Toxics Link
for a toxics-free world

TOXICS Dispatch

Volume 3 | September 2025

Pic: Pexels

Antimicrobials and Food Production in India

Antibiotic misuse in food production not only threatens public health but also jeopardises India's food security and export markets. Addressing it requires a balanced approach combining regulation, farmer support, and consumer awareness.

By Vidhi Mathur

The discovery of antimicrobials was a turning point in modern medicine, transforming once-deadly infections into treatable conditions. But what began as a life-saving modality soon found its way into cosmetics, agriculture and industries, fuelling the rapid spread of antimicrobial resistance (AMR). In 2019 alone, AMR claimed nearly 3,00,000 lives in India. The World Bank warns that, without urgent intervention, the global GDP could shrink to up to 3.8% by 2050.[1] A major driver of this crisis is the animal food production sector, where antibiotics are not only used to treat illnesses but also for disease prevention and growth promotion, creating reservoirs of resistant microbes in the environment and food chain.

Remarkably, Scottish physician and microbiologist Sir Alexander Fleming, who discovered penicillin, the first widely effective antibiotic, in his Nobel Prize lecture in 1945, warned of the dangers of the newly discovered drug becoming ineffective if used in too small doses or for too short a duration.[2] His warning now resonates more urgently than ever, as the world grapples with the growing threat of AMR, which endangers both public health and the very foundation of modern medicine.

History of antibiotic use in food production

Antibiotics have been used in food production since the late 1930s, beginning with sulphonamides (the oldest class of antibiotics), such as Prontosil and sulphapyridine, which were marketed exclusively for animals.[3] Over the years, with closer ties between pharmaceutical and feedstuff companies, researchers began experimenting with mass medication of herds and flocks.[4] Medicated feed and water were not only able to curb disease in concentrated animal populations but also boost productivity by reducing the labour required for individual animal care.

Studies further confirmed that feeding low-dose antibiotic growth promoters (AGPs) not only increased weight, but also prophylactically protected animals against bacterial disease.[5,7] Although at this point, European veterinarians were already using antimicrobials, normalisation of trade and falling drug prices at the end of the war

MANAGING EDITOR:
Satish Sinha
satish@toxicslink.org

EDITORIAL TEAM:
Sucheta Das Mohapatra
Mamta Gupta
comm@toxicslink.org

DESIGN BY:
Aspire Design
aspiredesign@gmail.com

IN THIS ISSUE

EDITORIAL

SATISH SINHA
Associate Director, Toxics Link

India, this year, witnessed a second consecutive year of good monsoon, though slightly prolonged and uneven. A few states especially in the Himalayan region received highly uneven and at times excessive rainfall causing serious destruction to life and property. The scale of devastation and destruction year-on-year raises serious questions on what could be the possible causes of such extreme and random weather patterns being accepted as a new normal. Many would link and attribute this to the global environmental crisis, "climate change". While there could be several causative factors, I have come to believe that the mindless development patterns and the altered ecology of the Himalayan region have also contributed to such destructions in the region. This calls for an urgent rethink and recalibration. The development process must imbibe and integrate the concepts of sustainability, be region specific, and create a balance between social, economic and environmental wellbeing.

The world is headed towards two important Conference of Parties (COP) in November — one on "Climate" and the other on "Mercury". Both these treaties come with their own share of challenges, especially so post the failure of the plastics treaty negotiations. However, these conventions and treaties are also our beacon of hope as they help and guide the national governments to work towards addressing global crises while also addressing local issues. Many of the decisions taken will provide highly effective solutions to complex environmental challenges, also throwing open, new and sustainable opportunities for businesses.

The Conference of Parties for the Minamata is meeting in Geneva early November to take stock of previous actions by nations and to plan the future course. India, it appears, is in a comfortable space on some account as we have been able to address several aspects of the treaty, especially on use of mercury in products and industrial processes. We have made significant gains in shifting to non-mercury containing measuring devices (thermometers and sphygmomanometers), compact fluorescent lamps containing mercury not exceeding 5mg, light-emitting diode (LED), and skin lightening creams and soaps containing mercury below 1ppm as specified in the treaty. We have also made significant gains in moving away from mercury amalgam that are used as a restorative material in dental practices.

Dentistry, possibly, is one such sector where India has the potential to completely phase out the use of mercury and make it mercury free. Several dental associations across states of our country have strongly voiced their opinion and resolved to phase out this material. They have also been vocal in suggesting that the dental colleges amend the curriculum and include alternate restorative materials. It's a critical change that needs immediate attention of the concerned government departments to promote and encourage use of safer materials in dental practices. While we have made good progress towards achieving select treaty objectives, there is a need for government support to implement the treaty with appropriate and supportive regulatory frameworks.

As we slowly and gradually transition into festive season and cooler months, the states in North India are once again apprehensive of the usual phenomenon of poor air quality and the difficult times ahead. The challenges related to air quality are serious with deep and multiple impacts on public health, impacting populations across all age groups and requiring awareness, advance preparation and adoption of preventive measures by all and for all. We are hopeful that some of the measures initiated by all stakeholders will result in improving the air quality and allowing us enjoy relatively fresh air.

Wishing you all a very Happy Diwali and New Year!

Nebraska Farmer ad for Penicillin from the mid-1940s.

Figure 1: Advertisement for Veticillin for the treatment of mastitis in the mid-1940s

resulted in the rapid expansion of new AGPs. This prompted many countries in Europe to license them for use without a veterinary prescription, for instance, West Germany (1951), Britain (1953), Netherlands (1954), and France (1955).[6,7]

As food production rose dramatically, so did serious public health concerns due to their role in driving AMR. The Netherthorpe Committee (1960) in Britain highlighted AMR proliferation in agriculture and recommended restrictions, while pressure from consumer groups and public health advocates in the United States led to monitoring programmes for milk contamination. In West Germany, concerns about residues prompted nationwide testing of meat by the mid-1970s.[9]

These developments slowly and gradually culminated in informed regulations. The European Union banned AGPs in 2006, and many other countries have since moved towards phasing them out. Nevertheless, AGPs remain in use in regions with rapidly growing livestock sectors, reflecting the continuing dependence on antibiotics in intensive food systems.

Current use of antibiotics in food production

In 2010, global antimicrobial consumption in livestock was estimated at 63,151 tonnes; projections indicate a 67% increase by 2030, reaching approximately 1,05,600 tonnes. This corresponds to a compound annual growth rate of 2.6%, nearly three times higher than the projected global population growth rate (0.98%) over the same period.[8] By 2030, antimicrobial consumption in the BRICS countries alone is expected to rise by 99% compared to human populations during the same time frame (Figure 2).[9]

While many high-income countries have already imposed full bans or partial bans on AGPs, rising incomes in countries such as India and China have fuelled unprecedented growth in demand for animal protein,[10] leading to a surge in intensive farming and AGP use. Consequently, the development of multi-resistant bacteria has been isolated in food animals at a higher frequency, especially in BRICS countries.[1]

Low- and middle-income countries often lack clear regulations, leading to higher risks of irrational or uncontrolled antimicrobial use. India illustrates this challenge despite having one of the world's highest burdens of bacterial disease and widespread antibiotic resistance (approximately 95% of adults carry bacteria resistant to β-lactams).[1]

The country administers antimicrobials at a rate much higher than the world's average and is expected to reach up to 40% more than the global average by year 2030. Studies in India have also found residues of antimicrobials in chicken, meat and milk, pointing to extensive, unregulated use.

India's Regulatory Landscape

Over the past two decades, India has introduced a series of regulations to address antimicrobial use in food animals and their link to AMR. The first major step came in 2007, when the Bureau of Indian Standards (BIS) recommended phasing out antibiotics used as growth promoters. In 2010, the Ministry of Health and Family Welfare (MoHFW) set up the National Task Force on AMR Containment, followed by India's endorsement of the Jaipur Declaration in 2011, which emphasised developing national antibiotic policies and surveillance systems.

By 2012, the Central Drugs Standard Control Organisation (CDSCO) had introduced withdrawal period norms for livestock and aquaculture products, while the Chennai Declaration the same year further galvanised stewardship efforts. In 2014, regulatory action expanded with amendments to the Food Safety and Standards (Contaminants, Toxins & Residues) Regulations, setting residue limits in meat, and the introduction of Schedule H1 to restrict over-the-counter antibiotic sales.

From 2015 onwards, India adopted a more structured approach through the National Programme on AMR Containment and the drafting of its National Action Plan on AMR (NAP-AMR), formally launched in 2017 with a One Health framework. The National Health Policy of 2017 also recognised the risks of using antibiotics as growth

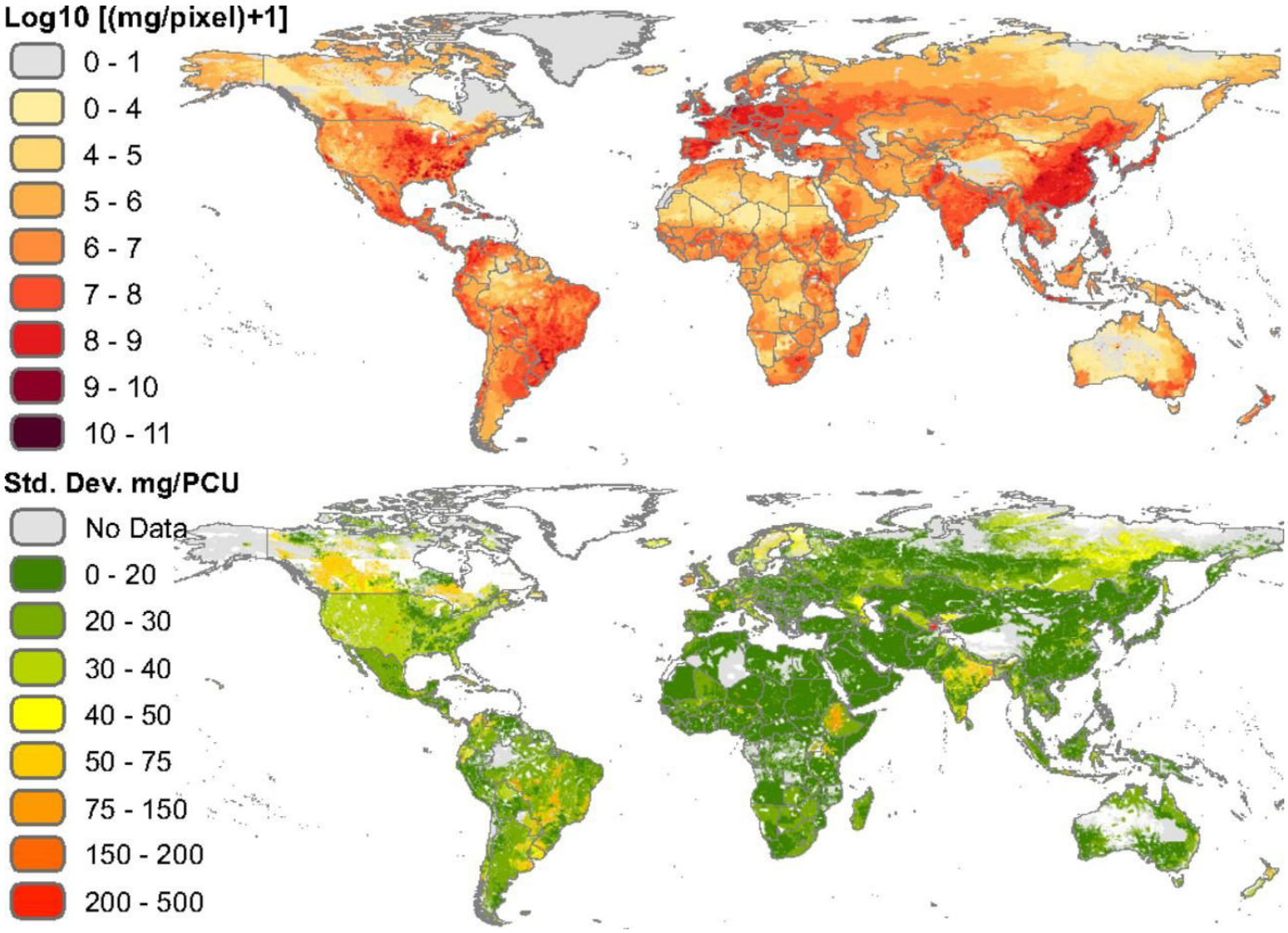


Figure 2: Global antimicrobial consumption in livestock in milligrams per 10 km2 pixels (Top) and average SD of estimates of milligrams per PCU (Bottom).

promoters, while FSSAI refined residue standards and tolerance limits for veterinary antibiotics.

A landmark decision came in 2019, when MoHFW prohibited the manufacture, sale, and distribution of colistin for use in food-producing animals, a move that aligned with global concerns about preserving this critical antibiotic. In 2021, the Central Pollution Control Board (CPCB) introduced guidelines on waste disposal from poultry and dairy farms to curb environmental contamination, further broadening the scope of regulation. In recent years, regulations have become significantly more stringent. In October 2024, the Food Safety and Standards Authority of India (FSSAI) banned the use of antibiotics at all stages of production across milk, meat, poultry, eggs, aquaculture, and honey, prohibiting entire antibiotic classes such as glycopeptides, nitrofurans, and nitroimidazoles, along with specific drugs like carbadox, chloramphenicol, colistin, streptomycin and sulfamethoxazole.

In March 2025, MoHFW extended prohibitions to chloramphenicol, nitrofurans, and their formulations, and by April 2025, further restrictions were introduced to align with EU norms, covering 34 antimicrobials used in animal production. Despite these strong measures, enforcement remains uneven. Toxics Link's report "Poultry's Pill Problem" (2024) highlight the continued availability of antimicrobial growth promoters in markets, underscoring the persistent gap between policy intent and ground-level implementation.

The Challenges

Poultry: India is the world's third-largest egg producer and fourth-largest chicken producer, with poultry emerging as the most consumed meat due to affordability and fewer cultural restrictions. However, nearly 70% of antibiotics used in poultry are used for growth promotion rather than treatment or prevention. This extensive non-therapeutic use has contributed to the rise of multidrug-resistant (MDR) and ESBL-producing E. coli in both industrial and backyard systems.[12]

A multi-state study found MDR bacteria in poultry litter, soil, and agricultural land, with resistance detected against all critically important antibiotics.[13] Toxics Link's 2024 report "Poultry's Pill Problem" confirmed similarly high levels of MDR bacteria in poultry samples.

Environmental contamination is another concern, as up to 90% of farm antibiotics are excreted into the environment and reused as manure or aquaculture feed, creating new reservoirs of resistance.[14] Despite these risks, reliable data on antibiotic use in Indian poultry remain scarce, reflecting weak surveillance.

Aquaculture: World's second-largest aquaculture producer, India, contributes to approximately 7% of the global fish output.[15] Production nearly doubled between 2013–14 and 2023–24, with per capita consumption also rising rapidly.[16] This growth has increased vulnerability to diseases such as white spot virus, EHP, and white faeces disease, leading farmers to rely heavily on antibiotics, including unapproved ones.

The INFAAR surveillance study (2019–22) found high levels of resistance across shrimp farms, with S. aureus and Coagulase-negative Staphylococci showing >90% resistance to penicillin, and V. parahaemolyticus showing over 50% resistance to ampicillin.[17] Recognising these risks, regulators have acted more swiftly in aquaculture than in other sectors: the Coastal Aquaculture Authority tightened antibiotic guidelines in 2024, and in May 2025, the Ministry of Commerce and Industry banned several medically important antimicrobials in aquaculture.[18]

Dairy: India is the world's largest milk producer, with dairy forming a daily staple for nearly half the population.[19] The sector's AMR burden stems mainly from the overuse of antibiotics to treat mastitis, a common infection in high-yielding animals. Withdrawal periods are often ignored, leading to antibiotic residues in milk. A meta-analysis found Staphylococcus spp. to be the most common mastitis-causing bacteria (45% of cases),[20] with resistance reported to penicillin, tetracycline, erythromycin, streptomycin, and ampicillin.[21] Factors such as poverty, illiteracy, and reliance on untrained quacks exacerbate misuse. Resistant bacteria and residues spread through milk, handlers, farm environments, manure, and processing systems, further entrenching AMR in the food chain.[22]

AMR Mitigation

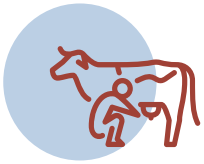
Antibiotic misuse in food production not only threatens public health but also jeopardizes India's food security and export markets. Addressing it requires a balanced approach combining regulation, farmer support, and consumer awareness.

– *The author is Senior Programme Officer, Chemicals and Health, Toxics Link*

REFERENCES:

1. https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance
2. https://www.nobelprize.org/uploads/2018/06/fleming-lecture.pdf
3. Lesch JE (2007) The first miracle drugs. How the sulfa drugs transformed medicine. Oxford University Press, Oxford
4. Landecker H (2017) The food of our food: Medicated feed and the industrialisation of metabolism (Keynote, Oxford, Keble College—Oxford Interdisciplinary Microbiome Project Workshop—15 Feb 2017)
5. Finlay MR (2004) Hogs, antibiotics, and the industrial environments of postwar agriculture. In: Scranton P, Schrepfer SR (eds) Industrializing organisms. Introducing evolutionary history. Routledge, London, pp 237–260
6. Thoms U (2012) Between promise and threat. antibiotics in foods in west Germany 1950–1980. NTM 20:181–214
7. Kirchhelle C (2018) Swann song British antibiotic regulation in livestock production (1953–2006). Bull Hist Med 92:317–350
8. Van Boeckel, T. P., Brower, C., Gilbert, M., Grenfell, B. T., Levin, S. A., Robinson, T. P., Teillant, A., & Laxminarayan, R. (2015). Global trends in antimicrobial use in food animals. Proceedings of the National Academy of Sciences, 112(18), 5649–5654. https://doi.org/10.1073/pnas.1503141112
9. World Bank. Available at data.worldbank.org. Accessed August 20, 2025.
10. D Tilman, C Balzer, J Hill, BL Befort, Global food demand and the sustainable intensification of agriculture. Proc Natl Acad Sci USA 108, 20260–20264 (2011).
11. TR Walsh, J Weeks, DM Livermore, MA Toleman, Dissemination of NDM-1 positive bacteria in the New Delhi environment and its implications for human health: An environmental point prevalence study. Lancet Infect Dis 11, 355–362 (2011).
12. Hedman, H. D., Vasco, K. A., & Zhang, L. (2020). A review of antimicrobial resistance in poultry farming within low-resource settings. Animals, 10(8), 1264.
13. Bhushan, C., Khurana, A., Sinha, R., & Nagaraju, M. (2017). Antibiotic resistance in poultry environment: Spread of resistance from poultry farm to agricultural field. Centre for Science and Environment, 36.
14. https://pubmed.ncbi.nlm.nih.gov/21546307/
15. https://nfdb.gov.in/PDF/Fish%20&%20Fisheries%20of%20India/1.Fish%20and%20Fisheries%20of%20India.pdf
16. https://www.pib.gov.in/FactsheetDetails.aspx?Id=149135#:~:text=Increase%20in%20Production:%20Fish%20production,tons%20(2004%2D14).
17. FAO. ICAR (2024) Surveillance data of the Indian Network for Fishery and Animal Antimicrobial Resistance (INFAAR) — An analytical report 2019—2022. New Delhi. https://doi.org/10.4060/cc9303en
18. https://www.legalitysimplified.com/wp-content/uploads/2025/05/Amendment-to-export-Fresh-Frozen-and-Processed-Fish-and-Fishery-Products.pdf
19. https://apeda.gov.in/AnimalProducts
20. Krishnamoorthy P, Suresh PK, Saha S, Govindaraj G, Shome BR, Roy P. Meta-analysis of prevalence of subclinical and clinical mastitis, major mastitis pathogens in dairy cattle in India. Int J Curr Microbiol Appl Sci. 2017;6:1214–34. https://doi.org/10.20546/ijcmas.2017.603.141.
21. Sharma, I., & Brinty, A. (2014). Isolation and identification of Staphylococcus aureus from bovine mastitis milk and their drug resistance patterns in Silchar town dairy farms, NE India. Online International Interdisciplinary Research Journal, 4, 256–260.
22. https://indiandairyassociation.org/ID-Article-Abstract.aspx?aid =Mzly&ino=NT%3D#:~:text=AB STRACT,resource%20working%20in%20dairy%20chai

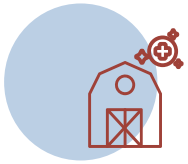
Measures to help combat AMR



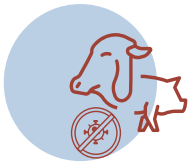
Strengthening husbandry practices: Training farmers in good animal handling and management practices, especially in small-scale and backyard poultry farms, where poor biosecurity often leads to frequent antibiotic use.

Improving animal welfare: Ensuring adequate ventilation, clean water supply, sufficient space, and reduced crowding—particularly in India's poultry sector, where high stocking density is common.

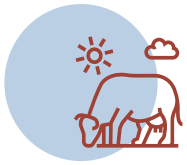
Breeding and genetics: Promoting the use of locally-adapted breeds such as Kadaknath chicken or indigenous cattle breeds, which are often more disease-resistant and require fewer antimicrobials than exotic high-yield breeds.



Enhancing farm hygiene and biosecurity: Introducing low-cost biosecurity measures for smallholders, such as footbaths, controlled farm access, and regular cleaning of housing. Improved transport conditions for animals (often neglected in India) also help reduce stress and infection risks.



Rigorous disease control: Expanding vaccination coverage in poultry and dairy sectors, where vaccines are available but underutilised. For example, Newcastle Disease (ND) vaccination in poultry can significantly reduce disease burden and antibiotic misuse.

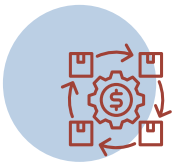


Alternative growth promoters: Promoting safer alternatives to AGPs such as probiotics, prebiotics, enzymes, herbal feed additives (e.g., neem, tulsi, garlic extracts), and essential oils—options that align with India's strong tradition of ethnoveterinary practices.

Feed quality improvement: Reducing dependence on low-quality feed containing antinutritional factors by ensuring proper formulation, inclusion of micronutrients, and better storage practices to prevent fungal contamination (e.g., aflatoxins, which weaken immunity and trigger antibiotic use).

Waste management: Introducing proper systems for manure treatment and disposal to prevent antimicrobial residues and resistant bacteria from contaminating soil and water. In India, untreated poultry litter is often used directly as fish feed or fertilizer, which spreads resistant microbes.

Regulatory enforcement and awareness: Strict implementation of India's 2019 ban on colistin as a growth promoter, stronger monitoring of over-the-counter veterinary antibiotic sales, and awareness campaigns for farmers and veterinarians to discourage misuse.



Value chain interventions: Working with feed manufacturers, integrators, and large poultry producers to reduce antibiotic-laced feeds, while incentivising antibiotic-free production for consumer markets. Retailers and exporters can play a strong role in driving compliance.

Capacity building and incentives: Providing farmers with training and financial support to adopt better practices, and recognising antibiotic-free farming through certification schemes to create consumer trust and economic benefits.

E-Waste Recycling and EPR in India: Circular Solution or Greenwashed Illusion

Recycling is important, but not enough. It only deals with waste after it has been created. The focus should not only be on disposal but the entire journey—from design and production to use, reuse, and recycling.

By Anjali S. Nair

India is racing ahead in the digital age. From smartphones and laptops to home appliances, electronic gadgets have become a part of our everyday life. But there is a hidden side to this growth: the rising piles of electronic waste, or e-waste.

Unlike normal household waste, e-waste management is tricky. While it contains dangerous chemicals that can pollute soil, water and air, it also contains valuable metals that can be reused if managed properly.

The problem is escalating rapidly. India's e-waste generation almost doubled, jumping from 7.08 lakh tonnes in 2017-18 to 13.98 lakh tonnes in 2024-25.[1] This means that even though official records show more e-waste being recycled, as the overall waste being generated is rising, the problem is getting worse and is unlikely to be resolved soon.

With higher incomes and rapid lifestyle changes, people now prefer to buy new gadgets rather than repairing old ones. This "use-and-throw" habit has made India one of the biggest e-waste generators in the world.

What is E-Waste?

E-waste simply means old or broken electrical and electronic items that are no longer useful—like phones, computers, televisions, and kitchen appliances.

But calling it "waste" may be misleading. These discarded items are full of:

- Precious metals like gold, silver and platinum
- Base metals such as copper, aluminium and iron
- Toxic heavy metals including lead, mercury and cadmium

Mining these metals from nature requires huge amounts of energy and also damage to the environment. Recycling them from e-waste is cheaper, cleaner, and safer—albeit done properly.

Recycling Alone is Not Enough

Recycling is important, but it only deals with waste after it has been created. If products keep breaking quickly and if people keep buying new ones instead of repairing, recycling cannot solve the bigger problem. This is why we need the circular economy approach. Instead of focusing only on disposal, it looks at the entire journey of electronic products—from design and production to use, reuse, and recycling.

Key Principles of the Circular Economy in E-Waste Management

- Design for Longevity and Repairability – Products should be built to last long and easy to repair, reducing premature disposal.
- Reuse and Refurbishment – Extending the life of devices through second-hand use, refurbishment, and resale.
- Recycling and Material Recovery – Extracting valuable resources from discarded electronics to re-enter the production cycle.
- Extended Producer Responsibility – Holding manufacturers accountable for safe collection, recycling, and disposal of their products.
- Product-as-a-Service (PaaS) Models – Instead of buying a product, people can use it as a service (through renting, leasing, or subscriptions). The company stays in charge of repair and recycling, which cuts down waste.

Extended Producer Responsibility: A Policy Backbone

Among the different steps to make electronics more circular, one of the most important is holding producers accountable. In India, this is done through a policy called Extended Producer Responsibility (EPR).

First introduced in 2012 and strengthened under the E-Waste (Management) Rules 2022, EPR mandates producers to take responsibility for their products even after they are discarded—ensuring environmentally sound collection, recycling, and disposal. In 2025, the government also introduced minimum and maximum price caps on EPR credits to discourage underbidding and encourage safer recycling practices.

While these measures represent important progress, challenges in effective implementation continue to limit the overall impact of EPR. Key concerns include delays in producer and recycler registrations, weak monitoring of compliance data on the EPR portal, narrow recovery targets that leave out plastics and rare earths, and limited inclusion of India's vast informal recycling workforce.

The Challenges

Despite policy advances, systemic weaknesses undermine India's e-waste recycling framework.

- Fake recycling plants: Several licensed e-waste recycling plants exist only on paper. Some are missing, shut down, or repurposed—yet show high recycling figures. This manipulates compliance figures without real recycling.
- Paper compliance, not real action: To show activity, truckloads of e-waste are moved to short distances. Companies pretend to be meeting EPR targets while little or no processing actually is taking place.
- Low price bids undermine standards: Some recyclers offer very low rates (Rs. 5.90/kg), much lower than the government's set minimum (Rs. 22/kg) or the real cost (Rs. 12–16/kg). This raises risks of unsafe or poor-quality recycling.
- High compliance burden: Producers argue the focus on compliance paperwork shifts attention away from

innovation and circular design.

- Weak Reverse Supply Chains: Collection networks are fragmented, with leakages that divert large quantities to informal handlers.
- Low Consumer Awareness: Most consumers are unaware of safe disposal channels. This reduces collection efficiency.

Towards a Circular Future

E-waste recycling can move closer to circularity if key reforms are made. Building on stakeholder consultations, the following steps are crucial:

- Improve Data Transparency and Verification – Make compliance data public, subject it to audits, and reduce reliance on self-reporting.
- Expand Stakeholder Coverage – Ensure that micro-manufacturers, importers, and the informal sector are formally integrated into the EPR framework.
- Strengthen Reverse Supply Chains – Build robust, nationwide collection systems that prevent leakages.
- Enhance Consumer Awareness – Launch awareness campaigns to encourage responsible disposal of gadgets.
- Incentivise Product Longevity and Quality Recycling – Encourage eco-design, repairability, and high-standard recycling practices through tax breaks or credits.

Conclusion

E-waste management in India stands at a crossroads. On one hand, policies like EPR and circular economy principles offer a pathway towards sustainable handling of discarded electronics. On the other, weak enforcement, ghost recyclers, and cost-cutting practices show how easily recycling can be greenwashed.

Recycling alone cannot solve the challenge. What India truly needs is a cultural and systemic shift—products designed to last, consumers choosing repair and reuse, companies made fully accountable, and regulators ensuring strict compliance.

If these gaps are closed, e-waste can move from being a toxic burden to becoming a valuable resource stream. Until then, India's e-waste recycling will remain caught between the promise of a circular solution and the danger of being just another illusion.

– The author is Senior Programme Officer, Waste and Sustainability, Toxics Link

REFERENCE:

https://factly.in/indias-e-waste-generation-doubles-in-8-years-but-processing-remains-skewed

Textile Waste Economy: How Circular?

India has become a global hub for processing textile waste, attracting waste imports from other countries. While Panipat is celebrated for its achievements in recycling imported waste, the associated environmental and health risks are rarely discussed.

By Senerita Swamy

The rapid expansion of the global textile and apparel industry, driven by rising consumption and fast fashion trends, has led to an increase in textile waste generation worldwide. Shortened product life cycles, low-cost synthetic materials and mass production have resulted in clothing being discarded at a faster rate than ever before. According to global estimates, over 92 million tonnes of textile waste are generated each year, with the majority ending in landfills or being incinerated. This not only consumes valuable landfill space but also releases greenhouse gases and toxic chemicals, creating a mounting environmental and public health concern.

India, being a highly populated country, consumes more apparel and generates a huge quantity of textile waste. More than one million tonnes of textile waste are thrown away every year in India. The existing system for producing, supplying and wearing clothes operates in an almost entirely linear pattern. It is reckoned that well over half of all fashion and/or fast fashion manufactured is discarded in less than a year. Consequently, massive quantities of non-renewable resources are exploited to produce clothes that are frequently used only for a relatively limited period, after which the materials are mostly dumped in the landfill or incinerated. Textile waste in India arises primarily in three waste generation streams: (1) pre-consumer, i.e. waste generated before the finished products reach the consumers and includes waste types such as spinning waste, fabric trimmings/cuttings, fabric deadstock, and unsold garment inventory; (2) domestic post-consumer, i.e. garments/textiles discarded by domestic consumers; and (3) imported waste stream, which includes second-hand clothing and mutilated rags imported to India.

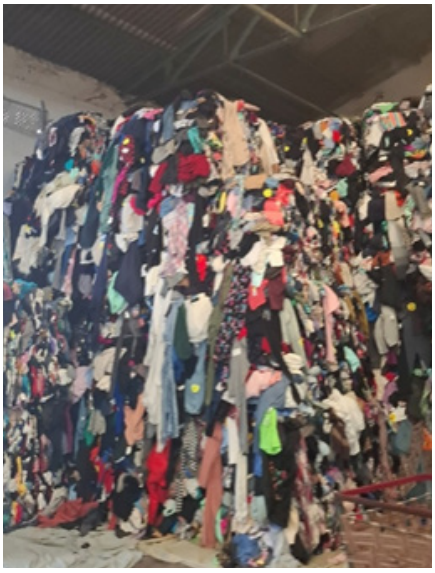
Mapping the Import of Textile Waste

Mapping the import of textile waste reveals that the biggest challenge stems from the scale of international waste shipments. Developed countries export large volumes of used garments to India with Mundra Port serving as the primary entry point. These imports are processed at the Kandla Special Economic Zone (KA-SEZ) in Gujarat, where textiles are meticulously sorted by quality, type, and demand in global markets. High-quality garments are repackaged and re-exported to African nations, including Kenya, Ghana, Uganda, and the Democratic Republic of Congo, as well as Southeast Asian countries like the Philippines, Malaysia and Thailand. While neighbouring Bangladesh restricts such imports to protect its domestic industry, other regions remain dependent on this trade. Good-quality garments, particularly white textiles, are also sent to Europe for recycling into sustainable products like fibres and industrial wipes.

India's trade protocols require that at least 50% of imported textiles are re-exported, with the rest allocated for domestic processing. Unlike plastic waste, which faces stringent regulations, textile waste slips through a regulatory void, with hazardous waste rules applied only to non-compliant consignments. Each month, an overwhelming 500–600 tonnes of used textiles surge through Mundra, eclipsing domestic textile collection and recycling efforts. At Kandla Special Economic Zone (KA-SEZ), aggregators sort this influx: reusable garments are channelled into weekly markets, while unusable fabrics are shredded into mutilated rags, converted into upcycled yarns, and crafted into carpets and home goods for global markets. While this import-driven recycling model fuels economic gains, it threatens local livelihoods and environmental sustainability. The relentless tide of imported textile waste demands urgent, robust regulations to protect India's economic and ecological future, ensuring global trade does not undermine domestic responsibility.

Emerging Recycling Hub

Panipat, widely recognised as Asia's largest textile and recycling hub, plays a pivotal role in managing textile waste. The city is home to more than 300 small and medium-sized enterprises that process both post-consumer and post-industrial waste sourced from local markets as well as imports. On an average, single medium size unit deals with 25 tonnes of textile waste. Every day, approximately 250 tonnes of textile waste arrive in Panipat, where it is carefully sorted by hand into different categories before being either prepared for resale or recycled into a variety of products.



Textile waste

Similarly, Amroha in Uttar Pradesh stands out as an important centre for textile recycling, further reinforcing India's leadership in this sector. With a cluster of textile businesses dedicated to waste processing, the city handles significant amounts of cotton waste, fabric scraps, and recycled cotton fibre. With decades of experience in textile recycling, India has become a global hub for processing textile waste, attracting waste imports from other countries. This growing reputation has not only boosted India's economy but also created numerous employment opportunities. However, this success has come at a cost. While cities like Panipat celebrate their achievements in recycling imported waste, the associated environmental and health risks are rarely discussed. International frameworks like the Basel Convention, which regulate hazardous waste trade, do not explicitly cover textile waste though plastic waste remains a prominent global issue, with its environmental impacts actively debated.

Microplastics and Chemicals: India's Toxic Textile Crisis

Polyester, accounting for 35% of global microplastic pollution, sheds non-biodegradable microfibres during washing especially in early cycles, devastating India's rivers, soils, and oceans, according to Toxics Link report *Dirty Laundry: Threads of Pollution – Microfibres*. The report further states toxic chemicals like PFAS, heavy metals, and formaldehyde-laden dyes permeate these textiles, with hazardous substances from pesticides in fibre cleaning to solvents in washing infiltrating the entire production cycle. Mechanical recycling processes, such as shredding and washing in hubs like Panipat and Amroha, worsen the crisis by releasing microfibres and chemical residues into air and water, amplifying environmental degradation. Overwhelmed by massive volumes of imported textile waste, these centres expose workers and nearby communities to toxic dust, fumes, and chemical runoff, with many workers reporting respiratory issues, skin irritation, and long-term health concerns like chronic diseases.

Current standards, such as the Global Organic Textile Standard, scarcely address chemical additives and ignore microplastic shedding, while Life Cycle Assessments and labelling schemes fail to account for these pollutants, stalling mitigation efforts. A bold, urgent strategy, driven by consumer demand for advanced filtration systems, stringent chemical regulations, and reduced reliance on imported synthetics, must prioritise repair and reuse to extend garment lifespan. This is critical to curbing the catastrophic environmental and health impacts of microplastic and toxic pollution and halting the tidal wave of imported textile waste drowning India's ecosystems and communities.

Illegal Bleach and Dye Effluents Polluting Rivers

In 2025, the Haryana State Pollution Control Board shut down 30 illegal bleaching units in Panipat for flouting effluent treatment rules and poisoning the Yamuna River with toxic runoff. Similar crackdowns are under way nationwide, enforcing strict wastewater regulations. These rogue units,

Sorting unit in Panipat

operating without permits, use crude pits lined with plastic sheets, deploying hydrochloric acid and bleaching powder to whiten rags. Caustic fumes from these pits endanger workers and communities while open-air yarn drying and absent wastewater management let toxic effluents contaminate groundwater and the Yamuna. These reckless practices demand urgent enforcement of modern, eco-friendly standards to halt the environmental and health devastation caused by illegal textile operations.

These effluents, combined with harmful dyes, expose workers to dangerous chemicals such as corrosive sulphuric acid and bleaching powder without proper safety measures. The Central Pollution Control Board (CPCB) has repeatedly identified textile dyeing as one of the most polluting industries, responsible for nearly 60% of untreated industrial wastewater in India. Such practices not only threaten ecosystems and water bodies but also put workers' health at severe risk, undermining claims of eco-friendly recycling efforts.

From Economic Benefit to Environmental Burden

The textile industry's ambition to enhance material efficiency is crippled by the absence of standardised regulations for product durability and lifespan. Without clear guidelines, promoting the reuse and repair of clothing, essential for curbing waste and fostering sustainable consumption, remains elusive. Currently, only a small fraction of textiles is collected for recycling or upcycling, with the vast majority dumped in landfills, intensifying environmental harm. This crisis is worsened by the influx of cost-effective imported reused textiles flooding local markets, which boosts consumer purchasing power and drives rampant overconsumption.

The affordability of these imports fuels a vicious cycle of hoarding low-quality international textile waste, much of which ultimately clogs Indian landfills. The lack of durability standards, coupled with unchecked import-driven consumption, derails the industry's transition to a circular economy. Urgent policy reforms are critical to enforce durability standards, promote sustainable production, and stem the tide of textile waste overwhelming India's environmental and economic landscape.

The lack of clear rules on how long clothes should last makes it harder for the industry to move towards a circular economy. Policies need to set clear durability standards to help people use garments for longer. This would reduce waste and lessen the environmental impact of the textile industry.

Equally concerning is the absence of a clear definition of high-quality fabrics, which undermines efforts to enhance material efficiency. While durable, high-quality textiles are often cited as essential for sustainability, the industry lacks specific criteria to differentiate them from low-quality, fast-fashion materials that dominate markets. Similarly, there is insufficient focus on recycled or natural fibre content, despite their importance for recyclability. Mixed fibres, prevalent in many textiles, complicate recycling processes, yet single-fibre materials that improve circularity are underutilised. Establishing standardised definitions for fabric quality and promoting higher recycled or natural fibre content could drive sustainable production and reduce the environmental footprint of textile waste.

Think Beyond Recycling

India's push to expand recycling capabilities is often celebrated as a step towards sustainability, but this narrative is dangerously misleading. Recycling, though valuable, fails to address the root causes of environmental degradation and inadvertently fuels the fast-fashion cycle by making cheap, disposable clothing more accessible. The true cost is borne by nature, with microplastics, toxic chemicals, and resource depletion ravaging ecosystems. To break this cycle, India must incentivise brands and manufacturers to pivot to biodegradable natural fibres (such as cotton, hemp, linen, jute, wool, and silk) and low-impact alternatives like organic cotton, bamboo, and Tencel/Lyocell. Eco-design principles prioritising durability, repairability, and recyclability must become industry standards. Mandatory fibre labelling is essential to empower consumers to choose sustainable textiles and enable recyclers to process fabrics efficiently.

Relying solely on recycling as a sustainability fix masks its environmental and health tolls from micro fibre pollution and toxic residues to worker exposure. India must reject outdated methods and short-term profits, embracing a transformative vision that modernises its textile industry. By prioritising durability, safety, and resource efficiency, the nation can shift from fleeting economic gains to long-term environmental stewardship, forging a resilient, sustainable textile ecosystem that protects both people and the planet.

Conclusion

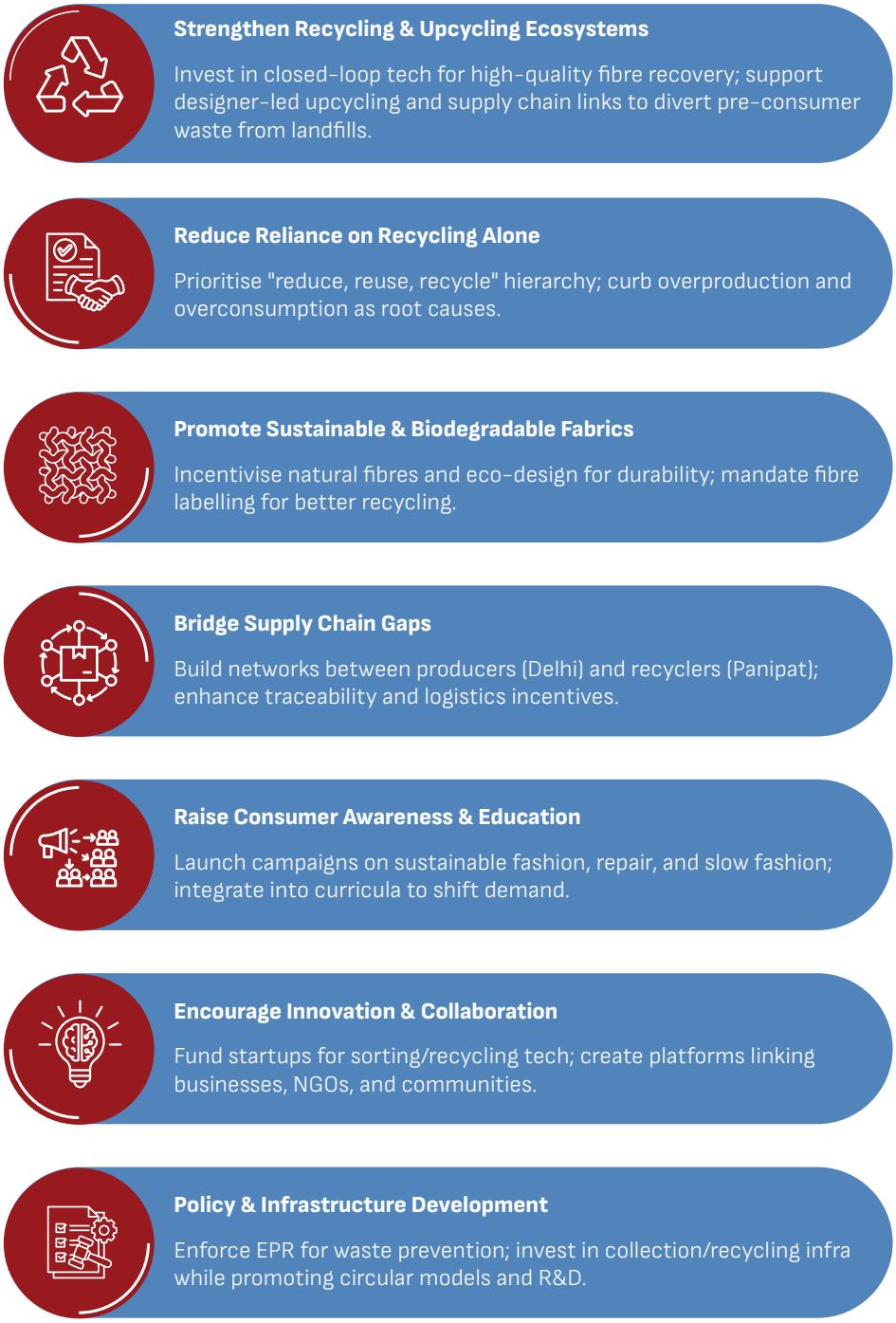
Textile waste management in India is at a critical point. While recycling and upcycling efforts are growing, they alone cannot address the crisis due to limitations with synthetic fibres, fabric blends, and quality loss. A sustainable approach requires focusing on reducing overproduction, promoting reuse, and encouraging biodegradable fabrics.

The global textile supply chain, spanning continents, creates a significant carbon footprint. Environmentally sound management, prioritising localised sourcing, circular design, and closed-loop recycling to minimise emissions and waste are essential. In-depth lifecycle assessments are needed to fully understand the pros and cons of current processes and to identify effective solutions, such as regional production hubs and advanced recycling technologies, to overcome these challenges. Investments in recycling technologies, policies, and infrastructure are crucial for managing unavoidable waste. Collaboration between government, businesses, and consumers can transform waste into a valuable resource, advancing environmental and economic goals.

— The author is Programme Officer, Waste and Sustainability, Toxics Link

REFERENCES:

1. Toxics Link. Dirty Laundry: Threads of Pollution — Microfibres. Toxics Link
2. Eurostat. Household Consumption by Purpose. European Commission, 27 Nov. 2024,
3. Fashion for Good, et al. "India's Untapped Potential for Circularity of Textile Waste." Wealth in Waste: India's Potential to Bring Textile Waste Back into the Supply Chain, Fashion for Good, July 2022
4. Singh, Tanupriya, and Srishti Gupta. "Building Circularity in Post-Consumer Textile
5. Waste Management." India Development Review, 13 Aug. 2025, India Development Review



CLIMATE CHANGE SERIES

PUBLIC LECTURE

Addressing Climate Change with a Just Transition to Clean Energy

Toxics Link, in collaboration with the India International Centre (IIC), organised a Public Lecture on "Addressing Climate Change with a Just Transition to Clean Energy" on September 3, 2025, at IIC in New Delhi. It was the third in the series of lectures on climate change. In the panel were Dr Atul Kumar, Professor, Energy Studies Programme, Jawaharlal Nehru University, Dr Debajit Palit, Centre Head-Centre for Climate Change and Energy Transition, Chintan Research Foundation (CRF) and Mr Karthik Ganesan, Fellow and Director-Strategic Partnerships, Council on Energy, Environment and Water (CEEW). Toxics Link Associate Director Mr Satish Sinha moderated the session.

Read full report: https://toxicslink.org/publications/public-lectures/public-lecture-on-addressing-climate-change-with-a-just-transition-to-clean-energy

India's Adaptation and Mitigation Strategies for Climate Change

The second in the climate series was a lecture on "India's Adaptation and Mitigation Strategies for Climate Change" held on June 4, 2025, at IIC in New Delhi. The panel included Dr S. Sreekesh, Professor, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University; Ms Urmi Goswami, Assistant Editor, Economic Times; and Mr Ravi Agarwal, Founding Director, Toxics Link, who moderated the discussion.

Read full report: https://toxicslink.org/publications/public-lectures/public-lecture-on-indias-adaptation-and-mitigation-strategies-for-climate-change

Pic: Pexels

INTERVIEW

In a tête à tête with Subbaih Nallamuthu

Winner of many national and international awards, Subbiah Nallamuthu is known for for his contributions to wildlife cinematography and passion for filming the "Royal Bengal Tiger". He filmed and directed "The World's Most Famous Tiger", a film based on the legendary tigress Machli of Ranthambore National Park, chronicling her life from her prime to her final days. The filmmaker tells us the tiger taught him humility, patience, courage, and how to connect with people through stories.

TL: Toxics Link: How and when did your journey of wildlife filmmaking start?

Subbiah Nallamuthu: After graduating from film school in Chennai, I worked at Indian Space Research Organisation (ISRO) Sriharikota as a high-speed cinematographer, filming rockets and birds in flight. Later, I worked in the Tamil film industry and in rural communication projects, but eventually left a secure job to tell my own stories of the wild - self-funded, without institutional support. But my journey began not with a camera, but with an emotion - the awe of locking eyes with a tiger for the first time. That gaze taught me courage: to stand on my own, to be patient, and to connect with people through stories in their own language. The tiger was my first teacher in storytelling.

TL: Was your focus on tigers a coincidence or conscious choice?

Machli, the legendary tigress of Ranthambore, was more than a subject - she was my guide. By following her from prime to death, I learnt resilience, patience, and the dignity of decline. Later, Maya's story—losing all her daughters—reflected grief, endurance, and the fragility of life. It was never a coincidence; tigers kept drawing me back. They became metaphors for wilderness itself. The tiger taught me that strength is not about domination, but about balance, sacrifice, and grace.

TL: What are the unique challenges of wildlife filmmaking?

The greatest hurdle is time. Nature doesn't perform on cue, and in India we are confined to tourism zones and short filming windows. Once, I waited two months for a climax, only to have the monsoon shut the forest. The tiger taught me patience. It waits silently before striking, never wasting energy. That discipline shaped my work. Beyond logistics, the deeper challenge is to remain sensitive—to not reduce the tiger to spectacle, but to make its story reach both global audiences and forest-edge communities in their own language.

TL: Your perspective on man-animal conflict, can films help?

Conflict is not man versus tiger—it is man versus his own choices. When a villager loses cattle, it is the ecosystem speaking, reminding us of the fragile balance. The tiger taught me coexistence. Despite being an apex predator, it shares its space with leopards, bears, and even people. If it can balance, so can we. Films help when they are told in people's dialects. When a villager feels proud of "her tiger", pride replaces fear and pride is the first step towards harmony.

TL: How has your perspective on the environment changed?

Earlier, I saw the forest as a backdrop. Today, I see it as the central character. The tiger taught me that its survival depends not just on prey, but on rivers, trees, and people. Science gives us data, but stories turn that data into feelings. The tiger showed me that survival is always about interdependence. The forest, its creatures, and people at its edge are inseparable.

TL: Your view on pollution and toxic contamination's impact?

Pollution is silent violence. I have seen rivers that once carried fish, crocodiles, and songs turn into poisoned drains. Toxic contamination is not just a scientific problem, it is a cultural wound. When rivers die, communities lose rituals, memory, and identity. The tiger taught me purity. It wastes nothing, contaminates nothing. Every act of its life is precise and clean. That discipline is a reminder of how careless humans have become with plastics, chemicals, and waste.

TL: Can documentaries catalyse change?

Yes, but only if they step out of film festivals and OTT platforms, and enter villages and schools. A law in a city may look powerful, but the real change begins when a child near the forest says: "That tiger is mine to protect." The tiger taught me to begin small. It guards its cubs before it guards the forest. Films too must touch individual hearts before they can move systems.

Artwork by Treya Mukherjee

TL: How has wildlife filmmaking changed in the digital era?

Digital media has liberated us. A one-minute film on a phone can move people more than a one-hour documentary in Europe. OTT platforms may chase celebrity glamour, but digital democracy allows every person to tell their own tiger story. The tiger taught me adaptability. It survives drought, flood, and shifting prey. In the same way, I must adapt to formats — long films, short reels, or immersive clips. The story remains the same; only the tools change.

TL: What are you working on in Ranthambore now?

My wife and I have started My Dear Tiger, a homestay and storytelling centre, along with Nalla's Ark Experience Centre - a nonprofit hub for tiger stories, films, and community voices. It is not a resort but a living archive. Each room is dedicated to a legendary tiger I followed, so guests live with stories. The tiger taught me legacy. Its memory outlives its life when the story is preserved. Through this centre, we want to create meaningful, sustainable tourism where every stay funds more films, archives, and community engagement.

TL: Did you never want to be a commercial filmmaker?

Yes, I tried. I pitched a feature film about a forest officer saving tigers. But mainstream actors wanted to play tiger-killers instead of protectors. That rejection clarified my path. The tiger taught me persistence. Like it waits hours for one chance to strike, I too wait for the right time. Meanwhile, my cinema plays daily in the forest — tigresses raising cubs, males fighting, deer on alert. Why trade real drama for artificial scripts?

TL: Do today's youth have passion for documentaries?

Yes, the passion is there — but it needs guidance. Many chase Instagram aesthetics, compiling others' footage or posing instead of seeking original stories. The tiger taught me discipline. It walks miles for one clean hunt, never distracted. If young filmmakers follow this lesson—patience over shortcuts—their films will last. True storytelling is not about likes, but about truth.

TL: Your message to budding filmmakers and conservationists?

Don't preach; tell stories. Speak in your people's language. Begin in your backyard. If you can film a sparrow or a stream and make a neighbour smile, you have already begun. The tiger taught me humility. It roars rarely, lives lightly, and protects silently. That is real conservation. Every story we tell must reduce toxicity, not only in our rivers and forests, but also in the way we live, share, and care.

STUDENTS CORNER

Submerged Cities: India's Waterlogging Woes

— By Bivek Das

Cities in India must upgrade their drainage networks, overhaul their waste management practices, restore natural ecosystems, and actively involve local communities in planning and execution

Waterlogging in India has transformed from a mere seasonal nuisance into a pressing urban emergency. Year after year, visuals of submerged roads in cities like Mumbai, Bengaluru, Delhi, and Chennai flood the media, reflecting more than just temporary disruption—they reveal deeper issues tied to climate change, fragile infrastructure, and mismanaged urban planning. What was once a short-lived inconvenience has now become a persistent threat to economic development, public health, and the long-term viability of urban centres where millions inhabit.

Changing Weather Patterns and the Flooding Challenge

One of the biggest reasons why waterlogging has worsened in recent years is the change in rainfall patterns. Instead of the steady, predictable monsoons of the past, Indian cities now often experience short but intense downpours. A study by Indian Institute of Technology (IIT) Gandhinagar highlights that these short-duration extreme rain events are becoming more frequent and more powerful, with rainfall volumes during storms expected to rise by as much as 20-25% if global temperatures continue to climb by 1.5 to 2 degrees Celsius.

India's urban drainage infrastructure is largely outdated, constructed keeping rainfall patterns from decades ago in mind. Mumbai serves as a stark example—its drainage system was originally designed to manage just 25 mm of rain per hour. Today, the city frequently experiences cloudbursts exceeding 100 mm within the same period. Such intense downpours overwhelm the system, causing it to fail and resulting in widespread flooding across entire localities.

To make matters worse, the urban heat island effect—where densely built environments trap heat—can locally intensify rainfall. This phenomenon further heightens the risk of flash floods, leaving cities increasingly exposed to climate-driven extremes.

When Waste Blocks the Flow

Even where drains exist, they often do not function as they should. Poor waste management is one of the hidden but major reasons behind chronic waterlogging. Solid waste like plastic bags, food wrappers and construction debris, choke drainage channels. In a city like Mumbai, which produces over 9,000 tonnes of garbage every single day, this becomes a huge problem. Studies suggest that clogged drains can lose as much as 40-60% of their water-carrying capacity, which means even moderate rains, can paralyse the system.

The crisis runs deeper than just clogged streets. In India, only about 29% of urban wastewater undergoes treatment—leaving the majority to spill unchecked into rivers, lakes, and open drains. When monsoon floods hit, this untreated sewage merges with rainwater, forming stagnant pools teeming with disease-causing pathogens. These contaminated waters become breeding grounds for mosquitoes, fuelling outbreaks of dengue, malaria, and cholera.

For city dwellers, the impact goes far beyond temporary inconvenience. It's a growing public health hazard, a threat to property, and a drain on the economy—costing thousands of crores in lost productivity and recovery efforts each year.

Crumbling Infrastructure and the Problem of Backflow

Infrastructure itself is another weak link in the story of urban waterlogging. Many Indian cities still rely on old sewer systems designed for a fraction of today's urban population. Smaller sewer pipes, in particular, play a big role in causing flooding. During heavy rains, when large volumes of storm water suddenly enter the sewer system, these narrow pipes cannot handle the flow. Water then finds its way back to homes, streets and commercial areas. Engineers call it "backflow" or reverse water flow.

Several factors make this worse: silt and debris that choke pipes, combined sewer lines where stormwater and

sewage flow together, and decades-old pipes corroded by time. In practice, this means that what flows back is often not just rainwater but a mix of sewage and floodwater—turning waterlogging into a public health hazard. For people living in low-lying areas, this cycle of flooding and contamination has become a predictable, yearly ordeal.

Vanishing Lakes, Wetlands, and Floodplains

The crisis of waterlogging cannot be separated from the way Indian cities have treated their natural water bodies. Traditionally, wetlands, lakes, and floodplains acted like natural sponges, absorbing excess rainfall and preventing floods. But in the race towards rapid urbanisation, these ecosystems have been encroached upon or filled up to make way for roads, housing complexes and commercial hubs.

Over the past four decades, Mumbai has witnessed the disappearance of nearly 80% of its water bodies. Bengaluru, once celebrated for its intricate lake systems, has seen most of them paved over by urban sprawl. Chennai's wetlands have been severely diminished, stripping the city of its natural defences against flooding. As green spaces and permeable land give way to high-rises and concrete roads, rainwater that once gently absorbed into the earth now surges across hardened surfaces—forcing drainage systems to bear the full burden, often with catastrophic consequences.

The Human and Economic Costs

Waterlogging has far-reaching impacts that go well beyond short-term inconvenience. For families, stagnant floodwaters mean an immediate health risk. Mosquitoes breed in the logged water and sewage contamination spreads waterborne diseases. For businesses, repeated flooding translates into property damage, inventory losses, and long hours of downtime. For city governments, every flood demands repair of damaged roads, clearing of silted drains and pumping out water, an endless cycle that drains resources.

Flood-induced traffic snarls have become a stark indicator of the vulnerability of urban life in India. Commuters spend countless hours stranded in waterlogged streets, public transportation systems come to a halt, and emergency responders face immense challenges in reaching affected areas. These cascading disruptions not only paralyse daily lives but also inflict massive economic losses and steadily erode the quality of life in the country's cities.

Rethinking Cities: The Way Forward

Solving India's waterlogging crisis is not just about building bigger drains; it requires a more holistic, forward-looking approach.

First, infrastructure must catch up with the reality of today's climate. Stormwater drainage networks should be upgraded based on present rainfall data, sewer pipes should be enlarged and separated from sewage lines, and modern pumping systems should be installed in vulnerable zones.

Second, waste management has to become a non-negotiable priority. Enforcing waste segregation, desilting drains before the monsoon and expanding wastewater treatment facilities are basic steps that cannot be delayed.

Third, and equally important, is the revival of natural water systems. Protecting wetlands, reviving lakes, and creating green spaces within cities can restore nature's ability to buffer floods. At the same time, adopting green infrastructure such as permeable pavements, rain gardens, and rooftop harvesting can significantly reduce surface runoff.

Finally, governance and community participation will play a decisive role. Strict enforcement of rainwater harvesting laws, deployment of real-time flood monitoring systems, and collaboration between municipal authorities, private companies, and residents are all essential. Corporate social responsibility (CSR) projects can also support city-level resilience, from funding water management projects to training communities in flood preparedness.

Conclusion

Waterlogging in India is not just a drainage problem; it is a mirror reflecting the deeper issues of climate change, environmental neglect, and unplanned urban growth. With extreme rainfall events set to become more frequent, the old ways of managing city floods are no longer enough.

The path ahead demands a holistic understanding that climate, waste, infrastructure, and ecology are deeply interwoven. To strengthen urban resilience against flooding, cities in India must upgrade their drainage networks, overhaul their waste management practices, restore natural ecosystems, and actively involve local communities. While the urgency is undeniable, this moment also presents a powerful chance to reimagine urban planning—crafting cities that protect both their inhabitants and the environment in the face of an evolving climate reality.

- The author is Class XI student of SRDAV Public School, Dayanand Vihar, Delhi

Pic: Dibakar Roy (Pexels)

Why are BDS students still trained with Mercury Amalgam?

Analysing the paradox from scientific, environmental, and pedagogical perspectives

By Archana Prajapati

Dental amalgam processes, including restoration, removal and cremation of deceased individuals with amalgam fillings, result in emissions of mercury. Mounting scientific evidence on mercury's toxicity and the World Health Organization (WHO) and the Minamata Convention on Mercury (2013) explicitly calling for reduction of mercury in healthcare, including dentistry, resulted in a global movement to phase down amalgam use. However, despite growing consensus on the hazards of mercury and the widespread shift towards mercury-free dental practices, Bachelor of Dental Surgery (BDS) students in India are continuing to be trained in dental amalgam filling.

What is Dental Amalgam & Why is it a Risk?

Dental amalgam, an alloy composed of silver, tin, copper, and elemental mercury (50%), is a neurotoxin associated with long-term environmental contamination and risks to human health. As dental practitioners are frequently exposed to mercury vapour during the amalgam filling procedures, the risks to their health is significantly high.

Manipulation of in situ amalgam as is done during polishing, scaling and removal with a drill, results in vaporisation of mercury. This short-term but regular exposure of mercury vapour to dentists and other dental workers may exceed occupational safety limits. Many studies have shown that dental workers on an average have higher systemic levels of mercury in their tissues and organs. The mercury body burden of dental personnel is usually higher than in the general population. Mean urine mercury levels of 3–22 µg/L have been found in dental practitioners contrary to the general population group who have a range of 1–5 µg/L (4-6).

But despite the awareness, in India—where the Dental Council of India (DCI) governs dental curricula—students are still trained extensively with mercury amalgam. This training raises critical questions about occupational safety, environmental responsibility, and clinical relevance in the modern dental landscape.

The Global Shift Away from Mercury

In 2013, the Minamata Convention on Mercury was adopted with the aim to protect human health and the environment from the anthropogenic emissions and releases of mercury and mercury compounds. Part II of the Convention discusses specifically about dental amalgam and requires Parties to phase down the use of dental amalgam through measures tailored to national circumstances. These include setting objectives for caries prevention and reduced amalgam use, and promoting cost-effective mercury-free alternatives. It also emphasises research, education, and training of dental professionals to support the shift. Policy and insurance reforms are encouraged to favour mercury-free materials over amalgam. Additionally, the Convention calls for encapsulated amalgam use only and adoption of best environmental practices in dental facilities to minimise mercury.

In the field of dentistry, practical measures were taken to phase out the use of amalgam because of its high mercury (Hg) content. Scandinavian countries such as Norway and Sweden have implemented near-total bans. Norway was the first country to ban the use of Hg in all products in 2008, including dental amalgam, followed by Sweden and Denmark. On July 1, 2018, the European Union banned the use of dental amalgam for children under 15 and for pregnant/lactating women under the scope of an EU-wide dental amalgam phase-out with the 2017/852 regulation. Many countries have already transitioned to mercury-free dentistry. These shifts reflect not only health concerns but also the environmental burden of mercury disposal, which contributes to global mercury pollution through improper waste management and cremation emissions.

India's Stand

India ratified the Minamata Convention on June 18, 2018, and it came into force on September 16, 2018. Interestingly, the Directorate General of Health Services, Union Ministry of Health and Family Welfare (MoHFW) had issued guidelines to reduce environmental pollution due to mercury instruments and E- waste on March 8, 2010, years ahead of the ratification of the treaty. Following the guidelines, all government hospitals started phasing out mercury based instruments but phasing out of dental amalgam remained a grey area. India, however, has done a tremendous job in phasing down dental amalgam. Indian states and union territories like Chandigarh, Punjab, Rajasthan, West Bengal, Andhra Pradesh, Odisha and Delhi have completely banned use of mercury amalgam, thanks to the efforts of Indian Dental Association (IDA) state branches.

The Training Paradox in Indian Dental Education

Dental colleges across the country are still large users of mercury amalgam as amalgam filling is still a part of the dental curriculum of BDS students. In most dental colleges, especially government institutes, BDS students are still required to master cavity preparation, trituration, condensation, and finishing of amalgam restorations. The justification is twofold: (i) amalgam remains cheaper than resin composites, and (ii) handling amalgam allegedly helps students build fundamental hand skills transferable to other materials. Yet, this justification is increasingly outdated. In clinical practice,

EXPERTS SPEAK

Are You Carrying Mercury in Your Mouth?

By Dr Ritika Jindal and Dr Shreya Singh

If you have silver fillings, that's a serious concern.

Silver fillings, or dental amalgam, are the biggest source of mercury exposure in the human body. Mercury is one of the most toxic substances known to humans, and having it in your teeth means continuous exposure to its harmful effects.

The Hidden Dangers of Silver Fillings

Once it was a proud statement to say, "I have silver in my teeth". Silver was standard material of choice as a filling material for more than 150 years. But here is the truth: silver fillings were never just silver. Those are a mixture of alloy of silver, tin and mercury, one of the most toxic substance known to humans. Dentists were using mercury-laced filling without much concern. But now we know the increasing health and environmental concerns as the silver fillings release small amount of mercury over time. Every time you chew, drink something hot, or grind your teeth, mercury vapours are released from the silver fillings. These vapours don't just stay in your mouth—they are absorbed into your bloodstream, affecting vital organs over time.

Several studies have found prolonged mercury exposure causes:

- Neurological disorders: Mercury affects brain function and may contribute to memory loss, anxiety, tremors, and even Alzheimer's disease.
- Kidney damage: The kidneys filter toxins from the body, but prolonged exposure to mercury can impair their function.
- Immune system suppression: Mercury is known to weaken the immune system, making you more vulnerable to infections.
- Developmental issues: Mercury is particularly dangerous for pregnant women and children, affecting brain development and cognitive function.

The use of mercury has gradually declined across the world, with conventional thermometers and BP instruments also being replaced with digital ones. India is still in the process of phasing them out. Some dentists continue to use these dangerous filling, even though the risks are known. It has thus become important for the public to be aware of what's really going into their mouths. What's even more alarming is that even if you don't have silver fillings, simply visiting a dental clinic that still uses them puts you at risk of mercury exposure due to vapours released into the air and improper disposal of amalgam waste.

Make the Right Choice for Your Health

Modern dentistry provides better, safer, and more aesthetically pleasing alternatives, such as composite and ceramic fillings, which are not only mercury-free but also blend seamlessly with your natural teeth.

The next time a dentist offers you a silver filling just say "No". By being informed and making better choices, we can all protect ourselves, our children and the planet.

Let's say goodbye to silver fillings!

particularly in urban and private settings, patients demand aesthetic restorations that amalgam cannot provide. Resin composites, glass ionomer cements (GICs), and hybrid materials are now the mainstay. Ironically, students often receive limited pre-clinical exposure to these materials, despite their centrality in practice.

Health Concerns for Students

Training with amalgam exposes students in dental colleges to mercury vapours and accidental spills. Students often do the experimentation in inadequately ventilated labs and are exposed to the toxic metal through both contact and non-contact pathways. Contact exposure happens when students or staff directly handle mercury from broken or leaking instruments, leading to contamination of skin and surfaces, although absorption through skin is limited. Chronic low-level exposure is linked to neurotoxicity, nephrotoxicity, and reproductive harm. The greater risk is non-contact exposure through inhalation of mercury vapours, which are invisible and odourless, and can easily accumulate in closed classrooms or laboratories. Once inhaled, mercury vapour rapidly enters the bloodstream and affects the brain, kidneys, and nervous system, causing symptoms such as tremors, memory loss, and concentration problems that may impact students' academic performance. The European Chemical Agency (ECHA) website gives a clear picture of the hazard quotient and health risks of mercury (See QR code below).

Environmental Concerns

Mercury waste from dental colleges is rarely segregated or sent to authorised handlers, leading to uncontrolled environmental release. Once the contact and non-contact amalgam waste has gone through the sewage treatment plant, the remaining amalgam waste becomes sewage sludge and the most commonly non-contact amalgam find its way into it. This sewage sludge is then disposed of in landfills, incinerated, or sold as fertiliser for agriculture purposes. These pathways release mercury into groundwater or air, directly contradicting India's biomedical waste management rules and commitments under the Minamata Convention.

The Case for Mercury-Free Alternatives

Mercury free alternatives have many advantages, which includes:

- Minimal-invasiveness compared to amalgam
- Long lasting than amalgam
- Placed as fast as amalgam
- Unlike amalgam, prevents caries
- Repaired more easily than amalgam
- Safer for environment and health

As most dental colleges look for affordable and cost effective material for practice, they end up purchasing mercury amalgam. However, in the current market scenario, we usually do not see much of a difference in shifting to alternatives. Though the price varies from one brand to another, we found

that while 30 gm mercury amalgam costs between Rs 600-2,057, 15 gm glass ionomer cement costs between Rs 400-1,300.

Following are some alternatives to mercury amalgam:

- Resin Composite: It is most commonly used in clinics, aesthetic, but relatively more expensive and technique-sensitive. Requires strict moisture control.
- Glass Ionomer Cement (GIC): Cheapest among the four, easy to handle, chemically bonds to tooth, fluoride releasing (anticariogenic), and widely available in India. Excellent for training students because of simple placement and minimal equipment needs.
- Resin Ionomer: A hybrid of GIC and composite, better strength and aesthetics than GIC, but more expensive.

However, Glass Ionomer Cement (GIC) is the best option for students. It is affordable, easy to handle, less technique-sensitive, and clinically relevant. It also gives students a foundation before moving on to more advanced materials like resin composites and porcelain.

Conclusion

The persistence of mercury amalgam in BDS training reflects inertia in adapting dental education to scientific progress and global policy. Students strongly believe this practice undermines both clinical preparedness and environmental responsibility. India has the opportunity to lead by example in South Asia by aligning dental education with global best practices. The question is not why we should move beyond mercury amalgam, but why we should continue to delay the inevitable transition?

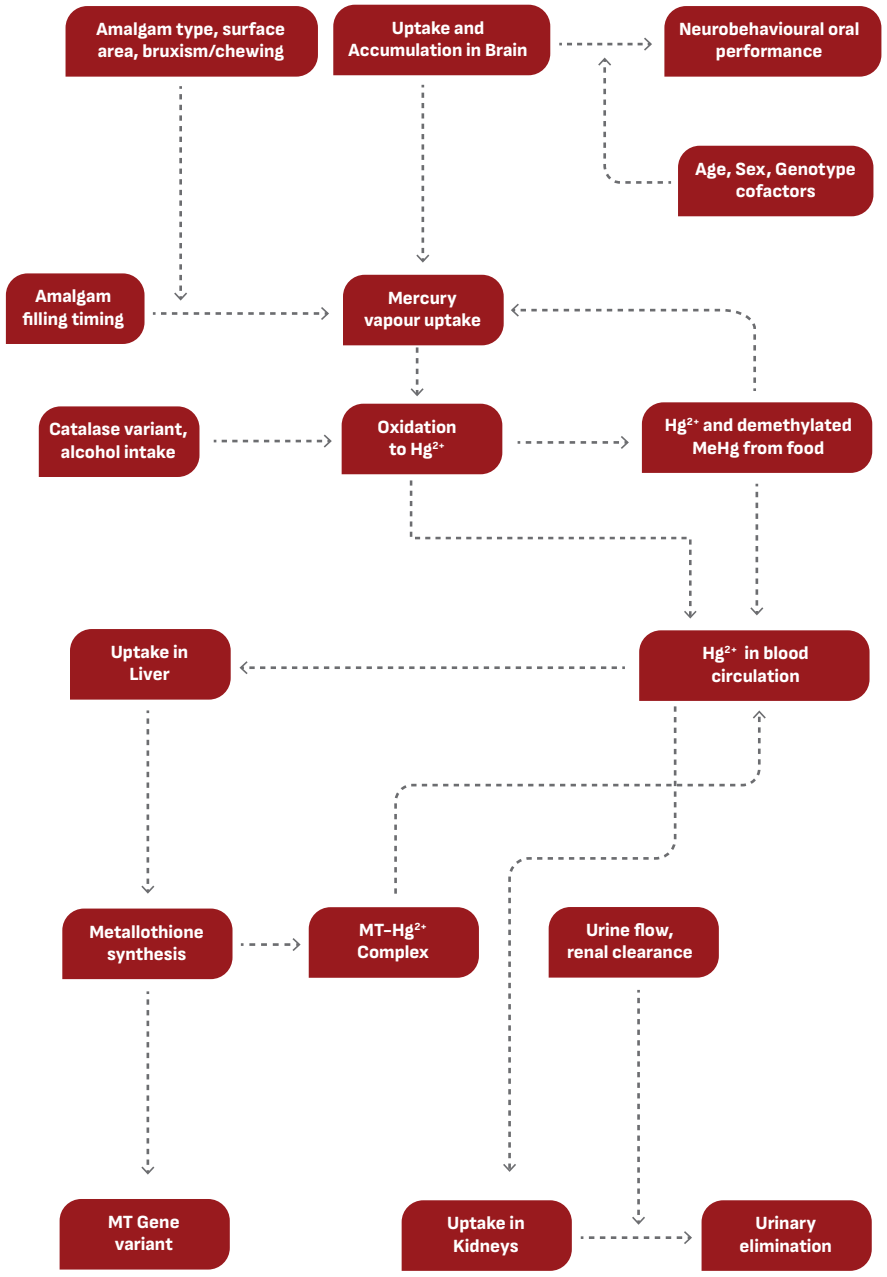
Recommendations

- Curriculum Reform: The DCI should revise the BDS curriculum to emphasise mercury-free restorative techniques, while covering amalgam only theoretically.
- Capacity Building: The faculty should be trained in modern restorative techniques, ensuring students acquire relevant clinical skills.
- Safe Disposal Protocols: For existing amalgam waste, institutions must follow strict protocols under the Biomedical Waste Management Rules (2016).
- Affordable Composite Procurement: Institutions can collaborate with Indian manufacturers for bulk purchases or CSR-supported material donations.

REFERENCES

1. UNEP. Minamata Convention on Mercury. United Nations Environment Programme; 2013.
2. Ferracane JL. Materials in Dentistry: Principles and Applications. 3rd ed. Lippincott Williams & Wilkins; 2011.
3. World Dental Federation. Mercury Hygiene Guidance. Dubai; 2007. [http://www.fdiworldental.org]
4. Morton J, Mason HJ, Ritchie KA, White M. Comparison of hair, nails and urine for biological monitoring of low level inorganic mercury exposure in dental workers. Biomarkers. 2004;9:47–55. doi: 10.1080/13547500410001670312.
5. Molin M, Schütz A, Skerfving S, Sällsten G. Mobilized mercury in subjects with varying exposure to elemental mercury vapour. Int Arch Occup Environ Health. 1991;63(3):187–192. doi: 10.1007/BF00381567.
6. Kasraei S, Mortazavi H, Vahedi M, BakianianVaziri P, Assary MJ. Blood mercury level and its determinants among dental practitioners in Hamadan. Iran J Dent (Tehran) 2010;7(2):55–63
7. UN Environment Programme. UN Environment Minamata Convention on Mercury. 2013. Available online: https://minamataconvention.org/en/amendments
8. Yousefi, H. Replacing dental amalgam by mercury-free restorative materials; it's time to take action. DARU J. Pharm. Sci. 2018
9. WHO. Future Use of Materials for Dental Restoration. WHO Report; 2011. https://www.who.int/publications
10. Clarkson TW, Magos L, Myers GJ. The toxicology of mercury — current exposures and clinical manifestations. *N Engl J Med*. 2003; 349 (18):1731–1737.
11. ECHA chemical database. https://chem.echa.europa.eu/100.028.278/overview?searchText=Mercury
12. Pradhan, S., & Srivastava, A. (2022). Roadmap to mercury-free dentistry era: Are we prepared? Dental Research Journal, 19(1), 77.

Figure 1 Fate of Inorganic mercury and potential effects



Source: Dental Research Journal

PARTICIPATION

No common ground yet, Global Plastic Treaty Talks Far From Conclusion

Chemicals of concern, product design and standalone articles on health were among the most negotiated articles of the Chair's text during INC 5.2

By Alka Dubey

The second part of the fifth session of the Intergovernmental Negotiating Committee (INC-5.2) to develop a legally-binding global plastic pollution treaty resumed in Geneva in August 2025. It was attended by over 2,600 participants, including about 1,400 delegates from 183 countries, 1,000 observers and 70 ministerial representatives of different countries. The session aimed to finalise text for a global instrument addressing plastic pollution across its full life cycle—from design and production to disposal.

Besides member delegates, various non-government organisations (NGOs), research institutions and industries from India attended as observers.

The delegates met in four contact groups to negotiate on the Chair's Text (issued on December 1, 2024) and selected proposals submitted by individual states. Extensive engagements were held in formal, informal and informal-informal format, to find a common ground on key issues. Three procedural articles — Article 30 on Withdrawal, Article 31 on Depository, and Article 32 on Authentic texts — were agreed upon and moved to the Legal Drafting Committee. But controversy on the remaining articles did not end despite heavy debate.

One of the well-negotiated articles was on the scope of the treaty. High-ambition coalitions, led by the European Union, several African nations and Pacific Island states, pushed for a treaty that regulates the entire plastics lifecycle, including upstream measures such as production limits. Contrarily, like-minded countries—including Saudi Arabia, Russia, China, and India—pushed for a treaty focusing on downstream waste management, recycling, and litter control. Financing, a central challenge of the treaty, was also addressed. Developing countries demanded clear commitments on financial and technical support, stressing that without such support, many provisions of the treaty would be difficult to implement. Meanwhile, donor countries sought more flexible arrangements and resisted the obligation.

A further procedural dispute emerged over decision-making rules. Some states supported the introduction of a voting fallback mechanism if consensus could not be reached while others, wary of losing veto power, insisted on consensus-only decision-making—effectively allowing a small group of countries to block progress. Chemicals of concern, product design and standalone articles on health were among the most negotiated articles of the Chair's text during INC 5.2.

A "Chair's Draft" and later "Revised Text Proposal" were released, which were fully bracketed, with some articles so extensively bracketed that several delegations described them as "difficult to decipher." Though human health was addressed in a few articles, such as Articles 1, 4 and 17, a standalone article on health was deleted from the revised proposal. Similarly, articles on sustainable products and emissions got deleted. Despite the marathon negotiations and extensive efforts, the session adjourned without agreement.

Delegates at INC-5.2 echoed the need for further negotiations. They discussed various options, including the possibility of holding a sixth round of talks or forming a coalition of "high-ambition" states that would seek to establish a separate binding agreement. Some delegates suggested returning to the original text from Busan, while others viewed the texts from August 13 and August 15 as improvements. Views are also there to use the existing mechanisms, such as the Basel Convention, to regulate plastic waste trade and hazardous chemical additives.

The Indian delegation made interventions in various articles. They were consistent with the earlier position against legally binding global standards, a separate article on health and consensus-based decision making, while supporting a voluntary, nationally determined approach. India has consistently opposed upstream measures such as production limits and global bans on polymers/chemicals while favouring downstream solutions (waste management, recycling, circular economy), even though domestically, it has launched initiatives like single-use plastic bans. It was reasoned that upstream restrictions could hinder economic development, employment, and industrial growth.

The outcome of INC-5.2 was broadly seen as a setback, highlighting the disparity between the urgency of addressing plastic and the slow pace of global negotiations. Future discussions will be critical in determining whether the world secures a truly transformative plastics treaty—or settles for a weakened agreement that may continue to worsen the crisis.

--The author, Programme Coordinator, Chemicals and Health, Toxics Link was present at INC 5.2 as an observer

REFERENCES:

1. https://www.unep.org/inc-plastic-pollution/media#PressRelease15Aug
2. https://resolutions.unep.org/incres/uploads/chairs_revised_draft_text_proposal_-_15.08.25_at_00.482.pdf

Article 1	Objective	Article 17	Public information, awareness, education and research
Article 2	Principles and Approaches	Article 18	Conference of the party
Article 3	Definitions	**Article 19**	**Subsidiary Bodies**
Article 4	**Plastic Products**	Article 20	Secretariat
Article 5	**Plastic Products Design**	Article 21	Settlement of Disputes
Article 6	Releases and leakages	Article 22	Amendments to the Convention
Article 7	Plastic Waste Management	Article 23	Adoption and amendment of Annexes
Article 8	Existing and legacy plastic pollution	Article 24	Right to vote
Article 9	**Just Transition**	Article 25	Signature
Article 10	**Financial Resources and Mechanism**	Article 26	Ratification, Acceptance, Approval or Accession
Article 11	Capacity Building, Technical Assistance and Technology Transfer, including International Cooperation	Article 27	Entry into force
Article 12	Implementation & Compliance	Article 28	reservations
Article 13	National Plans	Article 29	withdrawal
Article 14	Reporting	Article 30	depository
Article 15	Effectiveness Evaluation	Article 31	Authentic texts
Article 16	Information exchange		

Note: Articles highlighted in red indicate highly negotiated provisions with significant divergences.

First Open-Ended-Working Group on Global Framework on Chemicals

By Vidhi Mathur

Chemical pollution has emerged as one of the pressing global challenges of our time. It is one part of the triple planetary crisis, along with biodiversity loss and climate change, that is threatening human health, degrading ecosystems, causing economic losses and undermining sustainable development.

To address this concern, ministers, heads of delegations, and stakeholder leaders gathered in Bonn, Germany, at the fifth session of the International Conference on Chemicals Management, where they acknowledged the urgent need for sound management of chemicals and waste, and endorsed the creation of a Global Framework on Chemicals (GFC) in 2024. GFC is a voluntary multi-stakeholder agreement that offers a roadmap structured around five strategic objectives and 28 targets. Its goal is to promote the sound management of chemicals and waste throughout their life cycle, ensuring that chemical production, use, and disposal do not compromise human well-being or environmental safety. Therefore, OEWG was set forth by the GFC to take stock of the progress on the tasks set for the IC-1 and exchange of ideas to ensure effective implementation of the framework.

The first Open-Ended Working Group (OEWG-1) of the GFC was held from June 24-27, 2025, in Punta del Este, Uruguay. This historic gathering brought together governments, civil society organisations, and other stakeholders to review progress on the tasks set out for the first International Conference (IC-1) and to exchange ideas on ensuring effective implementation of the framework on chemicals. The four-day-long plenary sessions examined the implementation adopted by the International Conference on Chemicals Management (ICCM) when it adopted the GFC. Among many things, the conference discussed, at length, chemicals under "issues of concern" to spotlight for focused global action, distribution and operation of the GFC fund, resource mobilisation strategies, gap analysis on the current work on GFC's measurability structure with indicators, capitalisation of capacity building, functioning of focal points and plans for launching a global alliance on highly hazardous pesticides. Furthermore, several countries raised questions on the ambiguous mandate of the OEWG and proposed further clarity from the IC-1 about the modalities and the role of the OEWG.

--The author, a Senior Programme Officer with Chemicals and Health Team of Toxics Link, participated in the meeting as an observer

PUBLICATION

Recycled Plastic Toys (Branded): How Safe?

The toy industry is a major consumer of plastics, with a growing shift towards use of recycled materials. While this shift is laudable from the perspective of environmental sustainability, it raises concerns about the safety and quality of toys. For the study "Recycled Plastic Toys (Branded): How Safe?", 10 branded toys made from recycled plastics were tested. The findings reveal that branded recycled plastic toys contain harmful chemicals. These substances, often persistent in the environment and potentially harmful to human health, pose risks, particularly to children who are more vulnerable to chemical exposure. The study underscores the urgent need for better regulation and monitoring of the materials used in recycled plastics, especially in items intended for children.

Read More: https://toxicslink.org/publications/reports/recycled-plastic-toys-branded-how-safe

EVENTS

Toxics Link Advocating for Mercury-Free Dentistry

Meeting in Raipur

Toxics Link, in collaboration with Indian Dental Association (IDA), Chhattisgarh State Branch, organised a meeting in Raipur on July 20, 2025. The event brought together leading dental professionals to discuss the urgent need for transitioning away from mercury-based dental amalgam and embracing safer, sustainable alternatives. The two main sessions during the meeting were: "Minamata Convention & Paradigm Shift in Conservative Dentistry" chaired by Satish Sinha, Associate Director, Toxics Link and "Occupational Health Concerns and Alternatives to Mercury Amalgam" chaired by Dr Neeraj Kumar Chandrakar of Government Dental College, Raipur.

Read Full Report: https://toxicslink.org/publications/workshop-on-mercury-free-dentistry-in-raipur-chhattisgarh

Meeting in Vijayawada

On July 6, 2025, Toxics Link, in collaboration with IDA Andhra Pradesh, held a meeting with dental practitioners in Vijayawada. Satish Sinha, Associate Director, Toxics Link, Dr Madhu Varma, HOD, Dept of Conservative Dentistry, Vishnu Dental College and Dr CH Ram Sunil, Professor, SIBAR Institute of Dental Sciences were the prominent voices during the meeting advocating for the urgent need to phase out mercury from dental practices. There was also a clear call to reform dental curricula to protect future dentists from unnecessary exposure to this toxic metal.

Read Full Report: https://toxicslink.org/publications/workshop-on-mercury-free-dentistry-in-vijayawada-andhra-pradesh

Chemicals in Textlies

Toxics Link brought together industry representatives, regulators and experts to deliberate on the phase-out of Nonylphenol (NP) and its ethoxylates (NPEs) from textiles. Participants at the meeting held on July 24, 2025 in Surat, reviewed the serious health and environmental risks of NP/NPEs, acknowledged the availability of safer alternatives, and discussed obstacles such as higher costs, lack of national standards, and persistent contamination. They agreed on the need for a roadmap involving usage mapping, cost assessment of alternatives, capacity building, supplier accountability, and formulation of policy frameworks. The meeting closed with a shared commitment to voluntarily adopt NP/NPE-free practices, supported by regulation, research and collaboration.

Read Full Report: https://toxicslink.org/publications/follow-up-roundtable-on-chemicals-in-the-textile-sector

Lead Poisoning in India: Where We Stand

Policymakers, experts, medical professionals, and civil society representatives gathered at the India Habitat Centre, New Delhi on June 18, 2025 to discuss the challenges of lead exposure from various sources including paints and its impact on vulnerable populations like children. The occasion was a stakeholder meeting on "Lead Poisoning in India: Where we Stand" organised by Toxics Link.

Read full report: https://toxicslink.org/publications/conference-on-lead-poisoning-in-india

Combating AMR in Goa

Toxics Link, in collaboration with the Goa State Pollution Control Board, hosted a day-long stakeholder meeting at the International Centre, Goa on September 12, 2025, to deliberate on the "Challenges and Solutions to Antimicrobial Resistance (AMR) in Goa". Representatives from Goa State Pollution Control Board, Department of Health Services, Department of Animal Husbandry and Veterinary Services, Americares India Foundation, academia, and the pharmaceutical industry joined the discussion. The stakeholders emphasised on the importance of comprehensive research on antibiotic pollution, the development of advanced technologies for effluent treatment, and enhanced cross-sectoral coordination.

Read Full Report: https://toxicslink.org/publications/stakeholder-meeting-on-challenges-and-solutions-of-antimicrobial-resistance-amr-in-goa

Toxics Link partners for ATOM Film Festival 2025, Tamil Nadu

Toxics Link joined hands with NilgirisNext Foundation for Art & Culture (NXF) for the ATOM Film Festival: Ecology, Culture, and Society in 2025, organised at the Rathinam College of Arts and Science, Coimbatore on July 30-31. The festival was inaugurated by Minister for Tamil Development, Information and Publicity Thiru M.P. Saminathan. The festival was more than a celebration of films—it became a space for reflection, conversation, and action. Environmentalists, students, filmmakers, and educators, engaged on themes of ecology, culture and society.

Toxics Link at Van Mahotasav

Toxics Link participated in Van Mahotsav 2025 celebrations organised by Department of Forests & Wildlife, Government of NCT of Delhi, at Bharat Mandapam on July 3 and 4, 2025. The event saw many visitors, including government bodies, NGOs, manufacturers, recyclers, academic institutions, and the general public visiting our stall. Sensitising the visitors about environment protection and sustainability, Toxics Link created a stir. Repair, Reuse and Reduce strategies were promoted, which caught the eye of many school and college students keen to learn sustainable practices, faculty members, environmental clubs, recyclers and manufacturers exploring circular economy models.

About Toxics Dispatch

Toxics Dispatch was started in 1998 with the primary objective of creating awareness about environmental pollution related to the management of waste and hazardous chemicals and their impact on the environment and public health.

Toxics Dispatch was born out of the need to reach out to various stakeholders, including government officials, judiciary, youth, and the general public, to sensitise them about the extent of toxic pollutants and their damaging effects on the environment.

Since its inception, Toxics Dispatch has highlighted pressing issues of hazardous, biomedical, municipal solid waste, e-waste, international waste trade, and the emerging issues of pesticides and Persistent Organic Pollutants (POPs). The newsletter aims to disseminate information to help strengthen the campaigns against toxic pollution, provide cleaner alternatives, and bring together groups and people affected by this menace.

Toxics Dispatch comes out thrice a year and is available online and in print. You can subscribe by writing to us at info@toxicslink.org.

All issues of Toxics Dispatch can be viewed at

https://toxicslink.org/dispatch

CLICK HERE

Toxics Link
for a toxics-free world

CELEBRATING 25 YEARS 1998-2023

Stay Connected

For more information, invitations and updates on environmental issues please write to us at info@toxicslink.org

/toxicslink
/toxicslink
toxics_link
Toxics Link (The Just Environment Charitable Trust)

Toxics Link
H-2, Jangpura Extension, Delhi
Delhi-110014
Tel: 91-11-49931863, 49981921
E: info@toxicslink.org,
comm@toxicslink.org

www.toxicslink.org