechnology to modify plant geno-types in order to introduce resistance to plant pests and diseases.
- (v) Similarly, use of biotechnology to select new plant geno-types which are responsive to low levels of fertilizer treatment.
- (vi) Develop use of bio-algal fertilizer and increased nitrogen fixation methods in soils so that application of artificial fertilizer could be reduced.
- (vii) Proper management of plant pests and diseases should be undertaken using alternative (non-chemical) methods of pest control such as biological, ecological and integrated systems of pest/disease control.
- (viii) Monitoring of pesticide and fertilizer residues in soils and water should be mandatory in areas, where, application levels are high.
- (ix) Legislative enforcement should be strengthened to minimize agro-chemical pollution in susceptible ecosystems.
- (x) Create public awareness about the health hazards of agro-chemicals to man and his environment specifically contamination of the food system, through interaction of biological chains and bioconcentration.