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PLASTICS IN 2020, WHERE AND HOW DO WE GO FROM HERE …!!

Padmashri, Dr S Sivaram the former Director of CSIR National Chemical Laboratory in Pune and an authority on polymers, says that the first step in plastic waste management is changing the mindset of India's citizens to littering .His work in polymers and study of the problems of plastics waste and how to find solutions is indeed remarkable .

This is easier than done. The other is the attitude of various stake holders. In spite of the fact that land is fast running out in urban India, the urgency for effective and long term sustainable solution for MSW disposal in our cities is not there. One needs fresh thinking to find solutions . India is likely to produce over 500 million tpa of urban waste by 2050; and 80 % of this will come from cities.

Plastics are the workhorse material of the modern economy. Their popularity has kept the industry growing for 50 years, with global production surging from 15 million metric tons in 1964 to 311 million metric tons in 2014. If business proceeds as usual, this number is projected to double to more than 600 million metric tons in the next 20 years. Yet functional benefits come at a price. Plastic packaging, especially, is the quintessential single-use product: it represents a quarter of the total volume of plastics, and around 95 percent of the value of plastic-packaging material (worth some $80 billion to $210 billion annually) is lost to the economy. And while its intended useful life is typically less than a year, the material lives on for centuries.

Consumers benefit from the advantages in cost, convenience and energy efficiency that single-use items provide. But using items like plastic shopping bags, bottles, utensils and straws requires users to commit to disposing of them properly—whether that means recycling them or, at the very least, ensuring they make their way into a proper waste receptacle.

When disposed off single use plastics have smaller environmental footprint than reusable material. They are also used in medical industry for their advantages

While it's better for single-use plastic products to end up in a landfill than to become litter, the ultimate goal is that all these products can be collected and converted into energy or recycled

''It is widely recognized that plastics have a crucial role to play in delivering a more sustainable future. Through their unique combination of light-weight, durability and other intrinsic properties, plastic materials already contribute to reduce GHG

emissions making a more efficient use of our resources across a range of different sectors and everyday applications. As a result of their versatility and capacity for innovation, our materials are also invariably best placed to support breakthrough sustainable technologies in areas such as sustainable mobility, smart and efficient building, sustainable agriculture, food conservation or in the healthcare and medical sector, to name only a few. However, challenges relating to littering and end-of-life options for certain types of plastics waste —especially packaging waste— must be addressed if the material is to achieve its fullest potential in a circular and resource efficient economy.

It is in this part and spirit of commitment to future generations, that Plastics Europe has decided to set a series of ambitious targets and initiatives up to 2030 that are focused on the key areas of preventing leakage of plastics into the environment, improving resource efficiency and increasing recycling and reuse rates.

The Plastics 2030 Voluntary Commitment focuses on preventing leakage of plastics into the environment, 0n improving resource efficiency and the circularity of plastic packaging applications. “Plastics 2030”: making Circularity and Resource Efficiency a Reality Prevent leakage of plastics into the environment. Improve resource efficiency. Improve circularity of plastic packaging. Different plastics for different products All play a role in a circular economy By increasing engagement inside and outside our industry. By accelerating innovation in the full life cycle of products. By reaching in 2040 100% reuse, recycling and/or recovery of all plastic packaging in the whole EU. In 2030: 60% reuse and recycling of all plastic packaging. and through the regulatory support of the EU institutions.

Some of the noteworthy commitments are:

*Improve resource efficiency and circularity of plastics Prevent the leakage of plastics into the environment

* Prevent littering: identification and littering prevention solution of most found items into the environment.

* Prevent pellet loss

*Changing consumption habit and prioritizing durability packaging against short term disposability of waste should be the path forward in the medium and long term to create a better and sustainable future,

“**The funny joke is that you may know now that the Olympic medals are circular as they are made from cell phone waste. So, if you work really hard and spent a decade winning your sport in the Olympics, you will get a piece of garbage (medal made from recycled materials), standing on a garbage in Tokyo Olympics,” joked Szaky.**

Changing the view in 2020 :**Choose a bottle made 100% from recycled plastic in**

the new decade in 2020

As it is in every product sector if you can’t remove it, buy less and buy better. So, what does better look like?

You take a plastic bottle and you remove all of the fossil fuel element of the raw material. You make it 100% recycled plastic. A bottle made completely from bottles.

What should one do?

Quite simply, we all need to do the same: use less.

As consumers, we should strive to remove as much of all format single-use from our lifestyles – bottles, cans, cartons, trays and bags. And when it comes to water, if you do forget that refillable, or if filtration isn't yet a viable option for your business, this doesn't make you a bad person.

Goldman Sachs **released a report on the effects of climate change** in 2019 end on cities around the world, and it makes for grim reading.

The bank's Global Markets Institute, led by Amanda Hindlian, warned of significant risks to the world's largest cities, which are especially vulnerable to more frequent storms, higher temperatures, rising sea levels, and storm surges.

JPMorgan and Goldman Sachs say 2019 is the year climate change is at the top of investors' minds.

Circular rethink

If there's one thing on which all waste experts will agree it's that the linear make-use-dispose model on which we built our society needs ditching for good. It's all about going "circular" these days. But weaving our economic systems into one harmonious, never-ending bundle of recycling and reuse is no easy task.

For starters, it means a massive overhaul in how waste is conceived. Even the word is loaded: "waste" isn't actually wasted material, says Marcus Gover, director at the UK advocacy group WRAP, it's a valuable commodity. And the first companies that need to recognise that are the waste (or should that be value?) management companies.

A similar rethink is required of designers and manufacturers too. The goods of today, need to be seen as the raw materials of tomorrow.

Steve Lee, chief executive of the Chartered Institution of Wastes Management, gives the example of carbon fibre. On the one hand, it's at the "cutting edge" of transport innovation, with the likes of McLaren and Airbus excited about its advantages in terms of strength, weight and energy efficiency. But little serious thought has gone into its re-use or recycling. Closing these "resource loops" is essential, he adds. "We will also need more clever technology to separate materials quickly and efficiently for recycling."

Convincing consumers

It's not just business that needs to change. Between now and 2025, public attitudes to waste require a radical overall too.

Retailer responsibility

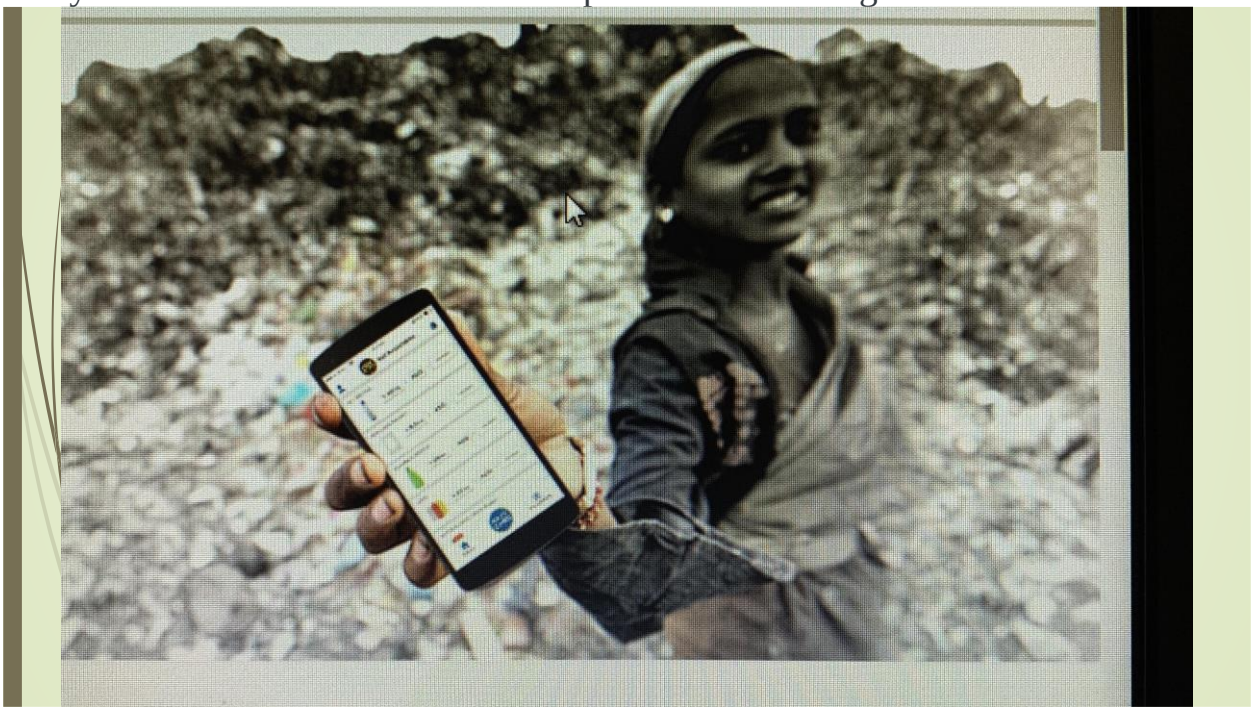
Responsibility for consumer-related recycling shouldn't fall entirely on consumer shoulders. Retailers that sell unrecyclable packaging should also make a change, argues A through can be achieved through implementation of cutting-edge technology an unprecedented level of cooperation and coordination between recyclers, designers, packagers, manufacturers, businesses, municipalities, governments, and others.

WHAT WE WILL SEE IN 2020 AND BEYOND……

#1 Computer technology will be used in various ways to aid in waste management.

Computerized methods will continue to be created to aid with, and enforce, the division of waste from recycled materials Waste and recycling solutions will involve the collection of data to meet sustainability and energy goals. Products will be tracked throughout their lifetimes. Business models will be created based on product

lifecycle data so as to prevent the generation of waste



#2 Composting initiatives will take place along with more recycling programs.

In 2020, compost infrastructure will expand in many areas, especially in areas that have food waste recycling

#3 We will see plastic waste made into high-quality resin that will replace the current greenhouse gas-emitting prime resin that is used in the plastic industry.

#4 Researchers will look at ways that waste can be converted to energy

These include circular economy measures, on-demand service, and anaerobic digesters. Circular economy measures include purchasing wasted food's "energy." Technologies will soon be able to treat food waste onsite.

#5 The recycle industry will continue to put pressure on WTE projects.

. Developing economies are not aware of the benefits of WTE, and that is expected to inhibit growth of the recycling industry .A change in thought is needed

#6 Governments will continue to promote waste to energy (WTE) efforts.

#7 Municipalities and the government will be more involved in waste recycling, creating regulations for collecting and processing waste.

Better collection and processing of waste will be possible once cities provide the needed regulations. Government regulations will drive new waste programs#8 **Cooperation and communication between various entities will be key to the success of future waste management solutions**.

#9 Packaging will continue to change into recyclable forms.

Disposable items end up in the trash bin. Trends in the solid waste industry are causing major changes in packaging.

#10 Waste management solutions will include thermal ones (incineration, pyrolysis, and gasification) in addition to biological ones among WTE options.

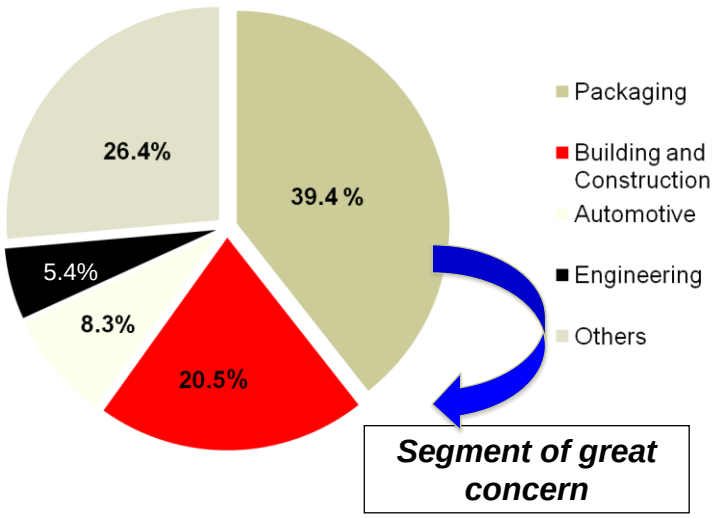
. Thermal technology is a major contributor to the growth of WTE technology. Incineration is a type of thermal technology. It is popular in WTE plants, and it is expected to hold a large share of the thermal technologies used in the future

THREE QUESTIONS THAT A CONSUMER IS LIKELY TO ASK ?

- Is the product I am using "safe" for me ?
- Is the product I am using made with the lowest impact on the resources of the planet ?
- What will happen to this product after my "use"? Where will it end up finally ?

- *Our relationship with nature has changed radically, irreversibly, but by no means all for the bad. Our new epoch is laced with invention. Our mistakes are legion, but our talent is immeasurable"*
- *However, we cannot afford to make more mistakes; the society will not forgive us , if we do* (**FROM THE BOOK THE HUMAN AGE BY DIANE AKARMAN)**

PLASTIC DEMAND BY APPLICATION SEGMENT



INDIAN PLASTICS RECYCLING "INDUSTRY"

- Unorganized, small, often illegal, poor practices on health and safety, fragmented
- No value accretion by recycling. Very often there is value destruction. For example Please see the buy back price printed on every plastic bag, 10 Rs /kg
- Poor segregation leads to co-mingled waste of low value
- Poor efficiency of rag pickers. Now new solutions have to be found, digitization, incentivize, take back programs, deposit refund schemes.

- Recycling cannot be a mere waste handling solution; it has to provide a rate of returns so that organized industry can invest in value up-gradation of waste.

- ***SOME SCIENCE AND TECHNOLOGY GAPS***

✓ Convert short life time waste to long life time products

✓ Polymers for packaging with single composition and the functionality of multilayer materials

✓ Polymers that can depolymerize cleanly into monomers

✓ (polymers with tailored ceiling temperatures)

✓ Polymers programmed for death (Apoptosis)

LABELLING AND IDENTIFICATION

- Compulsory labeling of plastics using identification numbers
- Better systems for numbering to identify sub classes of

materials for easy sorting

- Product sorting technologies: magnetic, eddy current, NIR, fluorescent markers and labels
- Marker technologies to determine how many times a material

has been recycled

- Food compatible markers for easy identification and sorting of plastics using hand held devices
- Access to such are important as we transit to circular economy

STANDARDS AND CERTIFICATION

- India needs to create robust system of standards, and independent testing and certification systems for managing plastics in the environment. This is inadequate
    - Recyclate testing
    - Safety certification of recycled products
    - Biodegradability and compost ability testing
    - Biocarbon testing
    - We need something equivalent to European Bioplastics Certification system or REAL in UK
- *KEY TO SUSTAINABLE PLASTICS INDUSTRY*
- Promote responsible manufacturing and marketing
- Promote responsible consumption
- *Consumption of packaged products leads to urban waste*
- *India's growing middle class is the largest threat*
- *Large scale social engineering needed to bring about behavioral changes*
- *Just like many other problems facing the society, there are no simple answers. So we must avoid offering simple solutions*
- *We need to change the perspectives of the society, government and the industry, in small and measured manner*

PLASTICS ARE BANNED IN SOME FORM OR THE OTHER IN MORE THAN 22 STATES OF INDIA . On the other hand *India's Packaging Industry US $ 32 billion in 2015; US $ 73 billion in 2020, CAGR 18 %*

Solutions in 2020 will continue to be created and implemented,. Recycling, digital solutions , various forms of waste-to-energy efforts, UPSCALING, will also take a much greater role in waste management. New laws along with massive cooperation and coordination between governments, businesses, and individuals will be required to successfully get on top of the situation. EPR and circular economy will be the way forward. An Eye on the Future of waste… waste not the waste, but moving in the right direction with focus in 2020 is thw way forward.

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