

Role of Recyclers in Sustainable Management of Plastics

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In March 2016, the Ministry of Environment, Forest and Climate Change (MoEFCC) published the Plastic Waste Management (PWM) Rules 2016 with the objective of plastic waste minimization in the country.

Extended Producers Responsibility (EPR) is the central tenet of the PWM Rules, 2016.

PREAMBLE



Registration of producer, recyclers and manufacturer PWM Rules 2016, s.13

(1) No person shall manufacture carry bags or recycle plastic bags or multilayered packaging unless the person has obtained a registration from the State Pollution Control Board or the Pollution Control Committee of the Union Territory concerned, as the case may be, prior to the commencement of production;

(2) Every producer shall, for the purpose of registration or for renewal of registration, make an application to the State Pollution Control Board or the Pollution Control Committee of the Union territory concerned, in Form I

(3) Every person recycling or processing waste or proposing to recycle or process plastic waste shall make an application to the State Pollution Control Board or the Pollution Control Committee, for grant of registration or renewal of registration for the recycling unit, in Form II.

(4) Every manufacturer engaged in manufacturer of plastic to be used as raw material by the producer shall make an application to the State Pollution Control Board or the Pollution Control Committee of the Union territory concerned, for the grant of registration or for the renewal of registration, in Form III.



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Comprehension Of Plastics



Plastic Information

1

Plastics are polymers which are large, complex molecules, built up from many smaller and repeating units known as monomers

2

Thermoplastics are recyclable

- PET
- PE
- PP
- PVC
- PS

3

Thermoset Plastics are not recyclable

- PU
- Nylon
- Polycarbonates

Identifying Plastics



Bioplastics/Biopolymers

Two Concepts

1. Material sources: Bio-based polymers

Plastics derived from renewable biomass sources, like plants and microorganisms

2. Functionality: Biodegradable or compostable

Very important to understand differences to avoid confusion in segregation, recycling and waste management



Degradability,
Biodegradability
& Compostability
of Plastics

Source:
<http://www.bpf.co.uk/plastipedia/polymers/polymer-bio-based-degradables.aspx>



Degradability

“A plastic can be described as degradable when it undergoes a significant change in initial properties due to chemical cleavage of the macromolecules forming a polymeric item regardless of the mechanism of chain cleavage i.e. there is no requirement for the plastics to degrade due to the action of naturally occurring micro-organisms. Examples of degradable plastics include, oxo-degradables and UV-degradables which break down when exposed to oxygen or light and are primarily oil-based.”

Biodegradability

“Biodegradability can be described as "the degradation of a polymeric item due, at least in part, to cell-mediated phenomena. As a result of the action of micro-organisms the material is ultimately converted to water, carbon dioxide, biomass and possibly methane.”

“The ability of a polymer to biodegrade is independent of the origin of its raw material. Instead it strongly depends upon the structure of the polymer. For example, whilst some bio-based plastics may be biodegradable (e.g. polyhydroxyalkanoates) others are not (e.g. polyethylene derived from sugar cane).”

Compostability

“For a plastic to be considered compostable it must meet the following criteria:

Biodegrade; break down into carbon dioxide, water and biomass. 90% of the organic materials is converted into CO2 within 6 months.

Disintegrate; After 3 months' composting and subsequent sifting through a 2mm sieve, no more than 10% residue may remain

Eco-toxicity: the biodegradation does not produce any toxic material and the compost can support plant growth.”

“A plastic therefore may be degradable but not biodegradable or it may be biodegradable but not compostable (i.e. it breaks down too slowly or leaves toxic residues).”

Recycling Plastics





Plastic
products
make our lives
easier and
comfortable



Yet seen as
the villain

Plastics are the most ubiquitous waste generated in India

The plastic waste ends up in landfills, water bodies, soil, and as litter

The waste causes damage to the environment and health



In India ~26,000
tonnes/day Plastic
waste generated



94% of Plastic
waste is
thermoplastic
which is recyclable

Source: CPCB



Plastic Waste Streams

Municipal Solid Waste

- *Post consumer plastic packaging materials, bottles, trays, bags etc.*

Industrial

- *Molding scrapes, pellets, containers, packaging material*



Plastic Recycling Processes: Mechanical & Feedstock

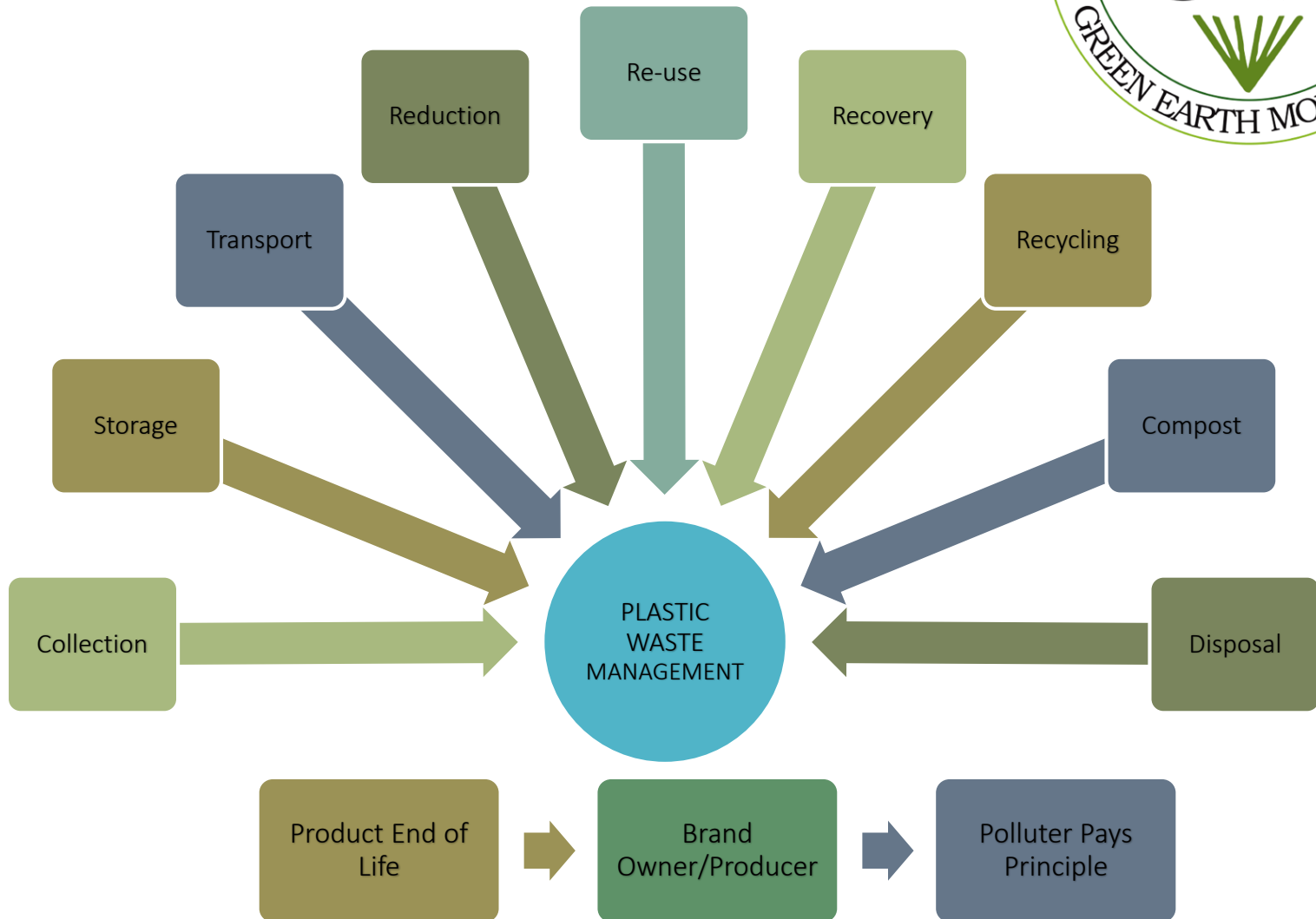


Sustainable Recycling of Plastic Waste





EPR: Public Policy



Individual Responsibility

- Producer takes responsibility for end-of-life management of their own products

Collective Responsibility or Producer Responsibility Organizations (PRO)

- Producers in the same product group together fulfil their responsibility for the end-of-life management of their products regardless of the brand

PRO Functions

- Collection of post consumer products
- Ensure recovery and recycling (meet compliance targets)
- Data verification & reporting
- Report to authorities

Prevalent EPR Schemes



Quantification

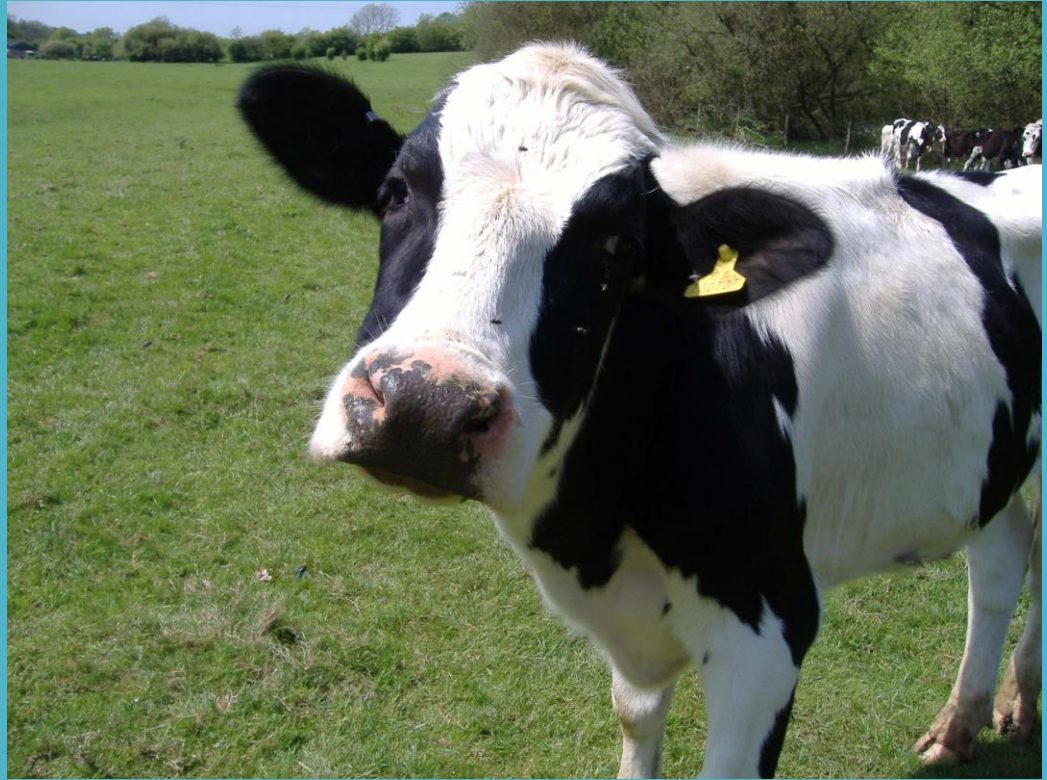
If you can't measure it, you
can't improve it-Peter
Drucker





Informal Sector





Embrace Recycling as Positive Agent for Change



For More
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Keep Calm &
Carry On!
Thank You