

# T O X I C S DISPATCH



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Toxics Link  
for a toxics-free world

## CHEMICAL MANAGEMENT: THROUGH THE LENS OF SUSTAINABLE DEVELOPMENT GOALS

### INTRODUCTION

In today's time, chemicals are significant to the manufacturing of many products and this has been a major contributor to the GDP. It provides livelihood to many across the globe in all the sectors includes transportation, health, agriculture, construction, textile etc. The estimated size of the global chemicals market was USD 3.9 trillion in 2013 and it was expected to grow at 3-4% per annum to reach USD 4.7 trillion by 2018. India accounts for approximately 3% of the world chemical markets and the chemical industry contributed approximately 6% to the nation's GDP in 2013 (FICCI, 2014).

There is also a clear link that has been established between poverty and increased risks of exposure to hazardous chemicals and waste in the country: it is predominantly the poor who routinely face unacceptably high risks because of their occupation, living situation and lack of knowledge about the detrimental impacts

of exposure to dangerous chemicals and waste. The significant cost associated with chemical management is extensive and chemicals can have significant negative effects on human health and environment which has a considerable amount of cost to society and management of chemicals is important component to achieve sustainable, inclusive and resilient human development. As per the WHO 2011 report 4.9 million deaths (which is 8.9% of the total global deaths) were caused due to environmental exposure and poor management of selected chemicals in the world. In the year 2008 the global environmental cost due to chemicals was 236.3 billion due to volatile organic compounds (VOCs), which comes from a variety of sectors and sources, including transport, coal combustion and USD 22 billion due to mercury emissions. The below table throws light on the relationship between the chemicals and deaths caused due to its use.

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## SUSTAINABLE DEVELOPMENT GOALS

## EDITORIAL

The sustainable development goals are universal goals and call for action to end poverty and ensure better quality of life for all. These 17 goals are subsequent to the Millennium Development Goals in 2016 and provide a well defined roadmap for nations to move forward towards sustainable development. The use of chemicals and sustainable production consumption has been attempted to be addressed through the SDG since chemicals pose serious challenge to human health and ecology. This is especially pronounced in developing economies where data and information about chemicals are scarce, practices compromised and monitoring mechanisms inadequate. While there is a growing awareness on downside impacts of chemicals management, the efforts by all stakeholders haven't kept pace and pose serious risk to human health.

India is signatory to all Multilateral Environmental agreements (Minamata in process) that are essentially aimed towards safer chemicals management and in turn achieving sustainable development goals. However safer chemicals management over its complete lifecycle is still a major challenge in the country. The issues around chemicals management in the context of sustainable development goals are not clearly understood by relevant stakeholders, hence action to address the concerns are also highly inadequate. The Sustainable Development Goals enunciated under its goal 3, 6, 11 and 12 have prioritised chemical management and urged governments to initiate action. Hence it is critically important that the central government evaluates the progress against the stated goals and make necessary amendments in programs and policies if required.

Chemicals and waste are interlinked since most upstream usage are finally consigned into the waste stream and disposed through various means that have significant direct impact on water, air quality and resultant public health issues. Prevention and generation of hazardous wastes and the rehabilitation of contaminated sites are the key elements, and both require knowledge, facilities, financial resources and technical and scientific capacities. While the government has made significant efforts to deal with issues of waste and sanitation, a lot more is still to be done and achieved.

Important that industry, government and civil society work closely towards achieving the Sustainable Development Goals by 2030 so that it helps to improve quality of life of all segments of society at both urban and rural spaces.

Satish Sinha  
Associate Director, Toxics Link

**Table 1: Deaths and DALYs due to Chemicals and Chemicals Categories**

Chemicals in unintentional acute poisonings	346,000	7,447,000
(unintentional ingestion, inhalation or contact with chemicals)		
Asbestos	107,000	1,523,0
Occupational lung carcinogens (lung cancer caused by exposures to 00 arsenic, asbestos, beryllium, cadmium, chromium, diesel exhaust, nickel and silica)	63,000	261,000
Occupational leukaemogens (benzene, ethylene oxide and ionizing radiation)	113,00	7,400
Occupational particulates (COPD)	3,804,0	375,000
Occupational particulates (silica, asbestos, coal mine dust)	29,000	1,0061,0
Out door air pollutant (urban air pollution, largely from combustion sources)	8,747,000	1,152,00
Lead (lead-induced cardiovascular diseases in adults)	143,000	1,789,0
Lead (mild mental retardation due to lead-associated IQ deficits (childhood exposure)	Not given/ applicable	7,189,000

Source: (Prüss-Ustün et. al., 2011)

Hence, the cost of not taking action towards the sound management of chemicals is often higher than the costs of implementing measures to manage chemicals in ways that minimize adverse effects to human health and to environment. A large part of resources, which otherwise could be used for development have to be allocated to disaster management and reconstruction work caused due to chemical hazards. It is therefore very important to address this issue to achieve sustainable development goals by ensuring sound chemical management.

### ROLE OF SAICM IN CHEMICAL MANAGEMENT

It was during the 2002 World Summit on Sustainable Development Goals in Johannesburg called for development of Strategic Approach to International Chemical Management (SAICM), which will address significant health and environmental harms caused due to chemical exposure and makes it a global political commitment to reform how chemicals are being produced and used in order to minimize its impacts on health and environment. Hence, Strategic Approach to International Chemical Management was adopted in 2006 with a broader objective to achieve **sound management of chemicals throughout their life cycle so that by the year 2020 Sustainable Development Goals can be attained by minimizing the significant adverse impacts of chemicals on the environment and human health.** In adopting SAICM, governments agreed that advancing chemical safety should be viewed as necessary components of the Sustainable Development agenda. The disease and behavior disorder caused

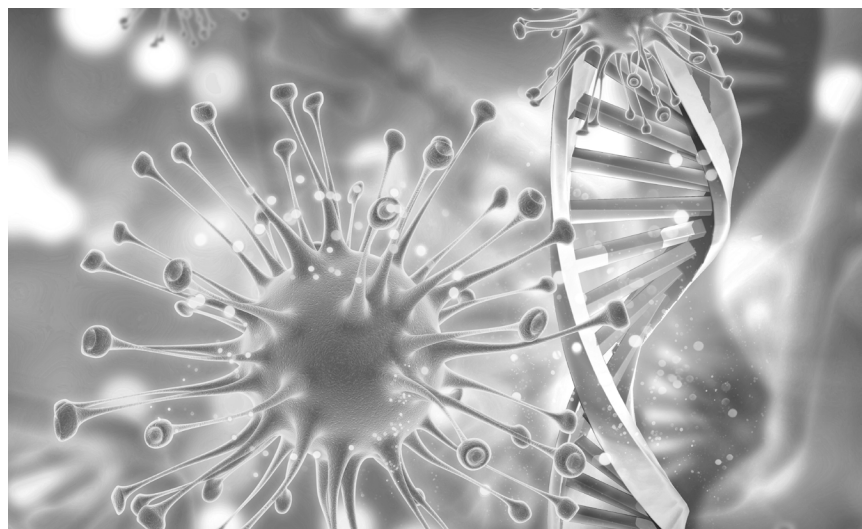
by chemical exposure is not only causing human suffering, they also retard economic productivity and impose costly additional burdens on a country health and education systems. Shortfalls in a country's ability to manage chemicals become barriers that block economic development and poverty reduction initiative.<sup>1</sup>

## CHEMICALS SAFETY AND SUSTAINABLE DEVELOPMENT GOALS

Sustainable Development Goals (SDGs) came into effect in January 2016 with a universal call of action to end poverty, protect the environment etc. There are 17 goals set in Sustainable Development Goals with 169 targets demonstrate the scale and ambition of this new universal agenda towards reducing the health risk posed due to chemicals and others aspects. In order to understand the relationship between SDGs and SAICM it is important to refer to the first statement raised during the International Conference on Chemicals Management (ICCM1), held in Dubai, February 2006 which clearly states that "Sound management of chemical is a prerequisite to achieve the Sustainable Development Goals, including eradication of disease also for the improvement of human health and environment in order to elevate and maintain standard of living in countries at all levels of development"<sup>2</sup>. It is paramount that management of chemicals needs to be integrated and indivisible to strike a balance in the three dimensions of sustainable development: the economic, social and environmental. Chemicals and wastes are reflected in a number of goals and targets, including health, water, cities and human settlements, sustainable consumption and production to reduce the risk posed by the chemicals that are currently being manufactured and used. Sustainable Development Goals ensures to achieve chemical safety through sets of goals which discuss about the chemicals management in the country. They are as follows:

<sup>1</sup> Beyond 2020 perspectives by International POPs Elimination Network

<sup>2</sup> UNEP - WHO (2006) Dubai Declaration, Strategic Approach to International Chemicals Management [http://www.saicm.org/index.php?option=com\\_content&view=article&id=73&Itemid=475](http://www.saicm.org/index.php?option=com_content&view=article&id=73&Itemid=475)



### Goal 3 which ensure "Ensure healthy lives and promote well-being for all at all ages"



- 3.9 sub theme of Goals 3 which manifest that by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination.

### Goal 6 which "Ensure availability and sustainable management of water and sanitation for all".



- Sub theme 6.3 manifest that by 2030 to improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and increasing recycling and safe reuse by x% globally.

### Goal 11 which discuss about "making the cities and human settlements inclusive, safe, resilient and sustainable"



- Sub objective 11.6 discuss that by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, municipal and other waste management.

### Goal 12 of SDGs "Ensure sustainable consumption and production patterns"



- 12.4 goal of SDGs ensure that by 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frameworks and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment.
- 12.5 goals postulate that by 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse.

Chemical contamination globally has caused grave damage to human health, genetic structures and reproductive outcomes and to environment. It has been continuing within some of the world's most important industrial areas and restoration of these areas will require major investment as well as development of new techniques. A substantial use of these chemicals is essential to meet the social and economic goals of the world community and this can be used with a high degree of safety when best practices are followed.

## SAICM BEYOND 2020

To effectively implement the comprehensive and integrated nature of the Sustainable Development Goals as they are related to chemical management, global community or the countries have to go beyond minimizing the use to these hazardous chemicals in order to reduce the adverse effects of toxic chemicals to human health and ecosystem. There is need

of a circular and Life Cycle Approach<sup>3</sup> for Sustainable Consumption and production of chemicals coupled with mandatory protocol for chemical management is in place. A framework needs to be developed in each country to address related environment and health issues, coupled with measures to advance a green economy and sustainable chemistry at all levels is needed to support the effective implementation of the SDGs. Management of chemicals requires prevention, reduction, remediation, minimization and elimination of risk during the life cycle of chemicals. This would largely require strengthening the governance,

production practices and use of improved practices and technologies at each stage of the life cycle to reduce the threats emerging out of the hazards.

There are number of conventions and treaties like Stockholm Convention on Persistent Organic Pollutants, Basel Convention, Minamata convention and Basel convention have been adopted to look into the various aspects of chemical issue to minimize the adverse impact of chemicals on human health and environment however SAICM is only global forum where full range of known and newly discovered health and environmental concerns associated with the chemical life – cycle can be identified, assessed and addressed. Further it provides opportunities for information exchange, knowledge sharing, support and

encouragement to government officials. After adoption of SAICM in 2006, it has come long way in mainstreaming the issues of lead in paints, chemicals in products and endocrine disrupting chemicals, highly hazardous pesticides, however problem of chemicals and waste is getting worse day by day with the changing socio economic dynamics of the world and is largely impacting day to day life all sections of the society. Hence SAICM will be continued to be useful for the countries and there is enough need and scope to expand SAICM beyond 2020.

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3 A life cycle approach can help us make choices. It implies that everyone in the whole chain of a product's life cycle, from cradle to grave, has a responsibility and a role to play, taking into account all the relevant impacts on the economy, the environment and the society.

## REFERENCE:

- FICCI, (2014). Handbook on Indian Chemicals and Petrochemicals Sector. Retrieved from <http://ficci.in/spdocument/20441/Knowledge-Paper-chem.pdf>
- Prüss-Ustün A, Vickers C, Haeffliger P, and Bertollini R. (2011). "Knowns and Unknowns on burden of disease due to chemicals: a systematic review". Environmental Health, 2011, 10(9). Retrieved from <https://ehjournal.biomedcentral.com/articles/10.1186/1476-069X-10-9>.
- The total deaths and DALYs for each category as presented in the text of Prüss-Ustün et al (2011) and in most of this table cannot simply be added up as there would be double-counting, for example, for lung cancer from occupational asbestos exposure. See footnote 16.
- "Chemicals responsible for unintentional poisonings may include methanol, diethylene glycol, kerosene, pesticides, and many others (Prüss-Ustün et al 2011)".
- Agents linked to "poisonings" in the WHO "Global Burden of Disease analysis", also include medications and narcotics. Available at: [http://www.who.int/healthinfo/global\\_burden\\_disease/en/index.html](http://www.who.int/healthinfo/global_burden_disease/en/index.html). and [www.who.int/entity/healthinfo/statistics/gbdestimatescauselist.pdf](http://www.who.int/entity/healthinfo/statistics/gbdestimatescauselist.pdf); See also, the WHO International Classification of Diseases, the standard diagnostic tool for epidemiology, health management and clinical purposes. Available at: <http://www.who.int/classifications/icd/en/html>. Therefore, the deaths and DALYs in this category that might be addressed by the sound management of chemicals, are lower than what is presented here; they are accounted for in the number of deaths and DALYs due to chemicals in the Costs of Inaction study scope.
- By 2002 in the US, compensation claims for asbestos-related injuries cost businesses and insurance companies more than USD 70 billion (RAND 2005). Future claims could cost businesses as much as USD 210 billion or more, according to the Rand Corporation. Available at: [http://www.truthaboutlloyds.com/news/news\\_rand\\_092502.html](http://www.truthaboutlloyds.com/news/news_rand_092502.html).
- Among the global burden of disease attributable to asbestos, 41,000 deaths and 370,000 DALYs were due to asbestos-caused lung cancer, and 7,000 deaths and 380,000 DALYs to asbestosis. Deaths and DALYs from lung cancer and asbestosis are included in the estimates for occupational lung carcinogens and occupational particulates but are not counted more than once (Prüss-Ustün et al., 2011).
- Outdoor air pollution includes secondary pollutants such as ozone (O<sub>3</sub>), and carcinogens such as benzo[a]pyrene, benzene, and 1,3-butadiene (Ibid).
- Only urban air pollution in cities with more than 100,000 inhabitants is taken into account. Health impact from rural air pollution is unknown (Ibid).
- Respiratory infections in children contributed 121,000 deaths and 1,555,000 DALYs to this burden (Ibid).
- Exposure was measured using particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) as an index for common mixtures of urban air pollution (Ibid).



## URBAN WASTE MANAGEMENT IN INDIA - CURRENT SCENARIO AND FEASIBLE SOLUTIONS

Municipal solid waste generated from households is becoming a menace in cities. Owing to severe space constraints, the existing landfills are grossly over utilized which poses a huge risk to the people around and the environment. Few months ago, an incident which happened in the capital city of New Delhi shocked the whole country. The Ghazipur landfill (a municipal landfill site) collapsed, claiming the lives of two and leaving seven injured. Every day, on an average, this landfill site receives 3000 tons of waste from East Delhi Municipal Corporation and the height of the landfill has reached over 50 metres. According to experts, the permissible height of the garbage dump/landfill is 20 meters. Apart from these, there is a high risk of emission of landfill gases like dioxins, furans, polychlorinated biphenyls (PCB) and greenhouse gases like methane, carbon dioxide etc. This happens due to incomplete combustion of plastic waste and anaerobic decomposition of biodegradable waste. Consequentially, the health of marginal communities in the nearby locales as well as the surrounding air quality in general is severely affected.

The climate of the location may worsen the situation even more, both for the nearby areas and distant locations. In summers, for example, the smoke created due to the landfill spreads to other areas easily due to the wind and high temperatures. But, during winters, this smoke on coming in contact with mist or fog in the absence of high speed winds gets converted to smog. Consequently, New Delhi faced a serious environmental crisis due to smog in the winter of 2017. Panic spread across the capital and the day-to-day activities of the common citizens were hampered. Masks and scarves covering the nose, mouth and even the faces of the general public became a common sight. Senior citizens were asked to stay indoors and schools were shut down for weeks. People already suffering from

asthma, bronchitis and other respiratory ailments had an even more difficult time. But, it is worth mentioning that factors like stubble burning in nearby states, vehicular and industrial pollution were also some of the major contributors to the disastrous situation.

Experts recommend various ways to overcome the existing problems of waste disposal and management. A decentralized domestic waste management system at the community level can be a good measure to ensure on-site segregation. The government is doing its best to promote household segregation of dry and wet waste. Dry waste includes non-biodegradable waste such as plastic, paper, bottles and tetra pack most of which are recyclable. Wet waste is the biodegradable waste including vegetable and fruit peels, wasted food, fish and meat waste which can be composted or used for biogas production for cooking purposes.

After source segregation, the different types of waste can be channelized to various collectors, dismantlers and/or recyclers. Further, the non-recyclable and non-reusable waste may be sent to landfills. Hence, even it is not possible to prevent waste from ending up at landfill sites altogether. But, it is possible to remarkably reduce the quantity of such waste and thus, prevent overloading of landfills. The unnecessary cost of transportation and labor may also be cut down this way. However, these solutions need investments, trained personnel and community effort for successful implementation. For instance, for setting up a decentralized waste management facility and its maintenance, a municipal body would need cooperation from the local community as part of a larger plan for the plant to sustain. There have been instances like in Thiruvananthapuram, where community installed systems have faced failures due to lack of trained

personnel responsible for handling and improper maintenance.<sup>1</sup>

A great example of a decentralized plant is an anaerobic digestion unit which is a sustainable solution implementable at the household or community level for the production of biogas. In fact, this concept is getting quite popular in cities like Bangalore, Chennai and Coimbatore as well as many other smaller towns.<sup>2</sup> The household biogas unit is portable and can be easily installed in the back yard or even on the terrace. It only occupies an area equivalent to a water tank and can generate biogas for three to four hours per day depending upon the amount of wet waste added. The biogas produced can be used for cooking and the bio-sludge obtained after digestion can be used as manure for plants. Some of the salient features of the household biogas plant include

- Generation of biogas equivalent to 0.5 kg of LPG/ day with 1kg of kitchen waste from a 1 cubic meter biogas unit.
- Portable biogas unit of 1 cubic meter can replace the use of 10 LPG gas cylinders per year.
- No recurring cost for portable household biogas unit, whereas it is not the case with community level biogas unit.
- Cost of the portable biogas plant is approximately Rs20000 – Rs23000 and the payback period is only 24-36 months.
- Design of this type of portable biogas unit does not produce offensive smell,

1 <https://timesofindia.indiatimes.com/city/thiruvananthapuram/most-community-biogas-plants-in-city-dysfunctional/article-show/59149972.cms> (Date of reference: 08/02/2018)

2 <https://timesofindia.indiatimes.com/city/chennai/on-a-cool-jaunt-inside-an-eco-friendly-house/articleshow/60145034.cms> (Date of reference: 08/02/2018)

during anaerobic digestion as well as cooking.

- KVIC (Khadi and Village Industries Commission) portable model biogas units are approved by MNRE (Ministry of New and Renewable Energy) under which subsidy can be availed for installation in the household.<sup>3</sup>

Resultantly, carbon foot print due

<sup>3</sup> [http://mnre.gov.in/file-manager/UserFiles/physical\\_targets\\_for-NBMMP-2017-18.pdf](http://mnre.gov.in/file-manager/UserFiles/physical_targets_for-NBMMP-2017-18.pdf) (Date of reference: 09/02/2018).

to the greenhouse gas emission from the municipal waste landfill would be greatly reduced as 70 percent of the gas produced from landfills comprises methane which is a well-known greenhouse gas. Methane has 20 times more global warming potential compared to carbon-dioxide. Besides, the leachate produced in the landfills contains high levels of toxic metals, ammonia, toxic organic compounds and pathogens. This can percolate and locally contaminate the groundwater and also irreversibly impact the soil quality of the areas surrounding a landfill site.

Urbanization has become a major concern not just for urban planners but for common people as well. And in the near future, Indian cities would be facing environmental crisis as well as increasing demand for resources. This makes it vital for choosing more feasible and sustainable alternatives to dumping irresponsibly at landfill sites.

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## WATER: A MULTIDIMENSIONAL CHALLENGE FOR SUSTAINABILITY

Couple of decades back in 1995, Ismail Serageldin – the then Vice President of the World Bank – warned the world, ‘If the wars of this century were fought over oil, the wars of the next century will be fought over water.’ While we live in the reality of his warnings coming true where the states and the countries sign agreements and fight political battles over water, the story unfolds further with UNESCO (2012) predicting water stress for two-thirds of the world population by 2025. Not even a decade, just 7 years from now and India is projected to fast approach physical water scarcity. Water scarcity is no more a word for future or foreign. It perhaps is the biggest threat that the humankind is facing and that too largely for being insensible to the limited availability of this natural resource.

Water, the lifeline of earth, is used in every single human activity. With its historic significance to the emergence of biggest civilizations, like, Mesopotamia, Indus or Hwang Ho, water courses continue to be the concentrating centers for urban civilizations in the modern world which is also evident in the satellite imageries of earth. This essentiality also makes the resource vulnerable to over usage, particularly when the consumption goes higher with rising population, urbanization and industrialization.

India being a fast developing country is expanding economically and infrastructurally- demanding heavily of its natural resources including water. Despite having huge river resources and good average rainfall the country is drought

stricken for three consecutive years (2015, 2016 & 2017) and physically and economically water stressed (FAO & UNESCO). One of the reasons being water resources in India are not equally distributed, be it the rivers or the rainfall. Average annual rainfall in the country varies from a low of 400 mm to as high as 3000 mm and sometimes such variance is within the same state. This has also impacted the practices in different regions widely. In spite of the water woes, somehow conservation remained an untouched zone for years and we were never taught of valuing water as something to keep pure, to use wise. Though water has always been dearly worshipped in the traditional cultures of every region in the country, yet it never is valued as a resource to conserve.

But it is high time that we recognize that there is no alternative to sustained use and conservation of water, as:

- Water is a finite resource and exists in a cycle. There cannot ever be more water than what is now- no matter how many folds our consumption goes up. Both the quantity and quality of freshwater is degrading rapidly .
- The global water deficit could be as high as 40% by 2030 under a business-as-usual scenario (Water Resource Group).
- Amount of the easily accessible freshwater for human use is

### Water Stress



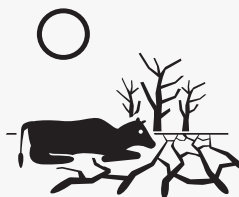
Annual water supplies  
< 1,700 m<sup>3</sup> per person

### Water Scarcity

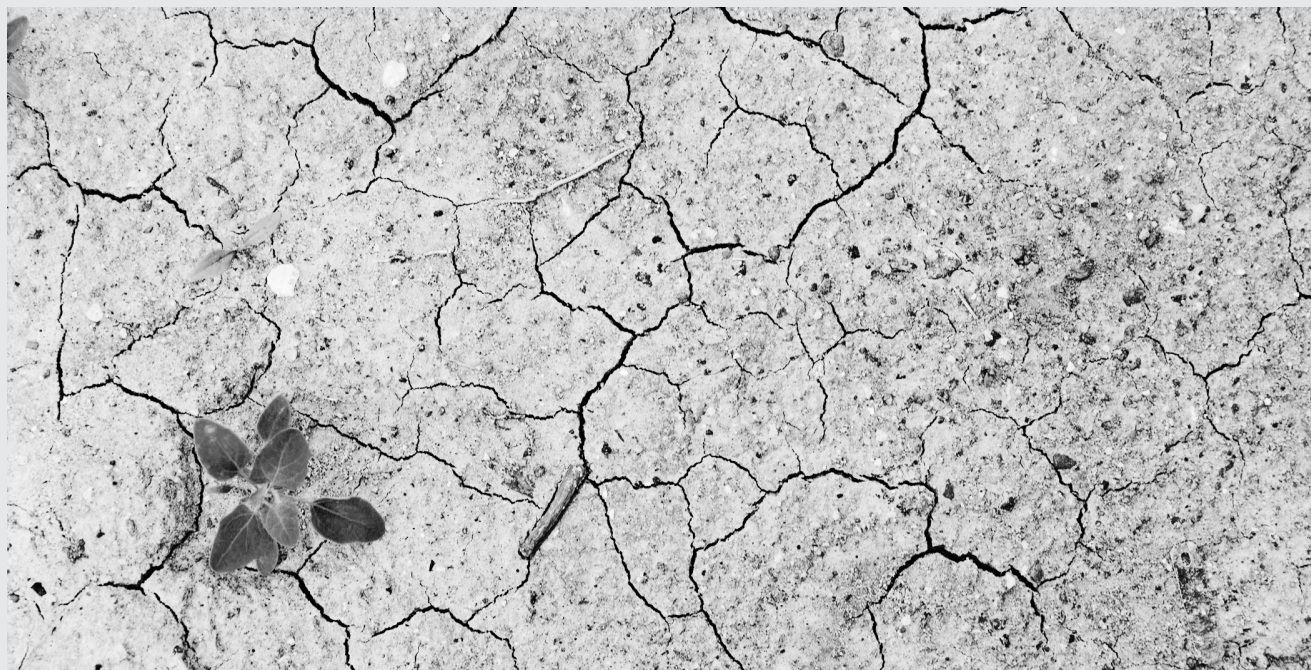


Annual water supplies  
<1,000 m<sup>3</sup> per person

### Absolute Scarcity



Annual water supplies  
<500 m<sup>3</sup> per person



extraordinarily less, just 0.0075 percent! Out of the total water on earth 97.5 percent is saltwater. Of the remaining 2.5 percent freshwater 68.7 percent is in the glaciers and ice caps and 31 percent is groundwater which is largely inaccessible to us. The rest 0.3 percent of the entire freshwater can only be easily accessed by humans and most other non-marine living things on the planet for all their needs.

- Agriculture – the food producing sector – alone consumes 70 percent of the world's fresh water (FAO). It takes thousands of litres of water to produce 1 kg of rice. If that water was to be priced, even at 1 rupee per litre, rice would never reach the plates of a common man!
- Over usage is reportedly drying some of the world's most important rivers. Rivers across the globe, from England to China, North America to Australia, are no longer carrying the volume of water they used to. The Colorado River– flowing over 1500 miles for six million years forming the spectacular Grand Canyon – is now drought stricken. Our very own Indus and Teesta are in that grim picture too.

- All major rivers in India, Ganga, Yamuna, Brahmaputra, Godavari, Chambal, Cauvery, Krishna, Damodar, Mahanadi are severely polluted. It takes the governments to spend hundreds of crores of rupees to clean them for a quality water supply to the population.

Sustainability, therefore, can never be a choice but the only way at individual, collective or institutional levels to tackle water scarcity – a crisis to stay for centuries of human existence.

Following are some simple changes in individual practices and choices that can turn the table towards sustainability:

- **Count on your waste and reduce them.** Almost 95 percent of your water consumption is 'embedded water' which is used to produce, process, transport, store and dispose the things you use. Zero the food waste, use products till the end of its life, refuse to take additional amounts even if they come for free (e.g., tissue paper), etc.
- **Choose wisely.** Go for less water intensive products for your daily life, like a pair of cotton trousers over jeans, homemade products over highly

processed food items, or a cup of tea over coffee. One cup of black tea (250 ml) has 30 litres of embedded water whereas a cup of black coffee takes 140 litres. Embedded water for making jeans materials is at least 10 times higher than any cotton. You can always Google for a longer list of water saving choices. Consumer demand certainly drives the market. Thus, every little choice you make can bring about a sea change.

- **Change the practice.** Have a bath rather than a shower, take a mug rather than running the water off the tap, use a dual flush in your toilet instead of the universal one, sprinkle your garden rather than hosing, fix the leaks, wash your vehicles less frequently, etc.
- **Conserve.** You can recycle the waste water in your toilet, collect and store the runoff from your rooftop to harvest rainwater, reuse the water used to wash vegetables for gardening or other purposes. Installing water meters and checking them periodically will help in checking your domestic water consumption.

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### INTERVIEW WITH DAN MORRISON

*Dan Morrison is a part of a research by Orb Media which confirms the presence of microplastics in bottled water. Orb Media is a Washington DC based nonprofit news organization. He has written on science, conflict and culture for publications including The New York Times and National Geographic. He has also authored a book titled "The Black Nile".*

#### **What prompted you to do such story?**

While doing research on plastic pollution, my colleagues at Orb Media noticed, nearly two years ago, that most of the research available on microplastics pollution – a large and growing body of work – involved the marine environment. We couldn't find studies that dealt with microplastic and drinking water - nothing. The absence of existing research, in 2016-17, led us to initiate a study to determine the presence of microplastics in tap water from all over the world. We collected samples from more than a dozen countries on five continents, that were tested at the University of Minnesota. The study found that more than 83 per cent of the tap water samples contained microplastic fibres. This led to another question: if microplastic is in tap water, is it also in bottled water? In that study, which was released in March,, we found that 93 per cent of 259 bottles from five continents contained microplastic contamination.

#### **What were the challenges did you face while doing this study?**

There were different sorts of challenges. The study was designed by Prof. Sherri Mason, Chair of the Department of Geology and Environmental Science at the State University of New York in Fredonia. Mason also designed the tap water study, and supervised the lab work. The primary challenges were to collect samples from diverse locations around the world and get them unmolested to the laboratory, and to document the process to show that the bottles weren't tampered within transit from places like Indonesia and Mumbai.

Certainly, there was a challenge in addressing a key question – does consuming microplastic cause any harm to humans? The current research, which experts say is fragmentary and incomplete, does not show any harmful health effects.

#### **What was the global response of the study?**

In response to our reporting, the World Health Organization has now launched



**Dan Morrison**

an initiative to promote research into the health effects of plastic particles in food and beverages. Since publication of our story in leading news outlets around the world, McGill University in Toronto has carried out its own study, which found microplastic contamination in several brands of Canadian bottled water.

#### **Did you find any difference in the reaction between the developing and developed countries?**

The main differences were in reaction to the tap water study versus the bottled water study. The tap water study led to action by governments and academia, because the delivery of safe drinking water is a primary responsibility of government. That's led authorities to test tap water and wastewater in cities and towns in Asia, Europe and the Americas. Bottled water is commercial product, and there are no regulations in any country I found that specifically limit microplastic particles in food and beverages. So no one is breaking any rule by having microplastic in bottled water. And, at this time again, there is no definable harm.

#### **How have you planned to take this study further?**

In addition to Orb Media's reporting on other topics including global demographic trends, governance, and climate, we are exploring future plastics-related projects.





## IDENTIFY AND ADDRESS SOURCES OF POLLUTION IN YAMUNA: NGT

Source: *Indian Express*, New Delhi, Feb 26, 2018

The National Green Tribunal has directed the Delhi and Haryana governments to identify and address the sources of pollution in river Yamuna. A bench headed by Justice Jawad Rahim ordered Central Pollution Control Board (CPCB) and Delhi Pollution Control Committee (DPCC) to ensure that action is taken against the erring industries responsible for causing pollution. "Though, the issue is with regard to high level of ammonia in the water which is reaching the water reservoir of Delhi Jal Board, if you take the entire river eco-system, the pollution level in the portion of the river passing Delhi also needs to be properly checked."

"In the circumstances, we direct both, the State of Haryana and NCT of Delhi to ensure that they identify the source of pollution and address it appropriately. CPCB and DJB shall be involved to ensure the erring industry or local bodies and other parties who are causing pollution are dealt with appropriately and check the pollution level," it said. The tribunal also directed that the report submitted earlier by the CPCB with regard to pollutants needed to be rechecked with regard to pollution levels of ammonia downstream at Khojkipur drain No 2 and Khojkipur drain, as figures appearing in it appear to be incorrect.

The NGT had earlier directed the Delhi and Haryana governments to hold a meeting to resolve the issue of high ammonia content in the water being provided to the national capital. Delhi Jal Board (DJB) had moved a plea in the tribunal plea alleging high ammonia in water being provided by the Haryana government to Delhi. CPCB had submitted its analysis report of ammonia at Tajewala in Haryana, Wazirabad water treatment plant, Okhla and ITO barrage in Delhi.

Read more: <http://indianexpress.com/article/india/identify-and-address-sources-of-pollution-in-yamuna-ngt-5078932/>



## IN A FIRST, SCHOOL IN NOIDA INSTALLS DISPENSER FOR SANITARY NAPKINS

Source: *The Times of India*, Noida, Feb 27, 2018

The Mahamaya Balika Inter College in Sector 93 has become the first government school in Noida to get a vending machine for sanitary napkins in its hostel on Monday. Students and hostellers were given demonstration on the functioning of the machine which has been donated to the school by an NGO on Monday. Girls can get one sanitary napkin at a time by putting a one-rupee coin in the machine. "This can be a great help in emergency situations when a need for the sanitary napkin arises. We will be able to evade embarrassing situations," Priyanka, a student of Class XI told.

Another student said the vending machine will especially help those students who start menstruating for the first time and who do not have a fixed menstruation cycle.

Students said that such a machine should be installed in all the girls or co-education schools. Later, a session was also held with the students with a gynaecologist about personal hygiene where students discussed their gynaecological problems.

Sheema Krishna, a gynaecologist associated with a private hospital in Sector 27 said the students came forward with many teenage-related problems while some complained of irregular periods.

Read more <https://timesofindia.india-times.com/city/noida/in-a-first-school-in-noida-installs-dispenser-for-sanitary-napkins/articleshow/63087047.cms>

## GOVT SANCTIONS RS 1200 CR TO CLEAR POLLUTION IN DELHI

Source: *Asian Age*, New Delhi, feb 26, 2018

NITI Aayog CEO Amitabh Kant on Monday assured Delhiites that their city, which has earned an unenviable distinction of being the most polluted city in the world, will not face a pollution problem, this year.

"The government of India has cleared the scheme of Rs 1200 crores which I am sure will ensure that this year from October to December, during the peak period we do not have pollution on account of agriculture residue from our neighbouring states," Kant said at Cleaner Air-Better Life programme organized by CII.

Kant listed out various measures and also added that after the recommendation, the challenge now lies with the administrative machinery both at the state and municipal level.

“This required a huge amount of administrative will to ensure that roads are paved. A huge amount of plantation is done. A push for ensuring constant checks of the vehicle. Penalise those who are not able to live up to the environment control. Check power plant which are not meeting environmental controls including diesel gensets and taking action against them. It requires a huge level of administrative pull to push this through,” he said.

Read more: <http://www.asianage.com/india/all-india/260218/govt-sanctions-rs-1200-cr-to-clear-pollution-in-delhi.html>

### **GANGRENE ENERGY! FURY AT PLAN TO BURN BODY PARTS AND MEDICAL WASTE TO POWER HUNDREDS OF HOMES**

Source: *Dailymail*, 23 Feb 2018

Residents in a small Sussex town have expressed fury at plans to power hundreds of homes by burning ‘body parts and organs including blood bags’. The plans to convert medical waste such as bandages, blood products and nappies into clean energy has alarmed residents who fear the process could lead to an over industrialisation of the town and cause air pollution. MediPower is seeking permission to build an incinerator in Newhaven which will convert 1,200 tonnes of medical waste and turn it into electricity. Local businessman Michael Burns, 62, the brains behind the idea, has claimed he has a ‘lead on the world’ in creating clean energy from a combination of plastic and biomass.

His firm plans to use a gasification process whereby it is heated to produce a synthetic gas which is ignited and converted into thermal energy.

The plant - based at the East Quay of Newhaven port - could burn 12 tonnes of medical waste a day delivering electrical and thermal energy to the port authority and local companies.

Read more: <http://www.dailymail.co.uk/news/article-5425581/Plan-burn-BODY-PARTS-medical-waste-power-homes.html#ixzz5BgCc98Yp>

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### **ARE BIODIVERSITY PARKS HELPING THE CITY'S ENVIRONMENT? DELHI UNIVERSITY EXPERTS TO FIND OUT**

Source: *Hindustan Times*, Feb 25, 2018

A team of researchers from Delhi University will be carrying out a series of studies over the next few years to find out how biodiversity parks are functioning in Delhi and benefiting its environment. Delhi currently has four functional biodiversity parks with two more coming up. Biodiversity parks are nature reserves, which harbour natural heritage and have functions like carbon sequestration — a process in which carbon dioxide is removed from the atmosphere and stored in the plant body and soil, recharging groundwater and controlling the microclimate of an area, among others.

“We have initiated some studies. Over the next few years we will undertake more studies to find out how these parks are functioning — the amount of carbon they are able to sequester and whether they are able to recharge groundwater and control local temperature,” said CR Babu, who heads the biodiversity parks project of Centre for Environmental Management of Degraded Ecosystems (CEMDE) at DU.

Read more: <https://www.hindustantimes.com/delhi-news/are-biodiversity-parks-helping-the-city-s-environment-delhi-university-experts-to-find-out/story-8k1VpJcKNWoG-VPNdzt5mLK.html>

### **DAL LAKE FIGHTS FOR SURVIVAL AS POLLUTION LEVELS GO UP**

Source: *The Tribune*, Feb 16, 2018

Forty-year-old Farooq Ahmad covers his mouth as he steps out of his small wooden provisional store inside the Dal Lake. The water stinks and heaps of weed and garbage can be seen on the surface of the lake which was once pristine. Houseboat owners, locals, and boat riders are disappointed with the failed efforts of the government to bring back the glory of the lake. “I have grown up here and it is disappointing to see the lake dying,” says Ahmad, a lake dweller. On October 2 last year, Chief Minister Mehbooba Mufti had visited the interiors of the Dal Lake and expressed her concern towards the rising pollution levels

in the lake. She said she would monitor the cleaning of the lake periodically. However, despite her visit, nothing changed.

Shahzada Begum, 45, a Dal dweller, says her children have fallen ill due to the foul smell of the lake.

“We are suffocating. For the last few months, the lake has witnessed a sharp rise in pollution. The government is not doing anything,” she rues.

The lake faces a bleak future, as the sewage and high-nutrient load continues to flow through it.

Read more: <http://www.tribuneindia.com/news/jammu-kashmir/dal-lake-fights-for-survival-as-pollution-levels-go-up/544523.html>

### **DELHI-NCR GENERATES 5,900 TONS OF MEDICAL WASTE PER ANNUM: ASSOCHAM**

Source: *The Hindu*, New Delhi, Feb 9, 2018

Though lack of proper disposal of hospital trash can pose a serious risk to the health of people and the environment, Delhi-National Capital Region generates over 5,900 tons of medical waste annually — most of which remains untreated and is dumped along with municipal waste. ASSOCHAM's latest findings state that the Capital alone generates around 2,200 tons of biomedical waste. The study also looked at Gurugram, Faridabad, Noida and Ghaziabad. India has seen unprecedented growth in the number of hospitals across the country.

Non-treated hospital waste always causes public health risks, including AIDS, Hepatitis B and C, gastroenteric infections, respiratory infections, bloodstream infections, skin infections, effects of radioactive substances and intoxication.

“We have to ensure that waste disposal is done as per policy guidelines framed by the State government,” said ASSOCHAM secretary-general D. S. Rawat.

Read more: <http://www.thehindu.com/news/cities/Delhi/delhi-ncr-generates-5900-tons-of-medical-waste-per-annum-assochem/article22696698.ece>

## RESOURCES

### TOXIC IMPRESSIONS: BPA IN THERMAL PAPER



With an objective to detect the presence of Bisphenol-A (BPA) in thermal papers used in different stores in Indian market and to highlight the need of BPA regulation for thermal papers in India, Toxics Link has released a report titled 'Toxic Impressions: BPA in thermal paper'.

BPA is a well known endocrine disrupting chemical which can cause serious health hazards, claimed by various studies.

The erstwhile report had confirmed the BPA's presence in thermal paper. Thermal papers are widely used by retailers to print the sale receipts in various sectors like grocery stores, gas stations and bank ATMs to ensure fast and accurate services. It is also used by ticketing agencies, lottery systems and other businesses which require accurate and high volume print outs.

Since India doesn't have any downstream management system in place for the used thermal papers, it has high probability that BPA from the thermal paper will leach into the environment and contaminate the ecosystems. The study proposes some recommendations which include taking receipts only when it is really required; go for online receipts; wash your hands after touching the thermal receipts. The report also suggests that India should regulate BPA in thermal papers to minimize the risk and impact on human health and environment

There is also a possibility that these BPA containing thermal papers may get recycled and contaminate the other products. It is suggested to develop suitable guidelines for the overall management of these papers. Awareness generation is also found as a key factor to minimize the risk of

### CLEANING CLOTHES:



"Cleaning Clothes", a report on the chemical solvent PERC used in dry-cleaning, is released by Toxics Link.

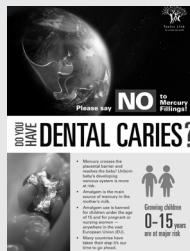
Dry-cleaning is the process of cleaning garments using liquid chemical solvent instead of water. Perchloroethylene (PERC), also known as Tetrachloroethylene, is the most widely used chemical by the dry-cleaners around the world.

Although, this solvent has many advantages for the dry-cleaning industry as it is non-flammable, can be reused, making it cost effective, and it also doesn't cause garments to shrink and dyes to bleed, PERC has been found toxic for both human health and environment. Several agencies such International Agency for Research on Cancer (IARC) have confirmed high probability of PERC being a Carcinogen.

Its usage in the dry-cleaning industry has been under a scanner for long and has resulted in many studies to look at the effects of exposure, mainly to workers. One of the researches clears that dry-cleaning workers who routinely breathe excessive amounts of the solvent vapour or spill PERC on their skin are at risk of developing health problems. PERC is also retained in dry-cleaned clothes and there is a real possibility of exposure to customers, which could include children and the elderly.

Some of the recommended preventive measures include the use of newly designed machine (closed looped) reduces the amount of PERC vapours released into the air, inside the units as well as outdoors. Retrofitting the dry-cleaning machinery with emission control mechanisms to reduce fugitive emissions is also a tried and tested way of reducing exposure to PERC. Adequate ventilation is a must in dry-cleaning units. General ventilation through overhead fans and local exhaust ventilation can help reduce PERC levels within the units. Personal protective equipment (PPE) like aprons, gloves, goggles and respirators can also be of help to workers and can reduce the risk of PERC exposure. Workers engaged in dry-cleaning operations must go through training on PERC risks and measures to protect themselves from the hazards of PERC. Training should also be provided to ensure proper usage of PPEs. It is or exposure is documented and steps are taken to mitigate them.

### DO YOU HAVE DENTAL CARIES?



It is a poster describing the harmful effects of amalgam as it is a primary source of mercury and the need of its ban in India. Considering the harmful effects of amalgam, it is banned for children under the age of 15 and for pregnant or nursing women in anywhere in European Union (EU). Mercury crosses the placental barrier and reaches the baby.

Unborn baby's developing nervous system is more at risk. Amalgam is the main source of mercury. Many countries have banned amalgam, now it's our turn to take step in the same direction.

### DO YOU KNOW WHAT IS BEING USED IN YOUR MOUTH?



The poster titled 'Do you know what is being used in your mouth?' reads about the various means through which mercury enters our mouth and insists to adopt the mercury-free alternatives to be safe and to go green. It also says that the use of mercury in clinics leads to entry of mercury into air, water, land and our food chain.



## TRAVELING FILM FESTIVAL- "QUOTES FROM THE EARTH"

Along with the biennial "Quotes from the Earth", Toxics Link also organises travelling film festival at cities, towns and remote locations of our country. The purpose is to provide a platform for local residents/institutes to connect their surrounding issues with that of larger global environmental concerns, to further enhance awareness and strengthen the policy advocacy initiatives at all levels. The travelling film festival is organised with support of local civil society organisations or schools or any other environment based institution. If you are interested in organising "Quotes from the Earth" in your area, please write to us or call us at our office numbers.



## PHASING OUT BPA!

It's almost impossible to find a product that does not have synthetic chemical added into it, and one of them is the commonly used baby feeding bottle containing the chemical BPA in it. BPA or Bisphenol-A found in baby feeding bottles play the role of Endocrine Disruptive Chemicals (EDCs) that are capable of harming infants and newborn babies. Many countries have banned it as a precautionary measure. Toxics Link has been campaigning against the chemical and released a lab tested report titled "Bottles can Be Toxic" that received considerable attention from all stakeholders including the media. The report was also discussed during winter session of the Indian Parliament. Currently, we are having dialogues with Bureau of Indian Standards to completely phase out BPA from India. Join us in our campaign against BPA.

## TOXICS LINK LIBRARY-A TREASURE HOUSE OF KNOWLEDGE

The library of Toxics Link houses a variety of books, magazines and reports which are well-stocked, classified and indexed, for the benefit of the readers. One can also get the entire collection of around 520 documentary films from around the world on various issues concerning environment. It has over 4900 books and research based reports; and new books, magazines and periodicals are added from time to time. One can also find media coverage on environment that are updated on a regular basis. Besides, the library also has stock of parliament questions that are raised on the research based studies on environment done by Toxics Link. The readers can find all the studies done by Toxics Link on its website.

## TOXICS ALERT (E-NEWS)

### An environment news bulletin

Visit: <http://enews.toxicslink.org/>, for our monthly e-newsletter on environment related news, articles, policy interventions, events on toxicity and its management. You can also subscribe to receive its update via e-mail.

## KEEP YOUR HOSPITALS CLEAN & GREEN WITH TOXICS LINK

The Clean & Green Hospitals (CGH), an initiative of Toxics Link, in association with STENUM Asia Sustainable Development Society, is aimed at supporting and facilitating health care facilities in the country to provide environmentally sustainable health-care to the masses. It also offers handholding support for hospitals to implement its suggestions which includes capacity building of internal resources. Besides, CGH has an array of training and awareness materials meant at aiding the process of greening the hospital. Please write to us or call us to get detail information about the support that we provide.



Toxics Link

for a toxics-free world

## STAY CONNECTED

For more information materials, invitations and updates on environmental issues please write to us at [info@toxicslink.org](mailto:info@toxicslink.org)



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