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**EDITORIAL****'Highway of Industry' through our bodies***G. Himashree**Editor-in-chief, Journal of Krishna Institute of Medical Sciences University,  
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**Introduction**

The invisible and insidious intrusion of industries into our existence is causing irreversible and irreparable damage to our health that is transgressing generations. Industries have always been and are the hub of production. A few decades ago, the location of these machine intense production centres was intentionally kept away from residential areas. In pursuit of convenience, livelihood, and connectivity, people began settling around these industrial zones. Roads improved, cities expanded, and what were once remote factories now stand amid growing urban clusters.

This proximity for convenience has come with a huge health penalty. The industry has moved in—not just into our neighbourhoods and cities, but into our homes, our kitchens, our air, and now, into our very bodies. Microplastics, chemical residues, airborne particulates, and industrial by-products travel pathways once unimaginable—through our water, food, and even the womb [1]. The line between “outside” pollution and “internal” harm has blurred. The highway of industry, once physical and external, now runs straight through us.

**Microplastics and Polyfluoroalkyl Substances (PFAS): Forever chemicals**

This is the era of smart solutions in all spheres of life. Along with these novel solutions have crept in these 'forever chemicals' which are man-made, indestructible, and uniquely threatening because of

their ease of entry into our bodies, persistence, bioaccumulation, and combined toxicity. A number of studies have now reported presence of micro- and nanoplastics in human organs including blood, lungs, liver, kidneys, brain, placenta, and stool [2-4]. Studies have indicated the probable role of these chemicals in inflammation, oxidative stress, cytotoxicity, and hormone disruption. To compound this exposure are the adsorbed toxins on these particles that too enter our systems to compound the deleterious effects of these hazardous unwelcome invaders. Polyfluoroalkyl Substances (PFAS) compounds, such as Perfluorooctanoic Acid (PF-OA) and Perfluorooctane Sulfonate (PFOS) are epidemiologically linked to liver dysfunction, elevated cholesterol, endocrine disruption, infertility, developmental delays in children, and increased cancer risks [4]. They are also known to reduce vaccine responses, Impair Antibody Production (IgM, IgG) and decrease natural killer cell activity. The synergistic presence of microplastics and PFAS amplifies the toxic nature of the chemicals. Microplastics facilitate PFAS transfer and bioavailability, while PFAS adsorbed to plastics may enhance cellular toxicity and inflammatory responses upon ingestion or inhalation [2-4]. Microplastics also act as chemical magnets. Heavy metals (lead, cadmium), endocrine disrupting additives like Bisphenol A (BPA) and phthalates, and persistent organic pollutants such as Polychlo-

rinated Biphenyls (PCBs) and dioxins are found adsorbed on them [5]. All these adsorbates are known to be carcinogens or hormone disruptors. Eco-friendly products of personal care, daily use salt and sugar, bottled water, single use plastic packaging, synthetic textiles and many other apparently harmless parts of our daily life are all significantly contributing to the silent entry of these chemicals into our body. In India, in 2024, Food Safety and Standards Authority of India (FSSAI) has launched a project “Micro- and Nano-Plastics as Emerging Food Contaminants”, in partnership with CSIR-Indian Institute of Toxicology Research (Lucknow), ICAR-Central Institute of Fisheries Technology (Kochi), and BITS Pilani to estimate the threat and formulate policies to contain this novel and modern health hazard [6].

#### **Modern farming: Boon or bane?**

Beginning from the “green revolution” to the current 'high yielding, technology intensive farming' we have come a long way on the path of 'Soil to Systemic Harm'. This paradigm shift in understanding agriculture has definitely averted famines and boosted production but at the cost of irreversible ecological and health detriment. We are all caught in the vicious cycle of soil degradation due to chemical overuse, monoculture cropping, and excessive tilling that has reduced microbial health and natural nutrient cycling, and to obviate this and increase yield, usage of pesticides, neonicotinoids, hormones [7]. What should have been healthy food is now abundant but hazardous. Food has become a vector of invisible and undesirable yet inescapable toxins. A number of studies all over the world have linked our modern agro products are the route of entry for the agrochemicals into our body. Evidence is there to indicate the possibility of endocrine

disruption, reproductive disorders, developmental and neurological impairments, immune dysfunction, and elevated risks of cancers in the population exposed to these chemicals. Regenerative practice like no-till, cover cropping, integrated livestock systems, relay cropping, organic composting and multicropping are being adopted now to improve soil fertility, increased yields, reduced costs, and avoid chemical inputs altogether, restoring both community and land health [8]. This will close the loop on agro chemical dependence by enhancing soil diversity, sequester carbon, and yield nutritious food while suppressing pests naturally.

#### **Slow erosion of health through modernisation: illusion of progress?**

Obesity and other life style disorders are the gifts of technological advancement to the society. Not only our physical health but also our mental health and cognitive well-being are all getting affected in more ways than one in today's world. Whether we talk of modern fabric that we wear, or the advent of ubiquitous multiple blue blinking screens and information onslaught through digital media, all these are significantly corroding our cognition, attention span, mental and social wellbeing. A state of hyper-vigilant distraction that reduces deep thinking and emotional regulation has become a routine way of life. Mobile phones constantly emit low-level radiation linked by some studies to sleep disturbances, headaches, and even potential long-term neurological risks. Beneath the glossy 'green technology' are the guzzlers of water and electricity which are a paradox in themselves. The electric vehicles, data centres, IT hubs fall in this group [9].

To summarise, faster roads, seamless connectivity, synthetic comforts, and digital ease obscures the complex trade-offs between convenience, health,

and environmental integrity. Industrialization has woven itself into our wardrobes, meals, homes, and even the very air we breathe, often in ways unseen and unacknowledged. As the “global village”

shrinks, the challenge remains to reconcile the benefits of development with the imperative of sustainability and well-being.

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