Contaminated food chain

POINT BLANK

Fishkill and plastic-eating cows

Pollution enters the food chain in multiple ways. If untreated sewage in lakes and river streams contaminates the water that irrigates vegetable farms, poorly managed solid waste could be equally dangerous. Cattle feeding on plastic bags and frequent fishkill in the city lakes are tell-tale signs of an ecosystem gone horribly wrong.

Veterinarians are on record citing operations on cows that revealed upwards of 50kg of plastic bags in their stomachs. The more plastic in their stomach, the less food it consumes. This directly reduces the milk production. Scurrying for food in roadside garbage bins, the cows find it tough to tear the plastic bags. Eventually, the entire bag gets in.

Instances of fishkill, the death of native fish in thousands, are getting more frequent than before in the city lakes. This trend, last seen in Halasuru lake, has serious consequences for the fish-eating public. Dr T V Ramachandra from the Centre for Ecological Sciences, Indian Institute of Science, attributes this to bioaccumulation, accumulation of chemicals in the algae. Fish eats the algae, transferring the toxic substances.

Simply put, bioaccumulation occurs when an organism absorbs a - possibly toxic - substance at a rate faster than that at which the substance is lost by catabolism and excretion. "This happens when the fish feeds on the algae and zooplankton (organisms drifting in the water bodies). The trend is very worrying. It could lead to severe health complications," points out Dr Ramachandra.

Fish farmers introduced the African cat fish in lakes galore since their survival rate is much better than the native fish. This has, however, complicated matters since the exotic variety even feeds on the native fish.

RESEARCH FINDINGS

- A study by professors from the Department of Environmental Sciences, Bangalore University, R K Somashekhar and Seyed Esmaeil Mahdavian showed that fruits collected from KR Market and Yeshwantpur market had variable concentrations of pesticides.
- A 2014 study by H L Ramesh and V N Yogananda Murthy found heavy metal contamination in green leafy vegetables, especially palak and coriander.
- Yogananda Murthy, Research Coordinator, Azyme Biosciences Private Limited, explains: "Green leafy vegetable samples were collected from five sampling stations - Byramangala, Bellandur, Ramagondanahalli, Jigani and Parappana Agrahara. The lead concentration was exceedingly high in palak (28.43ppm to 149.50ppm) and coriander (54.69ppm to 75.50ppm) in all stations . In coriander leaves, copper, zinc and manganese were found in all stations."
- This study also found that farmers were using water from polluted lakes located at the sampling stations. The pollution was due to the direct flow of effluents to lakes from industries and households.

Send in your suggestions on heavy metal contamination in vegetables to pointblank@deccanherald.co.in

Toxic lakes, poisoned veg farms

Irrigated by sewage-fed lake water, vegetable farms on the city's outskirts are contaminating the food chain with chemicals hazardous to human health. There is no system in place to regulate this dangerous trend in markets across Bengaluru

Fresh, green and inviting, the vegetables were neatly decked up in stalls lined up to beckon the weekend customers. But before those greens reached the markets, farmers had to grow them with all the attendant problems. Did that complex process involve irrigation with highly polluted water sourced from the city's lakes and river streams?

It is a tough, but heavily loaded question. Loaded, because repeated studies by city-based universities and scientific institutions have clearly indicated heavy metal contamination in vegetables sold in big markets across Bengaluru.

Irrigated by sewage-fed lake water on agricultural land, contamination of the greens has been proved beyond doubt. Analyzing samples of water, soil and crop plants, the tests have shown significant traces of zinc, copper, lead and cadmium in the greens that directly influence our food chain.

Contamination

Twelve years ago, when the Bellandur lake's pollution levels were high but not at today's alarming levels, a Bangalore University study had shown high heavy metal contamination in vegetables grown in the vicinity. The impact of the lake's polluted water on vegetation was found to be much more than soil.

Incessant flow of untreated sewage from multiple inlets, encroachment and wide-spread development have effectively killed vegetable farming in Bellandur. Cultivation has gradually shifted to Varthur and Hoodi lakebeds on the downstream.

But here lies the big problem: Highly polluted water from Bellandur flows into the downstream lakes, contaminating the ground water as well. It is mostly this water that is being drilled out through borewells by the farmers.

As if this is not hazardous enough, the vegetables are also washed with the lake water before they are loaded onto distribution trucks.

Their produce is supplied to vegetable markets in Marathahalli, KR Puram, Whitefield, HAL and other areas within a 20km radius. At the HAL market, for instance, supplies start at around 3 am. Enquiries reveal that most vegetables are sourced from farms in Hoodi, Kadugodi, Varthur and other areas.

Customers unaware

Not many customers are aware of this supply chain, although most retailers feign ignorance about the irrigation methods for fear of losing clients.

Nirupam, a customer, says he has been buying vegetables from the HAL market for nearly a decade. But he admits he had never asked where the greens came from.

In recent years, say the retailers, supplies from Varthur side have been declining as farms are being traded for real estate. Huge apartment blocks and malls have come up on once fertile lands. To compensate the shortfall, supplies often come from KR Market.

Yet, that is not a safe bet. An ongoing study by the Ashoka Trust for Research in Ecology and the Environment (Atree) has already indicated contamination in vegetables grown in the command area of the Byramangala tank on the Vrushabhavathi river.

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Vrushabhavathi pollution

Over the last three years, tests on water and soil samples collected from the area growing babycorn have shown accumulation of heavy metals, as Atree researcher Priyanka informs. Heavily polluted with industrial effluents and untreated domestic sewage, the Vrushabhavathi river feeds this water directly into the Byramangala tank.

Babycorn cultivation has graduated to tomatoes and other vegetables in recent months. These greens make their way to the KR Market and Kalasipalyam outlets, eventually heading to other vegetable bazaars in the city interior.

Heavy metal contamination of water can be effectively tracked only with 24-hour sampling, says Priyanka.

For the study on Vrushabhavathi, the water was measured day and night. Heavy metal traces were found to peak during the night.

This is a clear indication that industrial effluents are being discharged after dusk to hoodwink the agencies.

Stringent quality tests

The message is clear: The Karnataka State Pollution Control Board (KSPCB) needs to change its water quality monitoring protocol. Atree is now in talks with the Board to make the testing more scientific and stringent. Its data analysis on Vrishabhavathi and Byramangala tank is also being shared with KSPCB.

But water quality monitoring is only a part of the mechanism to prevent health hazards of irrigation with sewage-fed water. Soil and plant quality are equally critical. The University study showed that the presence of cadmium in spinach (4 mg g-1) and radish (2.5 mg g-1) is way beyond the acceptable standards.

Rasheed Kappan

Vegetables with heavy metal contamination

Find their way to markets across the city

Become part of household waste, left untreated into lakes

Lakes get polluted, feed water for vegetable farming

Farming with waste water a health hazard

Polluted air and water might be Bengaluru's bane, but vegetables grown on farms irrigated with contaminated water have given it a hazardous twist. Interactions with farmers, retailers and consumers indicate that a big chunk of vegetables arriving in markets across the City might show chemical contamination if tested.

Puroshottam Gowda, a farmer from Ballari opines that the share of such vegetables could be as high as 75%. "Most of the vegetables are grown near Kengeri and surrounding areas. The farmers grow greens, tomato, cabbage and other vegetables using water from a sewage treatment plant. The water is supposed to be purified but at most places, the plants do not work. This is unfortunate."

However, RV Gopi, President, Wholesale Vegetables and Fruits Traders Merchant Association, does not agree. According to him, drainage water was earlier being used by vegetable growers in Kengeri, Gollahalli and Varthur. But now, says he, most of the farmers have stopped vegetable farming there due to encroachment of lakes and rapid urbanisation.

Sellers and middlemen at Agricultural Produce Marketing Committee (APMC) Yard, Yeshwantpur admit that the quality of fruits and vegetables has come down because of bad water quality and pollution.

Yet, there are many others who deny using dirty water to grow greens. Suresh, a wholesale onion and potato merchant from APMC contends that most of his produce comes from Maharashtra and Chitradurga region. He says the farmers there depend on borewell water and tap water to grow vegetables and not drainage.

Hoskote-based farmer Chandra Gowda claims he uses borewell water for vegetable farming. But he has seen a few farmers using water from polluted lakes in his locality.

Environmentalists suggest that reducing pollution at water source points and increasing awareness among public on the dangers of consuming food with high heavy metal contamination could be helpful. But consumers say they are helpless. Despite knowing the harmful effects of chemical contamination, they have no choice but to buy the fruits and vegetables from the markets.

"Today, everything from water to air to soil is contaminated. I try washing fruits and vegetables with running water as many times as possible and boil them properly before consuming them. We cannot avoid consuming them. Taking precautionary measures is the best available option."

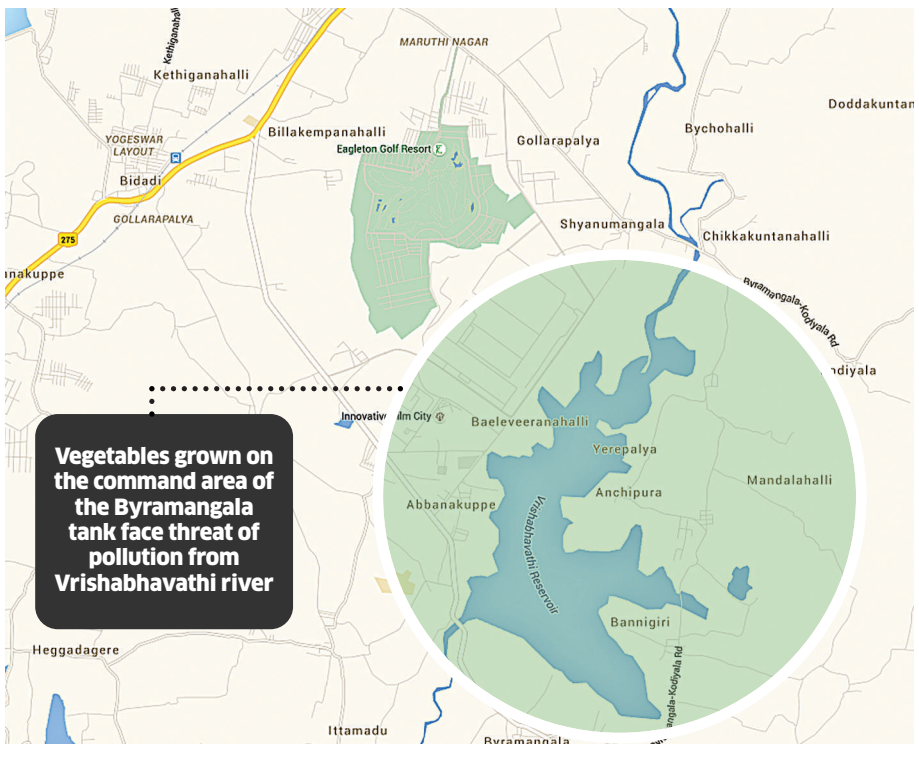
Says Sheela Kumar, a resident of Hennur: "Today, everything from water to air to soil is contaminated. I try washing fruits and vegetables with running water as many times as possible and boil them properly before consuming them. We cannot avoid consuming them. Taking precautionary measures is the best available option."

Malini Parmar, a resident of Bellandur and an active member of Kasa Muktha Bellandur, informs that BBMP had conducted a drive in her locality to seize plastics. The Palike personnel confiscated boxes filled with artificial colouring content from vegetable farmers. These were used to add colour to peas.

Parmar sees a way out in using organic vegetables. She explains, "The best way to avoid consumption of harmful produce is by buying organic produce. Though it is expensive, it is worth as it keeps me and my family healthy. Apart from sewage effluents inside the lake, garbage is also being burnt and dumped there. I see ashes floating atop Bellandur lake due to burning of waste."

Malleswaram resident Sampath Kumar agrees that organic vegetables could be an option only if people can afford them. "Not everyone can buy organic stuff," he points out.

Nivedita Jain



Vegetables grown on the command area of the Byramangala tank face threat of pollution from Vrishabhavathi river

R V GOPI, President, Wholesale Vegetable & Fruit Traders & Merchants Association

Most of the vegetables that get into the markets in the City come from outside. Only borewell water or other clean water sources are used for growing the greens. Earlier, the farmers used to irrigate their farm lands with drainage water. But now, they don't.

PRADEEP KUMAR M O
Resident, Horamavu

It is unfortunate that vegetables are grown using contaminated water from the lakes. Besides the chemicals in the pesticides, the farmers wash the vegetables with the same polluted water. This is double poisoning. It is a dangerous practice that needs to be stopped.

DEEPAK SHET
Counsellor, Rajajinagar

People should stress on hygienic conditions. Water treatment plants should be set up at various places and only the treated water should be used for vegetable farming. Organic vegetables should be promoted. Awareness should be created about the ill-effects of consuming farm products grown using contaminated water.

MALINI PARMAR
Resident, Bellandur

The only way to be healthy is to consume organic produce as much as possible. Vegetables or fruits laced with chemicals should be avoided. There should be more awareness among the public about organic vegetables and how safe it is to consume them.