The Fall Guy Named **'Plastics'**

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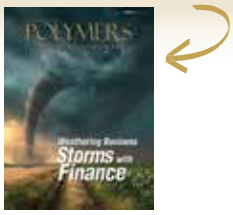

In August 2015, marine conservation biologist, Christine Figgener spotted a sea turtle with something protruding from its nostril. The team sensed the discomfort of the hapless creature and managed to extract the offending object. It turned out to be a plastic straw. The entire episode was captured on video and posted in social media. It catapulted her to the status of a celebrity and hurtled plastic straw in the centerstage of debate on plastic pollution. The turtle swam back to safety (!) and probably forgotten, but the plastic straw continues to be in the limelight in public debate on pollution. So do plastic bags, allegedly mistaken as jelly fish by marine predators, and fishing nets entangling fish and other aquatic species, eventually lead them to their death?

While Dr. Figgener admitted that plastic straw accounts for a minuscule part of marine litter, the video amplified the narrative and created an unprecedented backlash against plastic straw. A highly otherwise credible media even reported of an average of 500 million straws being used in America every day. The source of this story, as quoted by Dr. Chris DeArmitt in his book, The Plastics Paradox, is a 9 years old school

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student, Milo Cress. This phenomenon is neither an exception nor unusual.

It is not just straws. It is also bags, PET bottles, disposable food containers and cutleries. The latest entrants are micro- and nano-plastics largely originating from washing of clothes. Our atmosphere is replete with wide-ranging micro- and nano-particles. It includes dust, smoke, pollens and many green-house gases (GHGs). Of these, carbon dioxide and methane are the major ones. While some of these atmospheric pollutants have silent, but debilitating impact on life, debate on micro- and nano-plastics tends to obscure this. It is still not clear how impactful is the presence of micro- or nano-plastics on human health or on terrestrial and marine biota.

Presence of micro-plastics was initially reported in drinking water and subsequently in fish guts, pointing to a potential pathway to human system. Recently reported finding of micro-plastics in human placenta, which needs to be thoroughly investigated and its potential impact on health of newborn babies evaluated, has resulted in a major media blitz. All these expressions of concerns, many of them genuinely deserving thorough investigation, tend to get amplified with the word 'plastics' associated in these reports.

Are We Doing Right? Let's Introspect...

Most plastics by nature are chemically inert and hence widely used in food-contact and medical applications. It is, however, prudent to be cautious and dispassionately carry out a risk-reward analysis before condemning plastics in general. A larger than life expression of potential harm, in the long run, may be counterproductive.

Dr. Pragya Agarwal, a behavioural scientist in her book, Sway: Unravelling Unconscious Bias, offers us some clue to this overblown perception of potential harm. To quote from her book, "We respond more strongly to negative news than positive stimuli. There is also a tendency to confirm a hypothesis, rather than falsify it." Both these factors come together to vilify not just plastic straw, but many other widely used products. Mercifully, plastic multi-layer packaging, extensively used in packaging applications due to their excellent barrier properties and low cost, forming a major part of the single-use plastic waste, do not get the bad press. Here lies the plastic dichotomy.

Many multi-layer rigid structures combine different materials besides plastics. Some have exterior layer of paper giving these an environment-friendly (deceptive) look. Due to the complex structure, these are not only more expensive, but also more difficult to recycle. The extra cost is, however, picked up by the consumers of the goods packed.

Numerous plastic packaging materials and products are used in food sector, in medical and healthcare, in transportation, building and construction and in our day-to-day life. It is ubiquitous around us offering substantial benefits which cannot be ignored. In all these applications, at some point in time, their usefulness ceases and join the waste stream. A large part of these wastes is at present recycled, or their inherent energy content recovered through incineration. There is, however, a need to upgrade the recycling sector in terms of hygiene, safety, technology and product quality.

Despite all the benefits that plastics bring, the overarching narrative continues to be negative. Numerous studies have demonstrated that environmental footprints of plastic products are lower as compared to alternatives - be it made of metal, glass, paper or cotton. Meta-analysis of plastic bags, beverage bottles and disposable cutleries conducted by United Nations Environment Program (UNEP) underscores this. In all these reports, littering is highlighted as a major consideration for any regulatory initiative.

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While plastic pollution is real and visible, climate change is not so apparent. But it has more devastating consequences. Acidification of ocean resulting is aquatic bio-diversity losses, global warming due to build-up of GHGs in atmosphere, receding icecaps in polar regions, loss of landmass to rising sea levels; all point to a brewing crisis and approaching emergency. Relatively lower energy and material footprint of plastic products per unit of utility, as compared to alternatives, clearly demonstrate the need to move more towards plastics than reverting to traditional alternatives.

Apparently, the problem of plastic pollution lies elsewhere and so is the solution. It is in our perceptions and behavioural changes. Regulating or eliminating few less consequential plastic products would be counterproductive. The alternatives would not only compromise functionality and affordability, but also put additional burden on the environment. There is a need to shift our focus from regulating or eliminating few products to creating awareness and hastening behavioural changes. This, coupled with commensurate investment in infrastructure, can effectively meet the plastic pollution challenge. This pandemic has demonstrated that this change in human behaviour is possible. Let 'plastics' not be the fall guy.