

## Water & Pesticides? The Complete Picture

Recently much controversy and confusion surrounded both the packaged water industry and public health with respect to pesticide limits, quality standards and testing methods. As a technical member of the Indian Bottled Water Manufacturers' Association (IBWMA), IEI took the lead in convening, on behalf of the IBWMA, an interactive journalist meet to put the facts in correct perspective before the press. Here's the gist.

### Raw Water Deal for Industry?

Pesticide residues have been found in mass consumed foods like cereals, fruits, soft drinks, and even milk. Was the packaged water industry then unjustifiably singled out?

Packaged water treatment obviously does not involve addition of pesticides into the water; already present in some raw water sources, treatment in fact reduces the level of pesticides to within regulated safe limits in the treated water. The Bureau of Indian Standards (BIS) regulates the quality of packaged water under the ambit of the Food Adulteration Act. The Health Ministry which administers the Act defines the standards and testing techniques for packaged water. Water quality is certified by BIS after prescribed testing periodically. Manufacturers of repute like Ion Exchange India go beyond BIS standards and incorporate international norms as well with respect to pesticide residue limits and other parameters.

The Delhi based Centre of Science and Environment (CSE) study reported pesticide residue in samples of some packaged water brands, which were tested according to EU norms using USEPA techniques (capillary column gas chromatography by electron capture detection – very few such facilities are available in the country).

The immediate government reaction was to announce an imminent (now postponed) revision in standards and the shutting down of several plants, many on procedural grounds and administrative non-conformities. Vague on ground water testing and permissions needed by licensee manufacturers from Central Govt/Central Ground Water Authorities, ground water – alleged source of pesticides – was left out of inquiry.

### Industry welcomes upward revision of quality standards

IBWMA, on behalf of its members, emphasised that consumer wellbeing must outweigh all other considerations. Additional investment would no doubt be required by some manufacturers to upgrade technology/equipment to meet new standards, disadvantaging the 700 odd licensees, mostly from the small scale sector and perhaps leading to a 30-40% price increase to consumers. This however does not justify Indian standards being lower than international norms when it comes to consumer health. Apart from predominant safety issues, in sheer economic terms too India will otherwise lose out on international markets.

### But what about the common man?

As mentioned earlier, packaged water is treated to meet regulated standards of quality. Pesticides are not added through treatment; rather, if present in the raw water, their levels are reduced to prescribed safe limits by specific treatment. A revision of standards limited to just packaged water quality will not solve the problems of the common man who cannot afford packaged

water or point-of-use treatment and has to rely on municipal and other controlled water supply sources. These too therefore must be brought within the ambit of the drinking water quality standards.



Water is also the main ingredient in products of the beverage and brewery industries. And what about other edible products and food

consumed by the Indian public? Pesticide residues are present in mass consumed foods like cereals, vegetables, fruit and milk.

*Codex permissible limits for pesticide residuals in banana is 38.68 ppm and cabbage 149.14 ppm vis-a-vis EU norms for water at 0.0005 ppm.*

## Tracing the problem to its source

How do pesticides find their way into the water and food that we consume?

### Agricultural Practices

- Soil and groundwater contain residue of agricultural practices (use of fertilisers, pesticides, herbicides, insecticides) and improperly disposed industrial wastes.
- When used for irrigation,



pollutants get transmitted through crops to their consumers.

- Agricultural chemicals dissolved by rain water and irrigation enter surface water through run-offs or ground-

water by seeping downward through soil layers.

- Pesticides sprayed on

crops are ingested by animals and human beings.



### Effluent Disposal

- Surface water sources get contaminated by toxic waste dumping from fertiliser,



chemical, metallurgical and other industries; discharge of household waste including herbicides and insecticides.

## Setting Standards – Issues to Consider

- India is a signatory to the WTO agreement which sets out Codex guidelines, accepted globally as the basis to formulate product standards. (Packaged water standards must be in accordance with Codex CAC/RCP 48 Guidelines for Drinking Water Quality.) Codex guidelines are in turn based on World Health Organisation (WHO) standards for drinking water quality. WHO norms are flexible and permit each country to establish its own standards based on factors applicable to it – taking into account resources, regional aspects, pesticide usage and removal.
- Standards used even in countries like USA and EU differ from each other especially on pesticide residue limits. For example, the permissible EU limit for Lindane residue is 0.0001 mg per litre, while Codex permits 0.0002 mg/l (100% more) and for Alachlor it is 0.0002 and 0.2 respectively (20,000% more). One certainly cannot conclude that Americans drink more poisonous water than Europeans.
- USFDA norms for packaged water set lower limits than in the BIS amendment that was being considered. USFDA & allied studies set some individual pesticide limits of 0.04 mg/l limits as safe for human consumption – these are 100 times lower than combined limit proposed for all pesticides. EU permissible pesticide limits under EEC directive 80/778/EEC provide 62 parameters for quality of drinking water intended for human consumption. Norms recommended in EU countries over 20 years (1980 onwards) are still not fully implemented by all member nations.
- Though water purification systems efficiently reduce levels of pesticides, results cannot be compared with EU countries due to different initial concentration levels in source water supplies. DDT for example has been banned in Europe some 20 years ago but used in India till recently. Many toxic wastes and pesticides like atrazine which are banned in developed countries continue to be dumped in India. It is imperative to restrict their entry into India before highlighting their residual values in water.

- Chemical wastes from industrial processes often contain toxic substances including copper, zinc, cadmium, lead, nickel and mercury.
- Herbicides, insecticides, pesticides leach into groundwater and soil through unlined landfills and toxic dumps, leaking underground storage and septic tanks.

### Natural Minerals

- Arsenic, fluoride, iron leach into underground water from soil and rock formations; concentrations increase due to over exploitation of groundwater resources.

*Thus pollutants of many kinds – pesticides, industrial chemicals, heavy metals, minerals, municipal wastes and urban run-off find their way into water supply network and into drinking water and even food crops and milk.*

### Required – Integrated approach for holistic solution

*Only an integrated approach will contain the growing danger to consumer health from pesticides present in the food chain, due to their contamination of soil and surface/ground water. The Standards Committee for different food items needs to set similar limits for food items so that total intake is restricted to safe level. The IBWMA put forward to the Union Health Ministry a series of recommendations that would introduce standards that protect consumer health and are in line with the environmental, economic, social and geographical conditions prevalent in the country and with its agricultural and import policies.*

### Contain the problem at all levels

- The Association has recommended that the Ministry of Agriculture be involved in controlling the problem of pesticides in crops and other agricultural produce.
- It has advocated appointment of a committee by the FDA under the Ministry of Health to thoroughly study the approval and usage of pesticides in India and their impact on human health with special reference to infants and pregnant & lactating women.
- The regionwise study should include level of pesticides in underground water tables, major river systems, lakes and natural reservoirs as well as food consumption patterns and quantity of pesticides being consumed through food. Working

- to a 5-year time frame, the committee should issue a white paper on contamination of food items by pesticides and their safe levels for the benefit of consumers and set limits for pesticide levels in different food items so that total intake by consumers is within safe limits.
- Simultaneously pesticide manufacturers should start researching and producing safer, less toxic compounds.

### Safe drinking water

With respect to water, IBWMA recommended phased implementation of revised standards, preceded by debate and research on different standards, involvement of industry, upgrading of detection equipment, testing methods in the country, and monitoring mechanisms.

- Undertake a study of various drinking water standards to arrive at those best suited to country's economic, social, environmental conditions; agricultural practices and effluent disposal norms.
- Incorporate views of industry representatives including the small scale sector before framing amendments and implementation plans.
- Guide industry in achieving new standards by way of new technologies, new methods, new procedures.
- Phased implementation so industry has preparatory time to adopt new technology or install new plants if required to achieve revised standards.
- Quality of municipal water and other controlled water supply sources should be included in new drinking water standards.
- Upgrade BIS & FDA lab facilities for testing to new standards.
- Install viable mechanisms for enforcing quality norms.
- Periodically review and re-assess standards and implementation based on new findings in particular areas.

### Needed – Joint Vision and Participation

- Ministries of Agriculture, Environment, Health, Consumer Affairs
- Water Authorities, PWDs, PHEDS
- Related industries and industry associations
- Technology experts
- Research institutes
- Citizen and consumer forums