BEFORE THE NATIONAL GREEN TRIBUNAL
WESTERN BENCH AT PUNE
O.A. No. 82 OF 2022 (WZ)

IN THE MATTER OF:

RAHUL POPAT PAWAR

..PETITIONER(S)

VERSUS

MOEF & CC & ORS.

...RESPONDENT(S)

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REPLY AFFIDAVIT ON BEHALF OF MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE i.e. RESPONDENT NO. 1.

MOST RESPECTFULLY SHOWETH:

I, E. Thirunavukkarasu, S/o M Elangovan , aged about 54 years, currently working as Scientist "E" at the Ministry of Environment, Forest and Climate Change (MoEF&CC), Integrated Regional Office (IRO) Nagpur, do solemnly affirm and declare as under:-

1. That I, the above named Deponent, authorized by the Competent Authority in the Ministry, New Delhi to swear the present Affidavit.

2. It is submitted at the very outset that the Respondent No. 1 denies each averment and/or submission made in the application which is contrary to and inconsistent with the averments made and facts stated in the present

SEAL OF NOTARY ★ GOVT. OF INDIA ★ Mrs. KHURANA NAGPUR DISTT. (M.S.) REG. No. 6386

reply. It is submitted that nothing stated in the application may be deemed to have been admitted by the Respondent No. 1 unless and until the same is expressly admitted in the present reply.

3. That a short affidavit is being filed by the answering Respondent at this stage and craves leave and liberty to file a detailed Counter Affidavit to the aforesaid application, as and when required.

4. The Ministry vide G.S.R. 320 (E) dated 18th March, 2016 had notified the Plastic Waste Management (PWM) Rules, 2016 which provides the statutory framework for management of plastic waste in the country. A copy of the Plastic Waste Management Rules, 2016 is annexed as **Annexure-R1**.

5. That littered single use plastic items and unmanaged plastic waste have adverse impact on the environment and terrestrial and aquatic ecosystems and have been recognized as one of the reasons of pollution of environment including surface water bodies and soil.

6. That an Expert Committee on single use plastics constituted by Department of Chemicals and Petrochemicals, Government of India had recommended the phase out of identified single use plastics, which had low utility and high adverse environmental impact, as early as possible. A copy of the Expert Committee's report on Single Use Plastic is annexed as **Annexure-R2**.

7. The following five factors of "Utility" were considered by the Committee i.e. (i) Product Safety; (ii) Essentiality; (iii) Social Impact; (iv) Economic Impact, & (v) Hygiene. The following five factors have been considered for assessing the "Adverse Environmental Impact" i.e. (i) Collectability; (ii) Recyclability; (iii) End of Life (EoL) Solutions; (iv) Impact of alternative on the environment & (v) The Littering Propensity.

8. That based on the report of the expert committee, the Ministry identified the Single Use Plastics to be phased out and that the Ministry vide G.S.R. 169(E) dated 11.03.2021 had published a draft notification to bring an amendment to the PWM Rules, 2016, thereby inviting objections and suggestions from all persons likely to be affected thereby & for public consultation.

9. Thereafter, after following due process of consideration of objections and suggestion received, the Respondent Ministry had notified the Plastic Waste Management (Amendment) Rules, 2021 vide G.S.R. 571 (E) dated 12th August, 2021 thereby prohibiting the manufacture, import, stocking, distribution and sale and use of identified single use plastic items, which have low utility and high littering potential, with effect from 1st July, 2022, in order to reduce pollution of environment caused by littered single use plastic items leading to protecting and improving the

quality of the environment. A copy of the Plastic Waste Management (Amendment) Rules, 2021 is annexed as **Annexure-R3**.

10. As such, the identification of single use plastic items for imposition of ban has been based upon thorough examination using defined quantitative criteria based on low utility and high adverse environmental impact by an Expert Committee.

11. Further, management of plastic waste in an environmentally sound manner is governed Plastic Waste Management Rules, 2016.

12. That in view of the aforementioned facts and circumstances, it is most respectfully prayed that this Hon'ble Tribunal may graciously be pleased to pass such other order and further order(s) as this Hon'ble Tribunal may deem fit and necessary in the interest of justice.

DEPONENT

(इ. तिरुनावुक्करसु)
(E. Thirunavukkarasu)
वैज्ञानिक-ई/Scientist-E
पर्यावरण, वन एव जलवायु परिवर्तन, मंत्रालय
Ministry of Environment Forest and Climate Change
एकीकृत क्षेत्रीय कार्यालय, नागपुर-४४०००१
Integrated Regional Office Nagpur-440001

VERIFICATION

Verified at Nagpur on this 2nd day of December, 2022 that the contents of the above affidavit are true and correct to my knowledge and as per official records maintained in the routine course of business. No part of the above affidavit is false and nothing material has been concealed there from.

NOTARY
Mrs. KHURANA
NAGPUR
DISTT. (M.S.)
REG. No. 6386
GOVT. OF INDIA

DEPONENT
(ई. थिरुनावुक्करसु)
(E. Thirunavukkarasu)
वैज्ञानिक-ई/Scientist-E
पर्यावरण, वन एव जलवायु परिवर्तन, मंत्रालय
Ministry of Environment Forest and Climate Change
एकीकृत क्षेत्रीय कार्यालय, नागपुर-४४०००१
Integrated Regional Office, Nagpur-440001

NOTARIAL REG
ENTRY No. 51155
DATE 21/12/2022

SEAL OF NOTARY
Mrs. KHURANA
NAGPUR
DISTT. (M.S.)
REG. No. 6386
GOVT. OF INDIA

SWORN BEFORE ME ON THIS 2nd
DAY OF Dec 20 22 AT NAGPUR BY
SHRI / SMT./ Ku. E. Thirunavukkarasu
R/o NAGPUR WHO HAS BEEN IDENTIFIED BY
SHRI / SMT. Arundhati
ADVOCATE, NAGPUR.

NOTARY
GOVT. OF INDIA
Nagpur (M.S.) INDIA

NOTARY
CHANCHAL KHURANA
Nagpur Dist.
(M.S.) INDIA
Regd. No.
6386
GOVT. OF INDIA

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[Published in the Gazette of India, Part-II, Section-3, Sub-section (i)]
Ministry of Environment, Forest and Climate Change

Notification

New Delhi, the 18th March, 2016

G.S.R 320(E).— Whereas the Plastic Waste (Management and Handling) Rules, 2011 published vide notification number S.O 249 (E), dated 4th February, 2011 by the Government of India in the erstwhile Ministry of Environment and Forests, as amended from time to time, provided a regulatory frame work for management of plastic waste generated in the country;

And whereas, to implement these rules more effectively and to give thrust on plastic waste minimization, source segregation, recycling, involving waste pickers, recyclers and waste processors in collection of plastic waste fraction either from households or any other source of its generation or intermediate material recovery facility and adopt polluter's pay principle for the sustainability of the waste management system, the Central Government reviewed the existing rules;

And whereas, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986),the draft rules, namely, the Plastic Waste Management, Rules, 2015 were published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* number G.S.R. 423(E), dated the 25th May, 2015 in the Gazette of India, inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of a period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

And Whereas copies of the said Gazette were made available to the public on the 25th May, 2015;

And Whereas the objections and suggestions received within the said period from the public in respect of the said draft rules have been duly considered by the Central Government**;**

NOW, Therefore, in exercise of the powers conferred by sections 3,6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the Plastic Waste (Management and Handling) Rules, 2011, except as respects things done or omitted to be done before such supersession, the Central Government hereby makes the following rules, namely:-

1. Short title and commencement.-(1)These rules shall be called the Plastic Waste Management Rules, 2016.

(1) Save as otherwise provided in these rules, they shall come into force on the date of their

publication in the Official Gazette.

2. Application.-(1) These rules shall apply to every waste generator, local body, Gram Panchayat, manufacturer, Importers and producer.

(2) The rule 4 shall not apply to the export oriented units or units in special economic zones, notified by the Central Government, manufacturing their products against an order for export: Provide this exemption shall not apply to units engaged in packaging of gutkha, tobacco and pan masala and also to any surplus or rejects, left over products and the like.

3. Definitions.- In these rules, unless the context otherwise requires.-

(a) **"Act"** means the Environment (Protection) Act, 1986 (29 of 1986);

(b) **"brand owner"** means a person or company who sells any commodity under a registered brand label.

(c) **"carry bags"** mean bags made from plastic material or compostable plastic material, used for the purpose of carrying or dispensing commodities which have a self carrying feature but do not include bags that constitute or form an integral part of the packaging in which goods are sealed prior to use.

(d) **"commodity"** means tangible item that may be bought or sold and includes all marketable goods or wares;

(e) "**compostable plastics**" mean plastic that undergoes degradation by biological processes during composting to yield CO_2, water, inorganic compounds and biomass at a rate consistent with other known compostable materials, excluding conventional petro-based plastics, and does not leave visible, distinguishable or toxic residue;

(f) **"consent"** means the consent to establish and operate from the concerned State Pollution Control Board or Pollution Control Committee granted under the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974), and the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981);

(g) "**disintegration**" means the physical breakdown of a material into very small fragments;

(h) **"extended producer's responsibility "** means the responsibility of a producer for the environmentally sound management of the product until the end of its life;

(i) **"food-stuffs"** mean ready to eat food products, fast food, processed or cooked food in liquid, powder, solid or semi-solid form;

(j) **"facility"** means the premises used for collection, Storage, recycling, processing and disposal of plastic waste;

(k) **"importer"** means a person who imports or intends to import and holds an Importer - Exporter Code number, unless otherwise specifically exempted.

(l) **"institutional waste generator"** means and includes occupier of the institutional buildings such as building occupied by Central Government Departments, State Government Departments, public or private sector companies, hospitals, schools, colleges, universities or other places of education, organisation, academy, hotels, restaurants, malls and shopping complexes;

(m) "**manufacturer"** means and include a person or unit or agency engaged in production of plastic raw material to be used as raw material by the producer.

(n) **"multilayered packaging"** means any material used or to be used for packaging and having at least one layer of plastic as the main ingredients in combination with one or more layers of materials such aspaper, paper board, polymeric materials, metalised layers or aluminium foil, either in the form of a laminate or co-extruded structure;

(o) **"plastic"** means material which contains as an essential ingredient a high polymer such as polyethylene terephthalate, high density polyethylene, Vinyl, low density polyethylene, polypropylene, polystyrene resins, multi-materials like acrylonitrile butadiene styrene, polyphenylene oxide, polycarbonate, Polybutylene terephthalate;

(p) **"plastic sheet"** means Plastic sheet is the sheet made of plastic;

(q) **"plastic waste"**means any plastic discardedafter use or after their intended use is over;

(r) **"prescribed authority"** means the authorities specified in rule 12;

(s) **"producer"** means persons engaged in manufacture or import of carry bags or multilayered packaging or plastic sheets or like, and includes industries or individuals using plastic sheets or like or covers made of plastic sheets or multilayered packaging for packaging or wrapping the commodity;

(i) **"recycling"** means the process of transforming segregated plastic waste into a new product or raw material for producing new products;

(t) **"registration"** means registration with the State Pollution Control Board or Pollution Control Committee concerned, as the case may be;

(u) **"street vendor"** shall have the same meaning as assigned to it in clause (l) of sub-section (1) of Section 2 of the Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 (7 of 2014);

(v) **"local body"** means urban local body with different nomenclature such as municipal corporation, municipality, nagarpalika, nagarnigam, nagarpanchayat, municipal council including notified area committee (NAC) and not limited to or any other local body constituted under the relevant statutes such as gram panchayat, where the management of plastic waste is entrusted to such agency;

(w) **"virgin plastic"** means plastic material which has not been subjected to use earlier and has also not been blended with scrap or waste;

(x) **"waste generator"** means and includes every person or group of persons or institution, residential and commercial establishments including Indian Railways, Airport, Port and Harbour and Defense establishments which generate plastic waste;

(y) **"waste management"** means the collection, storage, transportation reduction, re-use, recovery, recycling, composting or disposal of plastic waste in an environmentally safe manner;

(z) **"waste pickers"** mean individuals or agencies, groups of individuals voluntarily engaged or authorised for picking of recyclable plastic waste.

4. Conditions.- (1) The manufacture,importer stocking, distribution, sale and use of carry bags, plastic sheets or like, or cover made of plastic sheet and multilayered packaging, shall be subject to the following conditions, namely:-

a) carry bags and plastic packaging shall either be in natural shade which is without any added pigments or made using only those pigments and colourants which are in conformity with Indian Standard : IS 9833:1981 titled as "List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water", as amended from time to time;

b) Carry bags made of recycled plastic or products made of recycled plastic shall not be used for storing, carrying, dispensing or packaging ready to eat or drink food stuff';

c) carry bag made of virgin or recycled plastic, shall not be less than fifty microns in thickness;

d) plastic sheet or like, which is not an integral part of multilayered packaging and cover made of plastic sheet used for packaging, wrapping the commodity shall not be less than fifty microns in thickness except where the thickness of such plastic sheets

impair the functionality of the product;

e) the manufacturer shall not sell or provide or arrange plastic to be used as raw material to a producer, not having valid registration from the concerned State Pollution Control Boards or Pollution Control Committee;

f) sachets using plastic material shall not be used for storing, packing or selling gutkha, tobacco and pan masala;

g) recycling of plastic waste shall conform to the Indian Standard: IS 14534:1998 titled as Guidelines for Recycling of Plastics, as amended from time to time;

h) The provision of thickness shall not be applicable to carry bags made up of compostable plastic. Carry bags made from compostable plastics shall conform to the Indian Standard: IS 17088:2008 titled as Specifications for Compostable Plastics, as amended from time to time. The manufacturers or seller of compostable plastic carry bags shall obtain a certificate from the Central Pollution Control Board before marketing or selling; and

i) plastic material, in any form including Vinyl Acetate - Maleic Acid - Vinyl Chloride Copolymer, shall not be used in any package for packaging gutkha, pan masala and tobacco in all forms.

5. Plastic waste management.- (1) The plastic waste management by the urban local bodies in their respective jurisdiction shall be as under:-

(a) plastic waste, which can be recycled, shall be channelized to registered plastic waste recycler and recycling of plastic shall conform to the Indian Standard: IS 14534:1998 titled as Guidelines for Recycling of Plastics, as amended from time to time.

(b) local bodies shall encourage the use of plastic waste (preferably the plastic waste which cannot be further recycled) for road construction as per Indian Road Congress guidelines or energy recovery or waste to oil etc. The standards and pollution control norms specified by the prescribed authority for these technologies shall be complied with.

(c) Thermo set plastic waste shall be processed and disposed off as per the guidelines issued from time to time by the Central Pollution Control Board.

(d) The inert from recycling or processing facilities of plastic waste shall be disposed of in compliance with the Solid Waste Management Rules, 2000 or as amended from time to time.

6. Responsibility of local body.- (1) Every local body shall be responsible for development and setting up of infrastructure for segregation, collection, storage, transportation, processing and disposal of the plastic waste either on its own or by engaging agencies or producers.

(2) The local body shall be responsible for setting up, operationalisation and co-ordination of the waste management system and for performing the associated functions, namely:-

(a) Ensuring segregation, collection, storage, transportation, processing and disposal of plastic waste;
(b) ensuring that no damage is caused to the environment during this process;
(c) ensuring channelization of recyclable plastic waste fraction to recyclers;
(d) ensuring processing and disposal on non-recyclable fraction of plastic waste in accordance with the guidelines issued by the Central Pollution Control Board;
(e) creating awareness among all stakeholders about their responsibilities;
(f) engaging civil societies or groups working with waste pickers; and
(g) ensuring that open burning of plastic waste does not take place.

(3) The local body for setting up of system for plastic waste management shall seek assistance of producers and such system shall be set up within one year from the date of final publication of these rules in the Official Gazaette of India.

(4) The local body to frame bye-laws incorporating the provisions of these rules.

7. Responsibility of Gram Panchayat.- (1) Every gram panchayat either on its own or by engaging an agency shall set up, operationalise and co-ordinate for waste management in the rural area under their control and for performing the associated functions, namely,-

(a) ensuring segregation, collection, storage, transportation, plastic waste and channelization of recyclable plastic waste fraction to recyclers having valid registration; ensuring that no damage is caused to the environment during this process;
(b) creating awareness among all stakeholders about their responsibilities; and
(c) ensuring that open burning of plastic waste does not take place

8. Responsibility of waste generator.- (1) The waste generator shall.-

(a) take steps to minimize generation of plastic waste and segregate plastic waste at source in accordance with the Solid Waste Management Rules, 2000 or as amended from time to time.

(b) not litter the plastic waste and ensure segregated storage of waste at source and handover segregated waste to urban local body or gram panchayat or agencies

appointed by them or registered waste pickers', registered recyclers or waste collection agencies;

(2) All institutional generators of plastic waste, shall segregate and store the waste generated by them in accordance with the Municipal Solid Waste (Management and Handling) Rules, 2000 notified vide S.O 908(E) dated the 25th September, 2000 under the Act or amendment from time to time and handover segregated wastes to authorized waste processing or disposal facilities or deposition centers either on its own or through the authorized waste collection agency.

(3) All waste generators shall pay such user fee or charge as may be specified in the bye-laws of the local bodies for plastic waste management such as waste collection or operation of the facility thereof, etc.;

(4) Every person responsible for organising an event in open space, which involves service of food stuff in plastic or multilayered packaging shall segregate and manage the waste generated during such events in accordance with the Municipal Solid Waste (Management and Handling) Rules, 2000 notified vide S.O 908(E) dated the 25th September, 2000 under the Act or amendment from time to time.

9. Responsibility of producers, **Importers and Brand Owners.-** (1) The producers, within a period of six months from the date of publication of these rules, shall work out modalities for waste collection system based on Extended Producers Responsibility and involving State Urban Development Departments, either individually or collectively, through their own distribution channel or through the local body concerned.

(2) Primary responsibility for collection of used multi-layered plastic sachet or pouches or packaging is of Producers, Importers and Brand Owners who introduce the products in the market. They need to establish a system for collecting back the plastic waste generated due to their products. This plan of collection to be submitted to the State Pollution Control Boards while applying for Consent to Establish or Operate or Renewal. The Brand Owners whose consent has been renewed before the notification of these rules shall submit such plan within one year from the date of notification of these rules and implement with two years thereafter.

(3) manufacture and use of non- recyclable multilayered plastic if any should be phased out in Two years time.

(4) The producer, within a period of three months from the date of final publication of these rules in the Official Gazette shall apply to the Pollution Control Board or the Pollution Control Committee, as the case may be, of the States or the Union Territories administration concerned, for grant of registration.

(5) No producer shall on and after the expiry of a period of Six Months from the date of final publication of these rules in the Official Gazette manufacture or use any plastic or

multilayered packaging for packaging of commodities without registration from the concerned State Pollution Control Board or the Pollution Control Committees.

(6) Every producer shall maintain a record of details of the person engaged in supply of plastic used as raw material to manufacture carry bags or plastic sheet or like or cover made of plastic sheet or multilayered packaging.

10. Protocols for compostable plastic materials.-Determination of the degree of degradability and degree of disintegration of plastic material shall be as per the protocols of the Indian Standards listed in Schedule-I to these rules.

11. Marking or labelling.-(1) Each plastic carry bag and multilayered packaging shall have the following information printed in English namely,-

(a) name, registration number of the manufacturer and thickness in case of carry bag;
(b) name and registration number of the manufacturer in case of multilayered packaging; and
(c) name and certificate number [Rule 4(h)] in case of carry bags made from compostable plastic

(2) Each recycled carry bag shall bear a label or a mark "recycled" as shown below and shall conform to the Indian Standard: IS 14534: 1998 titled as "Guidelines for Recycling of Plastics", as amended from time to time;

NOTE: PET-Polyethylene terephthalate, HDPE-High density polyethylene, V-Vinyl (PVC), LDPE- Low density polyethylene, PP-Polypropylene, PS-Polystyrene and Other means all other resins and multi-materials like ABS (Acrylonitrile butadiene styrene), PPO (Polyphenylene oxide), PC (Polycarbonate), PBT (Polybutylene terephalate) etc.

Each carry bag made from compostable plastics shall bear a label "compostable" and shall conform to the Indian Standard : IS or ISO 17088:2008 titled as Specifications for "Compostable Plastics".

12. Prescribed authority.- (1) The State Pollution Control Board and Pollution Control Committee in respect of a Union territory shall be the authority for enforcement of the

provisions of these rules relating to registration, manufacture of plastic products and multilayered packaging, processing and disposal of plastic wastes.

(2) The concerned Secretary-in-charge of Urban Development of the State or a Union Territory shall be the authority for enforcement of the provisions of these rules relating to waste management by waste generator, use of plastic carry bags, plastic sheets or like, covers made of plastic sheets and multilayered packaging.

(3) The concerned Gram Panchayat shall be the authority for enforcement of the provisions of these rules relating to waste management by the waste generator, use of plastic carry bags, plastic sheets or like, covers made of plastic sheets and multilayered packaging in the rural area of the State or a Union Territory.

(4) The authorities referred to in sub-rules (1) to (3) shall take the assistance of the District Magistrate or the Deputy Commissioner within the territorial limits of the jurisdiction of the concerned district in the enforcement of the provisions of these rules.

13. Registration of producer, recyclers and manufacturer,- (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.

(5) The State Pollution Control Board or the Pollution Control Committee shall not issue or renew registration to plastic waste recycling or processing units unless the unit possesses a valid consent under the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) along with a certificate of registration issued by the District Industries Centre or any other Government agency authorised in this regard.

(6) The State Pollution Control Board or the Pollution Control Committee shall not renew registration of producer unless the producer possesses and action plan endorsed by the Secretary in charge of Urban Development of the concerned State or Union Territory for setting of plastic waste management system.

(7) On receipt of the application complete in all respects for the registration for recycling or processing of plastic waste under sub-rule (3), the State Pollution Control Board may, after such inquiry as it considers necessary and on being satisfied that the applicant possesses appropriate facilities, technical capabilities and equipment to handle plastic waste safely, may grant registration to the applicant on fulfilment of the conditions as may be laid down in terms of registration.

(8) Every State Pollution Control Board or Pollution Control Committee shall take a decision on the grant of registration within ninety days of receipt of an application which is complete in all respects.

(9) The registration granted under this rule shall initially be valid for a period of one year, unless revoked, suspended or cancelled and shall subsequently be granted for three years.

(10) State Pollution Control Board or the Pollution Control Committees shall not revoke, suspend or cancel registration without providing the opportunity of a hearing to the producer or person engaged in recycling or processing of plastic wastes.

(11) Every application for renewal of registration shall be made at least one hundred twenty days before the expiry of the validity of the registration certificate.

14. Responsibility of retailers and street vendors- (1) Retailers or street vendors shall not sell or provide commodities to consumer in carry bags or plastic sheet or multilayered packaging, which are not manufactured and labelled or marked, as per prescribed under these rules.

(2) Every retailers or street vendors selling or providing commodities in, plastic carry bags or multilayered packaging or plastic sheets or like or covers made of plastic sheets which are not manufactured or labelled or marked in accordance with these rules shall be liable to pay such fines as specified under the bye-laws of the local bodies.

15. Explicit pricing of carry bags.- (1) The shopkeepers and street vendors willing to provide plastic carry bags for dispensing any commodity shall register with local body. The local body shall, within a period of six months from the date of final publication of these rules ion the Official Gazette of India notification of these rules, by notification or an order under their appropriate state statute or byelaws shall make provisions for such registration on payment of plastic waste management fee of minimum rupees forty eight thousand @ rupees four thousand per month. The concerned local body may prescribe higher plastic waste

management fee, depending upon the sale capacity. The registered shop keepers shall display at prominent place that plastic carry bags are given on payment.

(2) Only the registered shopkeepers or street vendors shall be eligible to provide plastic carry bags for dispensing the commodities.

(3) The local body shall utilize the amount paid by the customers for the carry bags exclusively for the sustainability of the waste management system within their jurisdictions.

16. State Level Monitoring Committee.- (1) The State government or the union Territory shall, for the purpose of effective monitoring of implementation of these rules, constitute a State Level Advisory Committee consisting of the following persons, namely;-

(a)	the Secretary, Department of Urban Development	- Chairman
(b)	Director from State Department of Environment	- Member
(c)	Member Secretary from State Pollution Control Board or Pollution Control Committee	- Member
(d)	Municipal Commissioner	- Member
(e)	one expert from Local Body	- Member
(f)	one expert from Non-Governmental involved in Waste Management	- Member
(g)	Commissioner, Value Added Tax or his nominee, Member	-
(h)	Sales Tax Commissioner or Officer	- Member
(i)	representative of Plastic Association, Drug Manufacturers Association, Chemical Manufacturers Association	- Member
(j)	one expert from the field of Industry	- Member and
(k)	one expert from the field of academic institution	- Member
(l)	Director , Municipal Administration- Convener	

The State Level Advisory Body shall meet at least once in Six Month and may invite experts, if it considers necessary.

17. Annual reports.- (1) Every person engaged in recycling or processing of plastic waste shall prepare and submit an annual report in Form-IV to the local body concerned under intimation to the concerned State Pollution Control Board or Pollution Control Committee by the 30th April, of every year.

(2) Every local body shall prepare and submit an annual report in Form –V to the concerned Secretary-in-charge of the Urban Development Department under intimation to the concerned State Pollution Control Board or Pollution Control Committee by the 30th June, everyyear.

(3) Each State Pollution Control Board or Pollution Control Committee shall prepare and submit an annual report in Form VI to the CPCB on the implementation of these rules by the 31st July, of every year.

(4) The CPCB shall prepare a consolidated annual report on the use and management of plastic waste and forward it to the Central Government along with its recommendations before the 31st August of every year.

Schedule-I

[See rule 10]

1.	IS / ISO 14851: 1999 Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium-Method by measuring the oxygen demand in a closed Respirometer
2.	IS / ISO 14852: 1999 Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium-Method by analysis of evolved carbon dioxide
3.	IS / ISO 14853: 2005 Plastics- Determination of the ultimate anaerobic biodegradation of plastic materials in an aqueous system-Method by measurement of biogas production
4.	IS /ISO 14855-1: 2005 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions-Method by analysis of evolved carbon dioxide (Part-1 General method)
5.	IS / ISO 14855-2: 2007 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions-Method by analysis of evolved carbon dioxide (Part-2: Gravimetric measurement of carbon dioxide evolved in a laboratory- scale test)
6.	IS / ISO 15985: 2004 Plastics- Determination of the ultimate anaerobic biodegradation and disintegration under high-solids anaerobic digestion conditions- Methods by analysis of released biogas
7.	IS /ISO 16929: 2002 Plastics- Determination of degree of disintegration of plastic materials under defined composting conditions in a pilot - scale test
8.	IS / ISO 17556: 2003 Plastics- Determination of ultimate aerobic biodegradability in soil by measuring the oxygen demand in a Respirometer or the amount of carbon dioxide evolved
9.	IS / ISO 20200:2004 Plastics- Determination of degree of disintegration of plastic materials under simulated composting conditions in a laboratory - scale test

FORM - I

[See rules 13 (2)]

APPLICATION FOR REGISTRATION FOR PRODUCERS or Brand Owners

From: .....

……

…….(Name and full address of the occupier)

To

The Member Secretary,

.....…… Pollution Control Board or Pollution Control Committee

…….

…….

Sir,

I /We hereby apply for registration under rule 9 of the Plastic Waste Management Rules, 2015

1. Producers

PART – A GENERAL		
1.(a)	Name and location of the unit	
(b)	Address of the unit	
(c)	Registration required for manufacturing of: (i) Carry bags; (a) petro- based, (b) Compostable (ii) Multilayered plastics	
(d)	Manufacturing capacity	
(e)	In case of renewal, previous registration number and date of registration	
2.	Is the unit registered with the District Industries Centre of the State Government or Union territory? If yes, attach a copy.	
3.(a)	Total capital invested on the project	
(b)	Year of commencement of production	
4. (a)	List and quantum of products and by-products	
(b)	List and quantum of raw materials used	
5.	Furnish a flow diagram of manufacturing process showing input and output in terms of products and waste generated including for captive power	

	generation and water.	
6.	Status of compliance with these rules- Thickness – fifty micron (Yes/No)	
	PART – B PERTAINING TO LIQUID EFFLUENT AND GASEOUS EMISSIONS	
7.	(a) Does the unit have a valid consent under the Water (Prevention and control of Pollution) Act, 1974 (6 of 1974)? If yes, attach a copy	
	(b) Does the unit have a valid consent under the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981)? If yes, attach a copy	
	PART – C PERTAINING TO WASTE	
8.	Solid Wastes or rejects: (a) Total quantum of waste generated (b) Mode of storage within the plant (c) Provision made for disposal of wastes	
9.	Attach or Provide list of person supplying plastic to be used as raw material to manufacture carry bags or plastic sheet of like or multilayered packaging	
10.	Attach or provide list of personnel or brand Owners to whom the products will be supplied	
11.	Action plan on collecting back the plastic wastes	
	Name and Signature Designation Date : Place :	

II Brand Owners:

	PART – A GENERAL	
1.	Name, address and Contact number	
2	In case of renewal, previous registration number and date of registration	
3	Is the unit registered with the District Industries Centre of the State Government or Union	

	territory? If yes, attach a copy.	
4.(a)	Total capital invested on the project	
(b)	Year of commencement of production	
5. (a)	List and quantum of products and by-products	
(b)	List and quantum of raw materials used	
PART – B PERTAINING TO LIQUID EFFLUENT AND GASEOUS EMISSIONS		
5	Does the unit have a valid consent under the Water (Prevention and control of Pollution) Act, 1974 (6 of 1974)? If yes, attach a copy	
6	Does the unit have a valid consent under the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981)? If yes, attach a copy	
PART – C PERTAINING TO WASTE		
7.	Solid Wastes or rejects: (c) Total quantum of waste generated (d) Mode of storage within the plant (d) Provision made for disposal of wastes	
8.	Attach or Provide list of person supplying plastic material	
9	Action plan on collecting back the plastic wastes	

Name and Signature

Designation

Date :

Place :

FORM - II

[see rule 13 (3)]

APPLICATION FORM FOR REGISTRATION OF UNITS ENGAGED IN PROCESSING OR RECYCLING OF PLASTIC WASTE

1.	Name and Address of the unit				
2.	Contact person with designation, Tel./Fax /email				
3.	Date of commencement				
4.	No. of workers (including contract labour)				
5.	Consents Validity	a. Water (Prevention & Control of Pollution) Act, 1974; Valid up to _____ b. Air (Prevention & Control of Pollution) Act, 1981; Valid up to_____ c. Authorization ; valid up to ….			
6.	Manufacturing Process	Please attach a flow diagram of the manufacturing process flow diagram for each product.			
7.	Products and installed capacity of production (MTA)	Products		Installed capacity	
8.	Waste Management:	S No	Type	Category	Qty.
	a. Waste generation in processing plastic-waste	(i)			
		(ii)			
		(iii)			
	b. Waste Collection and transportation (attach details)				
	c. Waste Disposal details	S No	Type	Category	Qty
		(i)			

		(ii)			
	d. Provide details of the disposal facility, whether the facility is authorized by SPCB or PCC				
	e. Please attach analysis report of characterization of waste generated (including leachate test if applicable)				
9.	Details of plastic waste proposed to be acquired through sale, auction, contract or import, as the case may be, for use as raw material	(i) Name (ii) Quantity required /year			
10.	Occupational safety and health aspects	Please provide details of facilities			
11.	Pollution Control Measures				
	Whether the unit has adequate pollution control systems or equipment to meet the standards of emission or effluent.	If Yes, please furnish details			
	Whether unit is in compliance with conditions laid down in the said rules.	Yes/No			
	Whether conditions exist or are likely to exist of the material being handled or processed posing adverse immediate or delayed impacts on the environment.	Yes/No			
	Whether conditions exist (or are likely to exist) of the material being handled or processed by any means capable of yielding another material (e.g. leachate) which may possess eco-toxicity.	Yes/No			
12.	Any other relevant information including fire or accident mitigative measures				
13.	List of enclosures as per rule				

Name and Signature

Designation

Date :
Place :

FORM - III

[See rules 13(4)]

APPLICATION FOR REGISTRATION FOR MANUFACTURERS of plastic raw materials

From: .....

……

…….(Name and full address of the occupier)

To

The Member Secretary,

.....…… Pollution Control Board or Pollution Control Committee

…….

…….

Sir,

I/We hereby apply for registration under the Plastic Waste Management Rules, 2011

PART – A GENERAL		
1.(a)	Name and location of the unit	
(b)	Address of the unit	
(c)	In case of renewal, previous registration number and date of registration	
2.	Is the unit registered with the DIC or DCSSI of the State Government or Union territory? If yes, attach a copy.	
3.(a)	Total capital invested on the project	
(b)	Year of commencement of production	
(c)	List of producers and quantum of raw materials supplied to producers	
		Name and Signature Designation
Date : Place :		

Form - IV

[See rules 17 (1)]

Format of Annual Report by Operator of plastic waste processing or recycling Facility to the Local Body

Period of Reporting:

(1)	Name and Address of operator of the facility	
(2)	Name of officer in-charge of the facility (Telephone/Fax/Mobile/ E-mail)	
(3)	Capacity:	
(4)	Technologies used for management of plastic waste:	
(5)	Quantity of plastic waste received during the year being reported upon along with the source	
(6)	Quantity of plastic waste processed (in tons): - Plastic waste recycled(in tons) - Plastic waste processed (in tons) - Used (in tons)	
(7)	Quantity of inert or rejects sent for final disposal to landfill sites:	
(8)	Details of land fill facility to which inert or rejects were sent for final disposal: - Address -Telephone	
(9)	Attach status of compliance to environmental conditions, if any specified during grant of Consent or registration	

Signature of Operator

Dated :
Place:

Form - V

[See rules 17(2)]

FORMAT FOR ANNUAL REPORT ON PLASTIC WASTE MANAGEMENT TO BE SUBMITTED BY THE LOCAL BODY

Period of Reporting:

(1)	Name of the City or Town and State:	
(2)	Population	
(3)	Area in sq. kilometers	
(4)	Name & Address of Local body Telephone No. Fax No. E-mail:	
(5)	Total Numbers of the wards in the area under jurisdiction	
(6)	Total Numbers of Households in the area under jurisdiction	
(7)	Number of households covered by door to door collection	
(8)	Total number of commercial establishments and Institutions in the area under jurisdiction -Commercial establishments - Institutions	
(9)	Number of commercial establishments and Institutions covered by door to door collection -Commercial establishments - Institutions	
(10)	Summary of the mechanisms put in place for management of plastic waste in the area under jurisdiction along with the details of agencies involved in door to door collection	
(11)	Attach details of infrastructure put in place for management of plastic waste generated in the area under jurisdiction	
(12)	Attach details of infrastructure required, if any along with justification	
(13)	Quantity of Plastic Waste generated during the year from area under jurisdiction (in tons)	
(14)	Quantity of Plastic Waste collected during the year from area under jurisdiction (in tons)	
(15)	Quantity of plastic waste channelized for recycling during the year (in tons)	

(16)	Quantity of plastic waste channelized for use during the year (in tons)	
(17)	Quantity of inert or rejects sent to landfill sites during the year (in tons)	
(18)	Details of each of facilities used for processing and disposal of plastic waste **Facility-I** i) Name of operator ii) Address with Telephone Number or Mobile iii) Capacity iv) Technology Used v) Registration Number vi) Validity of Registration (up to) **Facility-II** i) Name of operator ii) Address with Telephone Number or Mobile iii) Capacity iv) Technology Used v) Registration Number Validity of Registration (up to)	
(19)	Give details of: Local body's own manpower deployed for collection including street sweeping, secondary storage, transportation, processing and disposal of waste.	
(20)	Give details of: Contractor or concessionaire's manpower deployed for collection including street sweeping, secondary storage, transportation, processing and disposal of waste.	
(21)	Mention briefly, the difficulties being experienced by the local body in complying with provisions of these rules including the financial constrains, if any	
(22)	Whether an Action Plan has been prepared for improving solid waste management practices in the city? If yes (attach copy) Date of revision:	

Signature of CEO or Municipal Commissioner or
Executive Officer or Chief Officer

Date:
Place:

Form-VI

STATE-WISE STATUS OF IMPLEMENTATION OF PLASTIC WASTE MANAGEMENT RULES, 2016 FOR THE YEAR … ANNUAL REPORT Format

Name of the SPCB or PCC	Estimated Plastic Waste generation Tons Per Annum (TPA)	No. Of registered Plastic Manufacturing or Recycling (including multilayer, compostable) units. (Rule 9)			No. of Unregistered plastic manufacturing Recycling units. (in residential or unapproved areas)	Details of Plastic Waste Management (PWM) e.g. Collection, Segregation, Disposal (Co-processing road construction etc.) (Rules 6) (Attach separate sheet)	Partial or complete ban on usages of Plastic Carry Bags (through Executive Order) (Attach copy of notification or executive order)	Status of Marking Labelling on carry bags (Rule 8) [Specify the number of units or not complied)complied	Explicit Pricing of carry bags (Rule 10)	Details of the meeting of State Level Advisory Body (SLA) along with its recommendations on Implementation (Rule 11)	No. of violations and action taken on non-compliance of provisions of these Rules	Number of Municipal Authority or Gram Panchayatunder jurisdiction and Submission of Annual Report to CPCB (Rule 12)
		Plastic units	Compostable Plastic Units	Multilayer Plastic units								
(1)	(2)	(3)			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

[F.No. 17-2/2001-HSMD]

Bishwanath Sinha
Joint Secretary to Government of India

Annexure R2

Report on Single Use Plastics

Department of Chemicals and Petrochemicals
Ministry of Chemicals and Fertilizers
Govt. of India

डी वी सदानंद गौड़ा
D V Sadananda Gowda
ಡಿ.ವಿ. ಸದಾನಂದ ಗೌಡ

Minister of Chemicals & Fertilizers
GOVERNMENT OF INDIA

MESSAGE

It has been more than 100 years since plastics have befriended human race. Plastics have unlimited applications in different fields like automobile, packaging, construction, healthcare, coatings, adhesives and many more. They have been nurturing technological advancements to make life much easier. As it is widely known, one of the major use of plastics is in the packaging sector wherein they are used in different forms – carry bags, tetra-packs, multi-layered packaging, thermo & vacuum formed products, foamed packaging, blister packaging and so on. Their penetration into the sustenance sector has allowed easy packaging, storage and transportation of various food & beverage items, while contributing significantly to Indian economy. Also, plastics have been backing the technological advancements by allowing miniaturization of products and maximization of production in electrical & electronics, healthcare, construction and defence sectors.

However, the increased use of plastics and its unorganized disposal have been creating various ecological issues like polluting the environment and threatening the land and marine ecosystems. During the Independence day speech, Hon'ble Prime Minister Shri Narendra Modiji has expressed serious concern over the use of single-use plastics. This global concern is being addressed with much thoughtfulness by many countries across the globe, who have reframed their policies to curb littering and to utilize the littered plastics vigilantly. It was a judicious move by the Government to form a committee comprising of experts in the relevant area to study the current scenario and suggest technically and commercially feasible solutions to define 'Single Use Plastics' in the country.

I am extremely happy that the committee, consisting of strategists, scientific experts and officers of my Ministry, has undertaken a thorough survey and has put forward tangible routes to effectively utilize end-of-life plastics, predominantly 'Single Use Plastics'. The committee has also put forth their continuous efforts of several months to contribute significantly on the said issue, for the healthy growth of the Nation. This report reveals the categorisation of single use plastic products and provides deep in-sight into the prospective end-of-life solutions for them.

I appreciate all the committee members for their untiring efforts and aspiration to address the ecological concern.

(D.V. Sadananda Gowda)

September, 2019

Office : Room No. 318-A, Shastri Bhawan, Dr. Rajendra Prasad Road, New Delhi - 110 001 - Tel. +91-11-23386559, 23386519 - Fax: +91-11-23384020
Residence: No. 1, Tyagraj Marg, New Delhi - 110 011 - Tel. : +91-11-23014399, 23014299 - Fax : +91-11-23012399
Bengaluru Office : V.V. Tower, 1st Floor, Dr. B.R. Ambedkar Road, Bengaluru-560 001
Tel. : +91-80-22866607, 22866600 - Fax: +91-80-22866698
e-mail : dvsbangalorenorth@gmail.com, dvsg.mcf@gov.in

राज्य मंत्री
पोत परिवहन (स्वतंत्र प्रभार),
रसायन एवं उर्वरक
भारत सरकार

Minister of State
Shipping (Independent Charge),
Chemicals and Fertilizers
Government of India

मनसुख मांडविया
MANSUKH MANDAVIYA

26th September, 2019

MESSAGE

Plastics, classified as the most versatile materials, have a cluster of applications, ranging from domestic to industrial. They have made our lives so comfortable that it has become impossible to imagine a life without them. They have captured all niche markets because of their suitability for diverse applications and innate properties they possess – low density, easy processability, mouldability to intricate shapes & structures, corrosion resistance and most importantly, sustainability. The use of plastics has increased exponentially in short lived applications (packaging, cutleries, banners etc.) due to the cost-effectiveness and convenience they offer, over the conventional materials. However, the disposed plastics, after one or a few uses, have been causing serious menace to the environment.

The Expert Committee constituted to study the issue, has brought out many effective calculations for investigating the utility of plastic materials and their detrimental effects, under certain circumstances, on the ecosystem. This has helped in categorizing the most trouble-some products made of plastics, those that are littered in large scale by end-users and manufacturers. The experts of the Committee have worked effectively in analysing the current scenario and policies, to articulate an insightful report on the pros and cons to define 'Single Use Plastics' in the country.

I am happy to note that the effectual methodologies pointed out in the report, would aid the industries, manufacturers and recyclers to formulate appropriate end-of-life solutions for respective products, thereby reducing their accumulation in the environment. This would further increase the value of such materials and would create awareness for promoting organized disposal systems. Moreover, I am sure that development of new alternative materials like compostable plastics and oxo-biodegradable plastics are also a potential solution to address the above issue.

This report is a comprehensive document, distinguishing potentially undesirable plastic products from those which are beneficial. I sincerely hope that the report would be a ready reference for understanding the utility and adverse effects of various plastic products.

(Mansukh Mandaviya)

Room No. 201, Transport Bhavan, New Delhi - 110001 Tel : 011-23717422, 23717423, 23717424, Fax : 011-23714653

पी. राघवेन्द्र राव
सचिव
P. RAGHAVENDRA RAO
Secretary

भारत सरकार
रसायन और उर्वरक मंत्रालय
रसायन और पेट्रोरसायन विभाग
कक्ष संख्या 501, 'ए' विंग, शास्त्री भवन
डॉ राजेन्द्र प्रसाद रोड, नई दिल्ली – 110 001
Government of India
Ministry of Chemicals & Fertilizers
Department of Chemicals & Petrochemicals
Room No. 501, 'A' Wing, Shastri Bhavan
Dr. Rajendra Prasad Road, New Delhi - 110 001
Tel.: 23384106/ 23382467/Fax : 23387693
E-mail : sec.cpc@nic.in

एक कदम स्वच्छता की ओर

MESSAGE

Plastics, the most resourceful class of materials humankind has ever known, have boundless applications in this modern world. They are an integral part of lightweight auto/aero and structural components, packaging of perishable and non-perishable items, agro-products, diagnostic and therapeutic tools, electrical equipment parts for insulation and EMI shielding, customized coatings for varied applications, portable power and energy devices etc. Amongst the above, Agriculture and Food Packaging sectors have been the key growth drivers of plastics globally, with packaging sector having a share of 24% in total domestic consumption closely followed by agriculture sector (23%). This increased use of plastics has, in fact, led to accumulation of waste plastics disposed after minimal usage, leading to a critical universal issue. Majority of the countries across the globe have been striving towards eliminating the menace through stringent policies for pre and post-consumer use of plastics. India, being an emerging economy, is witnessing a similar situation, which has compelled the policy makers to develop an eco-friendly regime.

In the wake of such scenario, there has been a conscious attempt to elude a few hostile products, majorly made of plastics, from the niche markets. For better awareness of the issues relating to management of Plastic waste in an environmentally sound manner as well as the problems faced by the MSMEs for particular category of plastic ban, an Expert Committee was formed with a mandate to identify 'Single Use Plastics' in the country. The Expert Committee studied the matter in detail taking views and opinions from different stakeholders and devised approaches to assess the utility and adverse impacts of the single use plastic products.

Another highlight of this report is the detailed description on possible end-of-life solutions for plastic products. Routes such as recycling the waste plastic components into value added products, energy recovery, feedstock recycling etc. have been described in detail. This report reminds that the root-cause of the concern is our own littering habit and not the material itself.

On behalf of the Department of Chemicals & Petrochemicals, Govt. of India, I would like to thank the Chairman of Expert Committee and all the Members, for their efforts and desire towards creating a cleaner and responsible India.

P. Raghavendra Rao

(P. Raghavendra Rao)

Shri Indrajit Pal, IAS (Retd.)
Former Secretary (C&PC), GoI

PREFACE

As members of the Expert Committee on 'Single Use Plastics', constituted by the Department of Chemicals and Petrochemicals (DCPC), Government of India, we had rather a difficult task. Plastics, the wonder materials of the twentieth century, have gradually come to be regarded as an environmental disaster. Ironically, this perception arises largely on account of the very properties that have made plastics useful and ubiquitous. 'Single Use Plastics', which includes practically all plastic packaging, attract the greatest environmental concern. Nonetheless, at least at the current level of technology, plastics, even single use plastics, continue to be important for the country's economy and employment. This conflict also reflects in the legal-regulatory framework.

The Report of the Committee is guided by the Terms of Reference given to us. We have recommended that the existing legal – regulatory framework be implemented rigorously. To this end, we have recommended that certain neglected elements of the post-consumer value chain, which are well recognised in the law, be supported and developed. We have devised an index for categorising 'Single Use Plastics'. We believe that this index will be useful for deciding the appropriate policy actions. We recommend strong indigenous research efforts in technology and design, both to reduce the use of 'Single Use Plastics', and to deal better with the post-consumer waste.

We are grateful to the DCPC for having given us the opportunity to work in a public cause. We thank the representatives of industry associations, non-governmental organisations, activists, government officials and experts who have contributed their time and knowledge. We acknowledge the authors and owners of the several reports and documents that are referred to in this Report. We thank the officials concerned of DCPC for the assistance provided to us. We acknowledge specially the hard work put in by CIPET Team, who provided the research and documentation support, and discharged the task of converting ideas into meaningful text.

Indrajit Pal
19/9/19

New Delhi
September 19, 2019

Chairman of the Expert Committee

CONTENTS

EXECUTIVE SUMMARY

1. The present legal and regulatory framework for managing plastics waste, consists of the Environment (Protection) Act, 1986, the Plastic Waste Management Rules, 2016 (amended in 2018), and certain State laws. The Committee has examined these Rules and is of the view that these are adequate.

2. The Committee examined the bans and other restrictions on plastic products issued by various State Governments and Union territories. The Committee noted that the guidelines lack uniformity and vary widely in different parts of the country.

3. For the purpose of this Report, the Committee has considered the definitions of 'Single Use Plastics' (SUP) as given by the United Nations Environment Programme (UNEP) and by several countries. The Committee is of the view that the 'guidelines' issued by Ministry of Environment, Forests and Climate Change (MoEF & CC) as under, may be adopted as the definition. It needs be noted that the term 'Single Use Plastics' refers to certain products made wholly or partly of plastics, but not to any 'polymer' or 'resin'.

   "Single-use plastics, often also referred to as disposable plastics (use-and-throw items), are commonly used for plastic packaging and include items intended to be used only once before they are thrown away or recycled. These include, among other items, carry bags, food packaging, bottles, straws, containers, cups and cutlery".

4. The Committee noted that two important features of the PWM Rules (2016 / 2018), namely the responsibility of the local bodies in managing plastic waste, and the responsibility of producers / importers / brand owners / Extended Producers Responsibility (EPR), have not been fulfilled.

5. The Committee has categorised 'Single Use Plastics' based on certain criteria, following a logical and scientific process, on the basis of its utility, economic value and adverse impact on the environment. Figure 1 in the main Report provides a graphical representation of the categorization. The list of products considered is representative, and any other or new product can be analysed similarly.

6. The Committee noted that the utility and economic value of 'Single Use Plastics' is not confined to the plastic manufacturing / processing sector alone. The entire manufacturing and service sectors (agriculture, public health and hygiene, medical, food service etc.) are critically dependent on 'Single Use Plastics'. Any policy decision on 'Single Use Plastics' should be taken with caution since it is likely to impact a large part of the country's Gross Domestic Product (GDP), employment and the modern lifestyle.

7. The Committee studied various 'End of Life' (EoL) solutions for various 'Single Use Plastic' products, and noted that solutions like 'Alternate Use' and 'Energy Recovery' are yet to be matured in India.

8. The Committee noted that the present system of recycling of 'Single Use Plastics' products is predominantly in the unorganised sector. To a large extent, the work practices in this sector (handling, segregation and processing) are poor and the recycled products are not of adequate quality. The recycling industry is largely non-compliant with safety, health and environment (SHE) norms.

9. The Committee noted that the present system of collection, segregation and disposal of Single Use Plastic waste is dependent on informal waste pickers (colloquially called 'rag pickers'). This is an extremely vulnerable group that has not received any support yet.

10. The Committee recognizes that the informal waste picking profession is not a preferred career choice and may decline over time as incomes and education levels increase. There exist countries that have no waste pickers, yet have excellent systems for managing plastics waste.

11. 'Compostable', 'Oxo-degradable' and 'Oxo-biodegradable' plastics are lately being introduced and promoted as environment friendly options, to reduce the problem of plastic waste. The main Report contains a discussion on these products.

12. The Committee has considered the views and opinions of various stakeholders (Industry, Industry Associations, Non-Governmental Organizations and Government Departments), while preparing the Report.

RECOMMENDATIONS

1. Strict implementation of the Plastic Waste Management (PWM) Rules, 2016, (amended in 2018), by all States / Union territories, urban and rural local bodies and others responsible. Monitoring of implementation of the said Rules.

2. Ensure uniformity across States / Union territories in policies / guidelines / executive orders, to reduce the scope and incentives for violation of the law. Uniformity would help industry to plan better and reduce the risk to investments.

3. Figure 1 (categorization of products) has been divided into 9 equal sectors, corresponding to high, medium and low environmental impact and utility. The products that are found have the lowest utility and highest environmental impact largely coincide with the list of products that have already been banned by several State Governments. The Committee recommends a phase out of such products.

4. The Committee recommends that the other products appearing in Figure 1 be placed under a well-defined EPR having pass through cost mechanism, giving industry and consumers time to adjust. Products that fail to be brought under EPR, may be subjected to restrictions.

5. The Committee recommends a Mission Mode approach, as part of the 'Swachh Bharat Abhiyan' initiative, to:
   (i) change plastic waste littering behaviour among the public;
   (ii) encourage voluntary reduction in the quantum of use of Single Use Plastics;
   (iii) enforce segregation of waste at source;
   (iv) create infrastructure and systems for collection, segregation and disposal of plastic waste, such as 'Dry waste Collection Centres';
   (v) encourage, and in the alternate, enforce implementation of the EPR mechanism.

6. Improve the functioning and status of waste pickers / rag pickers, among others by issue of ID cards and authorisations, health, education and income support measures, and financial assistance to set up their own recycling units.

7. Promote, incentivise, and upgrade the domestic plastic recycling industry (e.g. through industrial plots, finances on favourable terms, tax incentives, technology improvement and support to meet SHE norms). This would also improve the quality of recyclates. Promote 'alternate use' and 'energy recovery'.

8. Impose a ban on import of post consumer plastic waste, as well as reprocessed / recycled plastic raw materials.

9. The Committee recommends funded innovative Research efforts at domain Institute / R&D Laboratory in the area of new alternate materials, product design to improve recyclability; enhance the quality of reused / reprocessed / recycled plastics; biodegradation, oxo-biodegradation, enzymatic degradation of plastic wastes, formulation of new SOP/Indian Standards and validation of results.

10. The Committee recommends the development and adoption of a 'Circular Economy', in which resources like plastics waste acquire value, will enhance national output and employment, while alleviating environmental problems.

INTRODUCTION

Plastics are ubiquitous materials used in various application sectors such as - Agriculture, Automobile, Aerospace, Electronics, Infrastructure, Healthcare, Packaging, Textiles etc. Bestowed with superior performance characteristics, in particular their versatility, lightness, strength, barrier properties and affordability, plastics are used in thousands of products that add comfort, convenience, and safety to our everyday life.

The global plastics industry is only about a century old. However, the consumption of plastics increased exponentially during the post – war years beginning in the fifties. The Indian plastics industry made its modest beginning in the 50's. The production of Polystyrene started in the year 1957, while other polymers viz. - LDPE, PVC, HDPE and PP commenced production in the subsequent years. The present annual global consumption of plastics is about 350 MMT (million metric tonnes) [1, 2], while in India, it has been estimated to be 17.8 MMT. Plastic industry has experienced a healthy growth rate of more than 10% CAGR. It is expected that annual plastics consumption in India would cross 20 MMT by 2020 [3, 4]. Thus, plastic industry in India symbolizes a promising business segment, creating wealth, employment opportunities, to both, skilled and semi-skilled persons for and contributing to the 'Make in India' initiative. Finished plastics products also constitute a significant component of value added product exports from India

The Plastic Industry has contributed significantly to the growth of Indian economy. The key growth drivers are agriculture and food packaging, in addition to other sectors such as Infrastructure, automobiles etc. Packaging has a share of 24% in total domestic consumption followed by agriculture (23%), household items (including home furnishings: 10%), etc. The packaging segment data reveals that PE and PP accounted for around 33% and 29% of polymer usage, respectively, followed by PET (17%), PVC (7%), and others (14%) in that segment.

Table 1: Annual Polymer Consumption by Polymer Type [1]

Sl. No.	Polymer		Annual Consumption (2016-17) (KTA)
	Thermoplastics		**13,953**
1	Polyethylene (PE)		4600
2	Polypropylene (PP)		4400
3	Polyvinyl chloride (PVC)		3000
4	Polyethylene terephthalate (PET) / BOPET		1275
5	Polystyrene (PS) / Expanded PS (EPS)		375
6	Ethylene vinyl acetate (EVA)		160
7	Other Thermoplastics		143
8	Engineering Plastics		638
	(i)	Acrylonitrile butadiene styrene (ABS)	215
	(ii)	Polycarbonate (PC)	155
	(iii)	Polyamides (PA)	62
	(iv)	Polybutylene terephthalate (PBT)	42
	(v)	Styrene acrylo nitrile (SAN)	40
	(vi)	Polymethyl methacrylate (PMMA)	32
	(vii)	Polyoxy methylene (POM)	28
	(viii)	PC-ABS	15
	(ix)	Polyphenylene oxide (PPO)	6
	(x)	Fluoropolymers	6
	(xi)	Acrylonitrile Styrene Acrylate	5
	(xii)	Polyphenylene sulphide (PPS)	0.8
	(xiii)	Polysulfones	0.6
	(xiv)	Polyether imides (PEI), Polyether ketones (PEK), Polyether ether ketones (PEEK)	0.15
	(xv)	Others	0.05
9	**Thermosets**		**950**
(i)	Phenolic resins		420
(ii)	Unsaturated polyesters		225
(iii)	Urethanes		160
(iv)	Epoxy resins		76
(v)	Melamine resins		34
(vi)	Urea resins		23
(vii)	Other Thermoset Resins		12

*Total polymer consumption has been estimated to be 15500 KT (Kilotons) in 2016-17, which is expected to reach 20000 KT in 2019-20

The packaging industry is expected to grow at 18% annually (flexible packaging at 25% and rigid packaging at 15%) [5]. Packaging is the fifth largest sector in India's economy and is one of the fastest growing sectors in the country [6]. Plastics packaging provides design flexibility, can be transformed into any shape, size and thickness, sustainability for increased shelf life, tailor-ability with respect to air / water-vapour permeation and aesthetics. Plastics packaging offers safe supply of quality food and water even to remote areas. Packaging of fertilizers and pesticides at affordable cost has significantly benefitted the farmers in increasing their crop productivity. The shelf life of food and many agricultural products, as well as packing of sugar and cement, has also been enhanced with the use of plastics packaging.

With increasing use of plastics, the impact of plastics in the environment (land and water) has received critical global attention from Governments, NGO's, civil society groups and the press / media. Although recycling of plastics is technically feasible and is practiced, lightweight and smaller plastic products are difficult to collect effectively for recycling. They tend to leak into the environment, contaminating open land, landfills and waterways. The UNEP report [7] has highlighted issues connected with 'Single Use Plastics'. The problem is being addressed by various countries by curbing littering, managing plastics waste in a more organized manner and creating awareness among the consumers and producers with respect to waste management and recycling. The Head of UN Environmental Program has aptly mentioned that "Plastics are miracle material. Plastic isn't the problem. It is what we do with it." The point of improved waste management for controlling plastic pollution has been clearly brought out in this report in a ten step programme for a sustainable growth.

As estimated by the Central Pollution Control Board (CPCB), about 26,000 tonnes of plastic waste is produced everyday in India, of which about 60% is recycled [8]. Plastic waste contributes about 7% of the municipal solid waste (MSW) on average, but varies from city to city. There are very few organized facilities in the formal sector in field of plastic waste management and recycling in our country.

On June 5, 2018, on the occasion of World Environment Day, Hon'ble Prime Minister reiterated India's commitment for sustainable development and said that the country will mitigate the problem of plastics pollution through awareness, technology and global partnerships. It may be noted that although plastic consumption in India is lower compared to the global consumption, there is still an urgent need for implementing proper waste management through effective collection and segregation, coupled with improved recycling technologies. On August 15, 2019, during his address to the Nation on the occasion of India's

Independence Day, Prime Minister once again declared India's resolve to reduce the usage of 'Single Use Plastics' (SUP) particularly carry bags. He also announced a campaign to collect littered plastic for recycling.

The Asia Pacific Economic Co-operation (APEC) had estimated the impact of marine plastic pollution to the Asia Pacific region to be about USD 13 billion. [8].

More than 60 countries have introduced measures to curb single-use plastics waste such as imposing bans and levies. Some countries have imposed direct ban on single-use plastics but according to a UNEP report, the bans have not been effective in curtailing plastic pollution. Most of the bans are on carry bags and few foam products. The report discloses that other countries have taken a phased approach and in some cases, complemented with economic investments. Taiwan plans to phase-out single-use plastics by 2030 [9] [10] while European Union plans 90% separate collection target for plastic bottles by 2029 (77% by 2025) and introduction of design requirements to connect caps to bottles, as well as target to incorporate 25% of recycled plastic in PET bottles as from 2025 and 30% in all plastic bottles as from 2030 [10].

In India, pursuant to the implementation of bans on certain 'Single Use Plastics' in several States, the Department of Chemicals and Petrochemicals has received several representations from the Plastics Industry Associations enumerating the problems faced by them after the ban. Also, under the Ministry of Micro, Small and Medium Enterprises (MSME) Outreach Program launched by the Hon'ble Prime Minister on November 2, 2018, plastic sector has been identified as one of the sectors for support to MSMEs in 6 districts across the country. The Department received reports/feedback in December 2018 on MSME Support and Outreach website of the Department of Financial Services that "particular category of plastic has been banned from 2019, without any scheme of rehabilitation of MSMEs dealing with the said industry under MSMEs". In order to address this situation, an Expert Committee consisting of policy makers, scientists, academicians and researchers in the field of plastics and allied materials has been formed by the Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Government of India vide F. No. 45012/117/2018 - PC IV (FTS: 3014154) dated 13.12.2018, 15.2.2019,01.3.2019 and L.No. CIPET/HO/TSS/SUP/Ext. Time & New Members/2019 dated 12.09.2019. The composition of the Committee to define 'Singe Use Plastics' in the country is given in **Annexure I**. The dates and places of the meetings of the Committee are also in the same **Annexure I**.

As a part of its work, the Committee met with, viewed presentations and heard the views of a representative sample of stakeholders comprising of industry associations, recyclers, NGOs, activists and domain experts. The list of stakeholders presented / communicated is enclosed as **Annexure II.**

The presentations / communications made by these stakeholders are enclosed as **Annexure III.**

The Terms of Reference of the Committee are as follows:

i. To study the implementation of Plastic Waste Management Rules 2016 and Plastic Waste Management (Amendment) Rules 2018, in different States.

ii. To study the consistency in guidelines issued by the various State Governments.

iii. Assessment of the impact of ban on various types of plastic products by State Governments and other authorities.

iv. To categorise Single Use Plastic products and careful assessment of their impact on environment, economy and society with relevance / reference to Indian context.

v. To recommend the way forward for implementation of end of life solution for plastic products.

vi. To recommend the way forward for plastic waste recycling strategies to be adopted.

TERMS OF REFERENCE

i. **To study the implementation of Plastic Waste Management Rules 2016 and Plastic Waste Management (Amendment) Rules 2018 in different States**

The salient features of Plastic Waste Management Rules, 2016 and Plastic Waste Management (Amendment) Rules, 2018 as well as its implementation across different States are given in **Annexure – IV.**

In PWM Rules 2016, plastic products essentially the carry-bags of thickness < 50 microns, is banned. However, the implementation of the said Rules in different States has not been uniform and effective. CPCB's Annual Report 2017-18 on Implementation of Plastics Waste Management Rules [As per Rule 17(4) of PWM Rules, 2016 , as amended 2018], November 2018, has observed that most of the States and UTs have not established an organized system for Plastic Waste Management, and are not following proper practice of plastics carry bags labelling. Majority of States /UTs have not constituted State Level Monitoring Committee (SLMC). [11]

ii. **To study the consistency in guidelines issued by the various State Governments**

The Single Use Plastics (plastic products) banned by various States have largely been carry bags, disposable plates and cutlery, straws, table cloth, and publicity materials, which are often observed in litter, as well as in the municipal solid waste (MSW). The summary of the bans in various States is given in **Annexure – V**. The dates of implementation are not the same across different States.

iii. **Assessment of the impact of ban on various types of plastic products by State Governments and other authorities**

The Gross Domestic Product (GDP) of India was 1,88,249.66 billion rupees (2726.32 billion US dollars) in 2018 [12]. India offers an attractive opportunity for growth in the petrochemicals sector, given its plan to increase the share of manufacturing in GDP from 17% to 25% by 2022 [13]. The demographic transition, increasing urbanization, growing income levels, all support a strong case of increase in both demand and supply of petrochemicals in India.

a. Impact on Secondary Sector

The secondary sector contributed a share of 28.45% of Gross Value Added (GVA) in 2018-19 with the manufacturing sector alone at 18.32% of GVA [14]. Plastics are used for safe/ hygienic/ aseptic packaging, transportation and storage for number of important products such as cement, sugar, fertilizers, agricultural products (grains, fruits and vegetables), pharmaceuticals, perishables, water and beverages as well as many export oriented items. Alternative materials such as jute / paper / cloth / glass are scarce and may entail a higher environmental cost over their cradle-to-grave life-cycle. In addition, they do not provide the same functionality that a plastic packaging material provides. In accordance with Jute Packaging Material Act (1987), use of jute bags has been made mandatory for packaging of sugar, food grains etc [15]. However, due to shortage or disruption in supply of jute packaging material or in case of any other contingency or exigency, the Ministry of Textiles, in consultation with the user Ministries concerned, allows dilution of packaging material specifications, up to a maximum of 30% of the production of food grains and other commodities (with certain exemptions). Department of Chemicals and Petrochemicals has expressed the view that use of HDPE/PP woven sacks, having advantages over jute bags in terms of barrier properties and energy/cost savings, may be a choice of packaging material to the user sector in an open economy [16]. Similarly other key manufacturing sectors - cement, fertilisers etc. would be adversely affected by ban on plastics packaging.

b. Impact on Agricultural and Services Sector

The agricultural sector contributed a GVA share of 17.1% in 2018-19 [14]. The estimated size of Agriculture and Forestry sector is around Rs. 32.2 lakh crore. Contribution of the Agriculture sector in Indian economy is much higher than the world's average (6.1%) [14]. Plastics such as LLDPE, LDPE and HDPE, PP, PVC and PC are extensively used in agricultural applications e.g. for mulching, low tunnels, drip / sprinkler irrigation and green houses. Plastic films are used to suppress weeds and conserve water in crop production and landscaping. Plastic mulches also act as barriers to keep fertilizers and pesticides in the soil. Much of marketed agricultural produce moves in plastic bags/packaging. It has been estimated that the market for agricultural packaging in the Asia Pacific region is projected to grow at a CAGR of 6.17% from 2018 to 2023 [17], owing to the expansions of major agrochemical and agricultural packaging players in this market, and growing demand for biological products that have opened opportunities for the development of

better packaging techniques in this industry. Progress towards sustainable agriculture consisting of reduced use of chemicals in agriculture and reduction in water usage depend critically on use of plastics in agriculture. Significant segments of the service economy are dependent on the use of plastics. These include medical services industry, food service and delivery, e-commerce, education, information technology etc.

c. Impact on Plastics Industry

The Plastic industry and its upstream, the petrochemical sector, has been a major source of GDP, employment and tax revenue in India. It has been estimated that the ban imposed by Maharashtra State alone in 2018 would hit the plastic industry hard. A loss of Rs. 15,000 crore is projected, apart from leaving nearly 3 lakh people jobless [18]. The bans on plastic products across more than half of India's States have had businesses scrambling for cost effective solutions. Businesses dealing in food, drink, retail and e-commerce are set to be the most affected by the changes in regulations regarding single-use plastics, owing to their ubiquitous use in packaging. While the numbers would depend on the number of products banned, number of States banning these and effectiveness of enforcement, it can be stated that the impact on turnover and jobs would be high. Further, investments made would be at risk of turning into Non-Performing Assets (NPAs).

d. Quantum of Plastic Waste in India

As per a study conducted by Central Pollution Control Board (CPCB) in 60 major cities of India, 4059 tonnes per day of plastic waste is generated from these cities. The fraction of plastic waste in total Municipal Solid Waste (MSW) varies from 3.10% (Chandigarh) to 12.47% (Surat). Average plastic waste generation is around 6.92% of MSW [8]. By extrapolation of the plastic waste generation data from 60 major cities, it is estimated that about 25,940 ~ 26,000 tonnes per day of plastic waste is generated in India. Data shows that out of total plastic waste, about 94% consists of thermoplastic content, which is recyclable, such as PET, LDPE, HDPE, PVC etc. and the balance 6% belongs to the family of thermoset and other categories of plastics such as SMC, FRP, multi-layered packaging, foamed products like thermocol etc., which are not easy or economical to recycle.

The effect of the ban on plastics, on the environment can be assessed in terms of the reduction of the quantities of banned items in the municipal waste, and in the uncollected litter. Authentic pre- and post-ban comparative data in this regard is not available at present.

iv **To categorize Single Use Plastic Products and careful assessment of their impact on environment, economy and society with relevance / reference to Indian context**

a. **Single Use Plastics:** A report containing an assessment of the environmental, social and economic impacts of mismanaged and problematic single-use plastics, in particular bags and foamed plastic products, was published by UNEP in 2018 [7]. In this report, the term 'Single Use Plastic' is used to denote certain disposable plastic products which can cause environmental problems. The said Report contains a 10-step roadmap for policy makers, on managing single use plastics and their waste.

A universally accepted definition of 'Single Use Plastics' has not yet emerged. Different definitions or guidelines available are summarized below:

UNEP: "Single-use plastics, often also referred to as disposable plastics, are commonly used for plastic packaging and include items intended to be used only once before they are thrown away or recycled. These include, among other items, grocery bags, food packaging, bottles, straws, containers, cups and cutlery". [7]

UK: "All products that are made wholly or partly of plastic and are typically intended to be used just once and/or for a short period of time before being disposed of". [19]

Further they have added "Examples of items commonly recognized as single-use plastics include: takeaway boxes, disposable coffee cups, stirrers, plastic wrap, polystyrene packaging and cigarette filters. However, the government wants to understand more about how to define single-use plastic and what items fall into this category, recognizing that there may be a spectrum in terms of their effects on the environment and viability of alternatives."

EU: "Single use plastics means a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its lifespan, multiple trips or rotations by being returned to a producer for refill, or reused for the same purpose for which it was conceived". [20]

MoEF: The Ministry of Environment and Forest have issued guidelines following the UNEP definition namely, "Single-use plastics, often also referred to as disposable plastics (use-and-throw items), are commonly used for plastic packaging and include items intended to be used only once before they are thrown away or recycled. These include, among other items, carry bags, food packaging, bottles, straws, containers, cups and cutlery". [7]

Proposed definition from stakeholder (industry): "Single use plastics are those which after their first use cannot be reused safely nor are recycled and escape the EPR obligations". [21]

Indian Standards: The Bureau of Indian Standards is planning to discuss this shortly.

The MoEF & CC has adopted the UNEP definition and issued it as a guideline to the States, the Committee recommends continuing with MoEF & CC guidelines, and adopting it as a definition, in the Indian context.

"Single-use plastics, often also referred to as disposable plastics (use-and-throw items), are commonly used for plastic packaging and include items intended to be used only once before they are thrown away or recycled. These include, among other items, carry bags, food packaging, bottles, straws, containers, cups and cutlery".

b. Categorization of Single use Plastic Products:

Single Use Plastic Products can be categorized on the basis of their utility on the one hand, and the adverse impact on the environment on the other. Each product should be examined in a scientific manner on the basis of utility of the product, with associated adverse impact on the environment. The procedure followed is outlined below.

Five factors of utility, namely hygiene, product safety, essentiality, social impact and economic impact are considered. Every packaging is expected to provide product safety, and additionally, hygiene for food and pharmaceutical products. Some packaging may not be essential and may be more for convenience or for aesthetic presentation. Certain products i.e. small size sachets may provide affordability of the product contained in it. Each factor is assigned a maximum of 20 marks and the five factors are added. Thus the total maximum score for high utility will be 100. Total marks of zero will indicate no utility.

Similarly five factors for adverse impact on the environment are considered. These are: collectability, recyclability, possibility of end of life solutions, environmental impact of alternate materials and littering propensity. If adverse environmental impact is high, the maximum score will be 100. Conversely, the score will be zero for low adverse environmental impact.

Therefore, for any useful and environment friendly product, the utility impact should be high and the score for the adverse impact on the environment should be low. Conversely, low utility score accompanied by high adverse environmental

impact score will indicate an environmentally problematic and mismanaged product.

Each of the factors considered is discussed below.

Utility

1) **Hygiene:** This aspect is connected to conditions or practices that help to maintain health by preventing contamination. Both rigid and flexible packaging (i.e. film) are used for packing/delivering food and non-food items. For food and pharma packaging, barrier properties and aroma retention is also important. The level of hygiene required is dependent on end-use.

Rating criteria (marks) as follows:

(a) 0-5 marks: Not applicable, minimum/basic protection, minimum protection against contamination.

(b) 6-10 marks: Protection and control of contamination better than in (a) above, but may not protect against water vapour and air

(c) 11-15 marks: Packaging provides better barrier properties to water vapor and air than in (a) and (b) above, but may not seal in aroma in food application.

(d) 16-20 marks: Packaging provides best possible barrier properties to contamination, water vapor, air and aroma.

2) **Product safety:** This aspect is related to (a) integrity of the product, (b) protection of product against adulteration, counterfeiting, pilferage and spillage (c) safe delivery till it reaches the end user (d) retention of properties as required, reduction of wastage.

Rating criteria (marks) as follows:

(a) 0-5 marks: Not applicable, minimum/basic protection for safe handling and transport.

(b) 6-10 marks: Ensures protection of product better than in (a) above.

(c) 11-15 marks: Ensures protection of product better than in (b) above.

(d) 16-20 marks: Best possible level of protection for given product.

3) **Essentiality:** Whether product is essential for the intended use and whether affordable alternative is available.

Rating criteria (marks) as follows:

(a) 0-5 marks: Minimum/basic utility. Affordable alternative available.
(b) 6-10 marks: Desirable level of utility better than (a) above. Cost of alternative is higher than (a).
(c) 11-15 marks: Essential for modern life style. Alternatives have low availability and higher cost.
(d) 16-20 marks: Most essential or critical. No alternative available.

4) **Social impact:** It is related to lifestyle and/or fraction of population using the product.

Rating criteria (marks) as follows:

(a) 0-5 marks: Not applicable or used by very few people.
(b) 6-10 marks: Product use restricted to small number of people. Social impact higher than (a).
(c) 11-15 marks: Product use spread over a very large number of people.
(d) 16-20 marks: Universal or ubiquitous use.

5) **Economic Impact:** It is related to the plastic industry and therefore the consumption of plastics for the specific application. The influence of product on the total value chain is also considered.

Rating criteria (marks) as follows:

(a) 0-5 marks: Plastic resin consumption less than 15,000 tonne per annum.
(b) 6-10 marks: Plastic resin consumption more than 15,000 tonne and less than 50,000 tonne per annum.
(c) 11-15 marks: Plastic resin consumption more than 50,000 and less than 125,000 tonne per annum.
(d) 16-20 marks: Plastic resin consumption more than 125,000 tonne per annum.

Environmental adverse impact

1) **Collectability:** It is related to ease of collection, and amount of waste being collected. If more waste is collected, less will be seen in litter. Scattered and contaminated waste, as well as small- size and light weight waste, is difficult to be collected.

Rating criteria (marks) as follows:

(a) 0-5 marks: More than 70% of product waste being collected. Existence of a buyback, EPR or any such scheme.

(b) 6-10 marks: Collection less than 70% and more than 40%.

(c) 11-15 marks: Collection less than 40% and more than 10%.

(d) 16-20 marks: Less than 10% being collected.

2) **Recyclability:** It is related to prevalent rate of recycling (mechanical, chemical and thermal).

Rating criteria (marks) as follows:

(a) 0-5 marks: Recycling rate more than 65%.

(b) 6-10 marks: Recycling less than 65% and more than 40%.

(c) 11-15 marks: Recycling less than 40% and more than 10%.

(d) 16-20 marks: Recycling less than 10% Non-recyclables.

3) **End of Life (EoL) solutions:** It is related to suitability and availability of technology for end of life solutions such as alternate use, use in bitumen road, use in cement-kiln, energy recovery etc.

Rating criteria (marks) as follows:

(a) 0-5 marks: Not applicable, or more than 70% being used for EoL solutions.

(b) 6-10 marks: EoL solutions less than 70% and more than 40%.

(c) 11-15 marks: EoL solutions less than 40% and more than 10%.

(d) 16-20 marks: Less than 10% being used for EoL solutions.

4) **Impact of alternative on the environment:** This factor is related to availability, affordability and impact of any possible alternative on environment. Reference may be made to Life Cycle Assessment (LCA) alternatives.

Rating criteria (marks) as follows:

(a) 0-5 marks: Alternative not available or alternative has low adverse impact on environment.

(b) 6-10 marks: Alternative has higher environmental impact (LCA analysis) than at (a) above.

(c) 11-15 marks: Alternative has higher adverse environmental impact (LCA analysis) than that in (b) above.

(d) 16-20 marks: Alternative has very high adverse environment impact (LCA analysis).

5) **Littering Propensity:** This factor is related to litter caused by the product and found in public places, remote places, villages, tourist spots, seas, beaches, roads, rivers and water bodies, waste water streams etc.

Rating criteria (marks) as follows:

(a) 0-5 marks: Less than 10% of the product found in litter.

(b) 6-10 marks: Found in litter less than 40% but more than 10%.

(c) 11-15 marks: Found in litter less than 70% but more than 40%.

(d) 16-20 marks: More than 70% of product waste found in litter.

Example 1 (carry bags < 50 micron thickness): Above criteria can be applied to any plastic product. In utility criteria carry bags score 3 marks for hygiene (limited or occasional hygiene as goods such as vegetables or fruits purchased from the market are covered for a short while), 3 marks for product safety (the goods kept inside the carry bags are protected from surrounding goods and from contamination resulting from a drop) , 4 marks for essentiality (the carry bags are more of a convenience and not essential as other alternatives can be used), 11 for social impact (carry bags are used by a large number of people) and 11 for economic impact (It is estimated that the plastic resin consumption is about 110,000 tons). In the adverse impact criteria this product scores, 18 marks for collectability (most carry bags are not collected), 16 marks for recyclability (although carry bags can be recycled, they are not recycled because of contamination in the waste), 16 marks for EoL solutions (most carry bags are not put to any EoL solutions), 16 marks for impact of alternative and 18 marks for littering propensity (carry bags littered at almost every place). Considering these marks, carry bags score only 32 marks for utility and 84 marks for the adverse impact on the environment. Therefore carry bags may be termed mismanaged and problematic single use plastic product.

Example 2 (mulch, silage and greenhouse films): These films are generally made of polyethylene. The score for utility is: 6 marks for hygiene (retention of the fertilizers or pesticides used during crop cycle), 3 marks for product safety (offers minimum protection to the crop from external sources), 13 marks for essentiality (it is essential to protect the crop, retain moisture and enhance crop yield), 13 marks for social impact (widely used in agriculture by a large number of farmers), 16 for economic impact. The score for the adverse impact on the environment is: 8 for collectability (the amount of mulch films being collected is more than 40 %), 7 for recyclability (almost all of collected mulch films are recycled), 7 for EoL solutions (there is no need for EoL solution), 7 for impact of alternative (organic mulch has

low adverse impact; glass is an alternative for green house) and 3 for littering propensity (the film does not get littered, but some part of film may get separated occasionally). Thus the total score for utility index is 51 and adverse impact on environment is 32. Therefore, the mulch films are not mismanaged and problematic single use plastic product.

Table 2 below lists a number of disposable plastics products and also gives the utility and the environmental adverse impact scores.

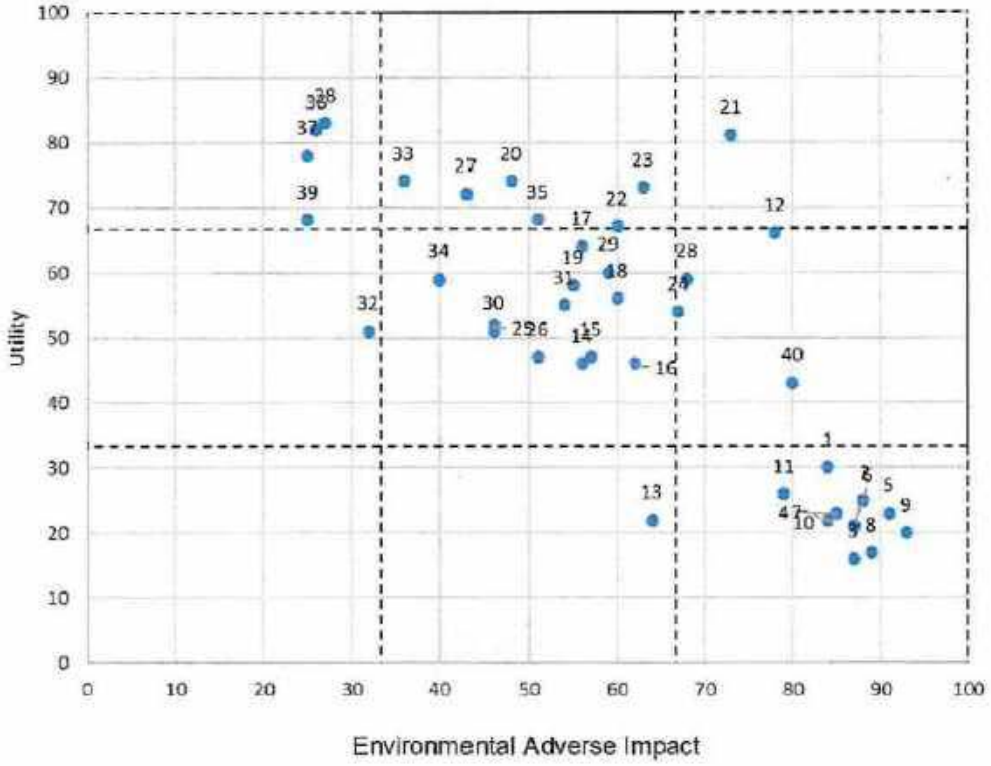
Table 2: Single Use (Disposable) Plastic Products with Utility and Environmental Adverse Impact score

S. No.	Name of the product	Hygiene	Product safety	Essentiality	Social impact	Economic impact	Total	Collectability	Recyclability	EoL Solutions	Alternative impact	Littering propensity	Total
1	Carry bags- thin (less than 50 microns)	3	3	4	11	11	32	18	16	16	16	18	84
2	Non-woven carry bags and covers (less than 80 gsm and 320 microns)	1	3	3	7	7	21	17	18	18	16	18	87
3	Straws/ Stirrers	4	3	3	2	4	16	19	18	13	19	18	87
4	Small Wrapping/Packing films	4	8	4	3	3	22	18	16	15	17	18	84
5	Cutlery: Foamed cups, bowl and plates	4	4	3	8	4	23	18	19	18	18	18	91
6	Cutlery: Laminated bowls and plates (non-foamed)	4	4	3	7	7	25	18	19	17	16	18	88
7	Cutlery: Small plastic cups/containers (less than 150 ml and 5 g)	4	4	4	7	4	23	18	15	16	17	19	85
8	Ear buds and plastic sticks (for balloons, flags, candies etc.)	6	0	3	4	4	17	19	19	15	18	18	89
9	Cigarette filters (non-biodegradable)	1	7	4	1	7	20	19	19	18	18	19	93
10	EPS (Thermocol® and similar) for decoration	0	0	4	12	7	23	16	16	18	18	17	85
11	Small plastic bottles for drinking water (= 200 ml)	6	3	3	7	7	26	17	13	15	16	18	79
12	Small multilayer pouches/sachets (area less than 36 cm2)	14	14	12	13	13	66	16	15	15	15	17	78
13	Plastic banners (thickness less than 100 microns)	0	0	8	7	7	22	12	8	15	16	13	64
14	Disposable rigid cups, trays, and containers	7	7	7	12	13	46	9	9	13	12	13	56
15	Mailing envelopes	4	8	10	12	13	47	12	10	10	15	10	57
16	Cigarette overwrap films	13	8	10	8	7	46	15	12	12	8	15	62
17	Wrapping films for food applications	15	15	13	13	8	64	10	10	10	14	12	56
18	Wrapping films for e-commerce applications	8	12	12	13	11	56	12	12	12	11	13	60
19	Cling films (food and industrial packaging)	15	13	13	10	7	58	11	12	12	7	13	55
20	Bakery and grocery packing films	17	17	11	17	12	74	8	8	12	12	8	48
21	Multilayer packaging (area more than 36 cm2)	16	17	14	17	17	81	14	17	16	10	16	73
22	Brick cartons (Tetra Pak® and similar)	16	18	13	13	7	67	12	12	13	13	10	60
23	Blister packaging for pharmaceutical applications	18	17	13	13	12	73	15	13	14	10	11	63
24	Blister packaging for non-pharma applications	8	15	12	12	7	54	15	13	14	13	12	67
25	Shopping bags (more than 125 micron thickness)	5	8	10	16	13	52	11	8	7	11	9	46

S. No.	Name of the product	Hygiene	Product safety	Essentiality	Social impact	Economic impact	Total	Collectability	Recyclability	EoL Solutions	Alternative impact	Littering propensity	Total
26	Non-woven bags (more than 80 gsm weight and more than 300 micron thickness)	3	8	10	13	13	47	11	8	8	13	11	51
27	Milk and oil pouches	14	16	13	16	13	72	7	7	7	10	12	43
28	Retort pouches for ready-to-eat microwavable and boiling water food items	17	17	13	8	4	59	16	13	14	10	15	68
29	Shrink film	10	15	12	13	10	60	13	11	9	13	13	59
30	Air cushions industrial packaging: Bubble wraps, Foam, Air Pillows	4	16	16	7	8	51	11	8	8	10	9	46
31	Disposable industrial packaging (EPS)	4	13	13	12	13	55	13	13	8	13	7	54
32	Films for mulch, silage, greenhouse applications	6	3	13	13	16	51	8	7	7	7	3	32
33	Plastic bottles for food and beverages (more than 200 ml)	17	17	13	13	14	74	4	5	7	7	13	36
34	Plastic bottles for non-food	9	17	13	9	11	59	5	7	7	8	13	40
35	Non-woven textile for medical and personal care items	17	2	18	18	13	68	16	16	7	7	5	51
36	IV bottles	20	13	20	20	9	82	5	7	8	3	3	26
37	IV bags/ Blood bags	20	13	20	20	5	78	5	5	7	5	3	25
38	Disposable syringes	20	13	20	20	10	83	5	6	8	3	5	27
39	Catheters	20	3	20	20	5	68	5	5	7	5	3	25
40	Tea-bags	9	15	8	8	3	43	18	16	13	16	17	80

The score for utility are plotted on Y axis and score for environmental adverse impact is plotted on X axis. The graphical presentation of the data in Table 2 is shown in Figure 1.

Figure 1: Utility vs. Environmental Adverse Impact for a range of Single Use Plastic products – graphical presentation



Some of representative Single Use Plastic products which need to be phased out as early as possible are as follows:

(I) Thin carry bags (less than 50 micron),

(ii) Non-woven carry bags and covers (less than 80 gsm and 320 microns),

(iii) Small wrapping / packing films,

(iv) Straws / Stirrers,

(v) Cutlery: Foamed cups, bowl, plates,

(vi) Cutlery: Laminated bowls and plates (non – foamed),

(vii) Cutlery: Small plastic cups / containers (less than 150 ml and 5 g),

(viii) Ear buds with plastic sticks, and plastic sticks for balloons, flags, candles etc.,

(ix) Cigarette filters (non-biodegradable),

(x) Expanded Polystyrene used for decoration,

(xi) Small plastic bottles for drinking water (≤ 200 ml),

(xii) Plastic banners (less than 100 microns thickness)

Typical photographs of these 12 items are given below in Figure 2 [the photographs displayed below are for illustrative purpose only; there is no copyright infringement].

 Thin carry bags (less than 50 microns)	 Non- Woven carry Bags and covers (less than 80 gsm and 320 microns)
 Small Wrapping / Packing films	 Expanded Polystyrene [Thermocol R and similar for decoration]
  Straws / Stirrers	 Cutlery: Foamed Cups, bowl, plates
  Cutlery: Laminated bowls and plates (non – foamed)	  Cutlery: Small plastic cups / containers (less than 150 ml and 5 g)
 Ear buds and plastic sticks (for balloons, flags, candles etc)	 Cigarette filters (non-biodegradable)
 Small plastic bottles for drinking water (≤ 200 ml)	 Plastic banners

Compostable, oxo-degradable and oxo-biodegradable plastics for application in grocery bags or carry bags

Compostable carry bags: Compostable carry bags do not compost under all conditions. In accordance with PWM Rules, 2016 and its amendment of 2018, "Compostable plastics are defined as any material that undergoes degradation by biological processes during composting to yield CO_2, water, inorganic compounds and biomass at a rate consistent with other known compostable materials, excluding conventional petro-based plastics and does not leave visible, distinguishable or toxic residue."

However, for the composting of these products, a separate composting facility needs to be created with specific environmental conditions, according to widely accepted international standards such as IS/ISO 17088, ISO 14855-1and 2, ASTMD 6400, ASTMD 5338 and EN 13432. The conditions required for the decomposition of compostable bags do not exist in the municipal landfills [22]. Compostable plastic packaging is not a blanket solution, but rather one for specific, targeted applications [23]. Most compostable plastics are more expensive as compared to conventional plastics. As of now, raw material for compostable plastics is not available in sufficient quantities in India.

Further, there should be a clear identification of these products to distinguish from other conventional plastic products. Recycling of conventional plastic products gets adversely affected if conventional plastics and compostable plastics are mixed.

Oxo degradable and oxo bio degradable plastic carry bags

These bags are produced by adding a small quantity of 'catalyst or pro-degradant additive' to the conventional grades of polyethylene/polypropylene and manufactured using the process used for the conventional carry bags. The degradation of these bags is evaluated in accordance with international standard, ASTM D6954 – 18.

The industry claims that under favourable environmental conditions of heat, oxygen and sun light, the base polymer degrades into lower molecular weight. It is claimed that the low molecular weight degraded plastics will undergo biological degradation to produce carbon dioxide, water, and biomass. These claims have not been validated in scientific literature. The Report from the Commission to the European Parliament and the Council, Brussels, 16.01.2018 COM (2018) 35 final [24], has raised issues related to potential toxic effect of the oxidising additives, apart from the resultant micro plastics, in both land and marine environments. More scientific research needs to be undertaken to validate the claimed oxo-degradation and bio-degradation of these plastics.

ToR V and VI – Recycling and EoL solutions: Elements that need Support and Development

The two sections that follow this section, corresponding to ToRs V and VI, outline the technical aspects of recycling and EoL solutions. This section attempts to draw attention to certain elements of the post-consumer value chain that are well recognised in the law, but have remained neglected or unaddressed.

Plastic waste constitutes an identifiable stream within the municipal solid waste (MSW). Any improvement in the collection, segregation, transportation and disposal of MSW therefore will reflect in the improvement of the disposal of plastic waste. As with all MSW, improvement in the disposal of plastic waste can be measured by assessing and characterising the quantity of plastic in MSW, vis-à-vis the quantity going into landfills, and the quantity that remains littered in the environment.

Successful and viable application of recycling or EoL solutions depends on:

(a) Assured, continuous and adequate supply of clean plastic waste segregated from other MSW; the plastic waste should be further segregated by plastic type for better value realisation in recycling.

(b) The existence of a modern and profitable recycling / EoL industry that complies with safety, health and environmental (SHE) regulations applicable to the industry.

While India has high rates of mechanical recycling, reported to be about 60% of the consumption of thermoplastics, this apparent achievement stands on two pillars with weak foundations.

The 'waste pickers' (as defined in PWM Rules, 2016), known colloquially as 'rag-pickers', are possibly the most important source of recyclable plastics. They constitute a socially heterogeneous but professionally similar vulnerable group, at the bottom of India's socio-economic structure. Their number is variously estimated to be between 1.5 million and 4 million [25, 26, 27]. They live and work in unhealthy conditions. They have uncertain incomes and run into confrontation with various Governmental / law enforcement agencies.

The waste pickers/rag pickers may also serve as the primary collection agency of MSW from households and enterprises. They are therefore key to collection, segregation, cleaning and disposal of not only plastic waste but all reusable and recyclable waste that is discarded rather than sold, by households and enterprises. Members of this professional group are often workers in the unorganised recycling industry, and in the 'kabadi / raddi' system that constitutes a parallel and commercially driven source of supply of post-consumer plastics for recycling.

Though recognised in the PWM Rules as an important part of the chain for supply of post consumer plastics, this group has received little or no attention from Government agencies, so far.

The Committee therefore recommends that waste pickers/rag pickers be identified and recognised by local bodies, by the issue of ID Cards that would also give them the right to collect littered MSW, including plastic waste. Enforcement of rules for segregation and cleaning of waste at source, to avoid co-mingling of different plastics; Labelling of plastic products by type of plastic used; gradual reduction in products made of a combination of different plastics or plastics with other materials; training in safe collection of waste and use of personal protective equipment, support for health, education and income generation; for the more enterprising, support on favourable terms to start their own recycling / EoL units is recommended.

Barring a few units that recycle PET bottles, the plastic recycling industry in India consists of thousands of small units in the unorganised sector. Each plastic consuming urban agglomeration has a corresponding hub of recycling. As with the waste pickers, they are largely left to their own devices with no Government support, but subject to high regulatory pressure. These units are likely to be non-compliant with safety, health and environmental regulations. While the regulatory actions are no doubt legally justified, such actions detract from the overall objective of tackling the challenge of 'Single Use Plastic' waste [28].

The Committee therefore recommends that the recycling industry be assisted to upgrade in terms of technology, SHE compliances and financial viability.

Specifically, such assistance would include provision of plots with pre-approved environmental clearances, financing on favourable terms, technical assistance, power supply, assured supply of clean and segregated plastics from Urban Local Bodies (ULBs) etc.

The Bruhat Bengaluru Mahanagar Palike (BBMP) [29] has started a programme for establishment of a 'Dry Waste Collection Centre' in each ward, for collection and segregation of MSW. These Centres have the infrastructure to purchase, collect, aggregate and process the various streams that make up the MSW. They impart value to much of the MSW and in the process, provide employment. The Committee recommends that this model be studied and emulated.

Extended Producers Responsibility (EPR) and Sustainability

PWM 2016 (and its Amendment, 2018), places responsibility for EPR on the Producers, Importers and Brand Owners for the waste produced from their products. The EPR concept in India is largely connected with litter and other environmental issues, but has not even begun to be implemented. Waste picking is not a preferred profession, and may well to decline with rising education and income levels. A more formal waste collection system, such as EPR, therefore needs to be put into place and made functional, as in developed nations.

Litter: This is related to the littering habit of people. This can be addressed in two ways: Awareness and punitive actions. Awareness aims to cause behavioural change. A massive program needs to be undertaken in increasing awareness and cleanliness habits. Professional associations, educational institutes, NGOs, social media can contribute in this programme. The funds can be made available from CSR and/or EPR. This program should continue for a sufficient duration. The ULBs and Gram Panchayats need to participate actively. A time bound program should be designed with all participants concerned. Failure to abide by the rules for antilittering program should attract fines and punitive actions.

Collection: The waste needs to be segregated into wet and dry components at source. Dry waste can be segregated into separate bins for different kinds of waste (plastic, glass, metal, paper etc) and wet waste (mostly food waste). The wet component can be composted at site by the homeowner or enterprise owner, or else sent to a common composting facility.

Segregation: The collected dry waste should be brought to a site of segregation. The dry waste has then to be segregated into various components depending on the final disposal and value generation.

EPR: The collection and segregation activity will incur cost. The selling of waste or products derived from waste will generate funds. The collection cost in cities will differ from that in smaller towns and villages. Similarly the funds generated from selling the waste will also vary from location to location.

The economic viability gap (difference between the costs of collection and the funds generated by selling the waste to the recyclers) is the EPR cost.

A proper guideline for implementation of EPR needs to be developed. Some points in this connection are considered here.

Suggested EPR Mechanism: The EPR cost has to be borne by the brand owners or the businesses putting the product in the market. It has to be product specific.

Some examples are given below:

Multilayered packages (MLPs): These constitute a significant part of non-recycled plastic waste. The businesses should declare the quantity of MLPs introduced in the market in a given State or Union territory and should organize to collect that much amount of waste MLPs and ensure recycling through any accepted method. A digital platform can be created to maintain the data of collection and recycling done along with the quantity introduced in the market.

Monolayer or multilayered films made from single family plastics: A business house may be putting the film directly in the market or selling these films to other businesses such as MLPs or milk/oil/confectionary houses/stationary manufacturers etc. The business house putting the film in the market will be responsible for the EPR. The upstream partners in making the products would be mentioned by the brand owners putting the final products in the market. For a given product, the entire manufacturing chain may be getting the benefits of EPR.

Rigid containers/ boxes/ trays: These are used for packing food and non food items. The business houses putting these rigid products are responsible for the EPR.

Bottles for water and beverages: Although the rate of recycling is quite high for the PET bottles of large size, a sizable number of bottles may still remain uncollected or recycled. The brand owners or businesses putting these bottles into market are responsible for EPR.

Bottles for non food applications: These may be of different sizes and colours. The brand owners or business houses putting these bottles into market should be responsible for EPR.

Additional comments on EPR: Implementation of the EPR and financial model may be decided in consultation with the stakeholders. A system that dynamically reviews the implementation process and results, and authorises the changes needed, can be set up at the State level. The Central Government must ensure that the State level bodies are constituted and functional.

The above points are only suggestions and not guidelines of EPR.

v. To recommend the way forward for implementation of end of life solution for plastic products

The Plastics Waste Management Rules 2016 (and its Amendment 2018) have defined the responsibilities of Urban Local bodies (ULBs) and Gram Panchayats. As per the Extended Producers Responsibility (EPR), Producers, Importers, Waste Generators and Brand Owners have been made responsible for the waste produced from their products.

End of life solutions (EoL), for plastic wastes are used when conventional mechanical methods of recycling or reprocessing are not feasible for any reason. Japan, Singapore and some European countries have been practicing these over years [30].

Salient features about recycling in Japan

Implementation of various technologies to reduce the plastic waste has been successfully employed in Japan and some European nations. Japan Institute of Waste Management has published data on the waste management. The recycling statistics (2016) is given below:

- Domestic Waste: Mechanical recycling (14.70%), Liquefaction, gasification, blast furnace (6.11 %), Densified-refuse derived fuel/cement material and fuel (6.33 %), Incineration with power generation (45.25 %), Incineration with heat utilization facility (6.79 %), Incineration without power generation or heat recovery (14.93%), Landfill (6.11 %).

- Industrial waste: Mechanical recycling (27.75%), Liquefaction, gasification, blast furnace (1.66%), Densified-refuse derived fuel/cement material and fuel (26.01%), Incineration with power generation (19.88 %), Incineration with heat utilization facility (11.18%), Incineration without power generation or heat recovery (5.18 %), Landfill (8.49%).

- Overall all waste: Mechanical recycling (22%), Liquefaction, gasification, blast furnace (4%), Densified-refuse derived fuel/cement material and fuel (17%), Incineration with power generation (32%), Incineration with heat utilization facility (9%), Incineration without power generation or heat recovery (10%), Landfill (7%).

The total plastic waste processed is 83% while the non-utilized waste is 17%. Similar model may also be adopted in our country to manage plastics waste while giving importance to alternate processes such as, chemical recycling, energy recovery, PPT, apart from mechanical recycling technology widely implemented.

Co-processing of plastic waste in cement kilns, mixing of waste plastic coated aggregate mixed with bitumen for laying plastic-tar road, chemical recycling and conversion of waste into energy and mechanical recycling are well defined in scientific literature as well as approved in CPCB guidelines [31]. The adaptation of new technologies has not progressed in India, and this need to be encouraged and developed.

vi. To recommend the way forward for plastic waste recycling strategies to be adopted.

Present status: According to the Federation of Indian Chamber of Commerce and Industry (FICCI), the plastics recycling industry in India employs over 1.6 million people and has more than 7500 recycling units [32]. In India, recycling has been managed by very small size players, who employ elementary waste segregation process and lack scientific know-how on waste collection, segregation and disposal. Mechanical recycling is widely practiced in the country at a recycling rate of 60%. The plastic industry needs upgradation of technology for mechanical recycling. The new processing machineries work with energy efficient processes and the reprocessed granules are cleaner and have better quality.

Marking of Plastic Products: The plastic products that are disposed of should have proper marking requirements on the packaging of the product or on the product as prescribed by the Indian Standards and as prescribed in PWM 2016.

This needs to be implemented effectively.

The marking helps segregation of waste products for appropriate waste management options.

- **Promoting Sustainable Plastics Recycling Business Models:** Recycling Technologies in particular Mechanical Recycling, which is most commonly practised in India generates low value recycled products that lack desirable attributes. The mechanical recycling leads to manufacture of various products, including products with non-plastic content.

To improve the quality of the recycled products and value addition, some of the suggestions are given below:

- Value addition of the recycled grades needs to be created which may be a viable alternative to virgin plastic for the product and packaging needs.
- Introduction of recycled content in single use plastics products and setting up targets to incorporate recycle content to the producer.
- Creation of recycling facilities and market for reused and recycled products.
- Adopting Chemical Recycling Technique in India to generate the initial building blocks which can address value addition of waste plastics.
- Setting up of recycling plants in rural areas, cities should be encouraged by the Government through fiscal incentives like industrial plots, capital subsidy, interest subvention, preferential GST rate on recycled products and input credit rate of the plastics waste, in order to promote recycling and associated employment in this sector.
- A ban on import of post consumer plastic waste as well as reprocessed raw material in the form of granules or flakes should be imposed.
- Public-Private Partnership with large state-wide entities and multi-national corporations towards the waste-to-product recycling needs to be encouraged.

• **Design of Plastic Products:** Plastic products should be manufactured taking into account their intended use, life span, the ease of production, reusability and recyclability. To improve the recyclability without losing the functional properties, a change in design of the product can be one of the sustainable solutions. Some steps in this direction are listed below:

- Designing of the packaging using only one type of plastic;
- Minimising and standardising the use of additives wherever possible, using generic, common plastic blends to simplify recycling;
- Investigating the applications use of recycled plastics for new products.

RESEARCH AND DEVELOPMENT

The Committee recommends funded research and development efforts in pursuit of the overall objectives of the Government. A few examples are given below.

Product and Packaging Design

- Replacing multilayered films or containers by thicker films from single family plastics. This will enable easy collection and recycling using existing technology.
- Reducing the weight of packaging by creating products which can be used for reconstitution of final product. For example, dry ketchup powder or its concentrate can be considered. The customer can add water as per the procedure suggested by the manufacturer. This will reduce the weight of water in the ketchup in the present practice. Similarly shampoo, milk, yogurt, soft drinks and similar products could be considered.
- Reusable containers could be designed and market tested to replace MLPs.
- Some packaging is overdesigned. A new set of shelf life could be considered which will require lesser thickness of packaging or single layer film could replace multi layered plastic packaging.

Recycling

- Characterize the waste from different sources and based upon the change in properties as compared to virgin plastic, additives and stabilizers can be incorporated to upgrade the properties to be very close to virgin plastics.
- Study the effect of bio degradable plastics on the recycling of different non bio degradable plastics.
- Evaluate the change in the soil characteristics if biodegradable plastics are composted in land for agricultural purpose.
- Determination of microplastics if any in the soil ecosystem in case of the biodegradable plastics composted on land.
- Prepare standards for fuel derived from waste plastics.
- Upgradation of fuel derived from waste plastic through processes such as hydrogenation of unsaturated components, removal of nitrogen and oxygen from the fuel etc.

Impact on Marine Environment

- Characterise and quantify the leakage of waste plastics in particular the micro plastics into the marine environment, and its impact. Indian data on this aspect is lacking at present.

Enzymatic Degradation of Plastics

- Development of enzymes for attracting bacteria which promotes biodegradation of plastics in soil
- Evaluate the mechanism of biodegradation and assess traces of microplastics post enzymatic degradation

Techno commercial evaluation of EoL facilities

- The scale of operation for EoL is very important. The optimum or near optimum size of plants for road to cement, use in cement kilns, generation of power, chemical recycling.

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Annexure I

Composition of the Expert Committee and Details of the Expert Committee Meetings

COMPOSITION OF THE EXPERT COMMITTEE

1. Shri Indrajit Pal, IAS (Retd.), Former Secretary (C&PC) - Chairman
2. Chairman / Representative, CPCB, Parivesh Bhawan, Shahdara, Delhi - Member
3. Prof. (Dr.) R. Vasudevan, Dean ECA, Thiagarajar College of Engg. Madurai - Member
4. Dr. Swaminathan Sivaram, Professor & INSA Sr. Scientist, IISER, Pune - Member
5. Prof. Dwarkanath Dattatraya Kale, Former Professor & Head, ICT, Mumbai - Member
6 Shri V. K. Diundi, Sc-F & Head / Shri Vijaykumar Gupta, Sc-C (PCD), BIS - Member
7. Additional Secretary, MoEF & CC, Govt. of India, New Delhi - Member
8. Joint Secretary (SBM), MoH & UA, Govt. of India, New Delhi - Member
9. Joint Secretary (PC), DCPC, Govt. of India, New Delhi - Member
10. Director General, Central Institute of Plastics Engg. & Tech. (CIPET) - Member
11. Prof. Anup Ghosh, Professor & Head, Dept. of Mat. Sc. & Engg, IIT Delhi - Member
12. Prof. N N Maldar, Former Vice Chancellor, Solapur University - Member
13. Dr. Smita Mohanty, Director (Pr. Scientist), CIPET:SARP - Bengaluru - Convener

Supported by:.

14. Dr. Aswini Kumar Mohapatra, Manager (Technical), CIPET HO, Chennai
15. Dr. Sandesh Kumar Jain, Principal Director, CIPET:IPT, Lucknow

DETAILS OF THE EXPERT COMMITTEE MEETINGS

S. No	Meeting	Date	Place
1.	1st	01.03.2019	CIPET Head Office, Guindy, Chennai
2.	2nd	22.04.2019	Room No. 307, A Wing, Conference Room, Shastri Bhawan, New Delhi
3.	3rd	09.05.2019	Room No. 218, D Wing, 2nd floor Conference Room, Shastri Bhawan, New Delhi
4.	4th	24.06.2019	CIPET Liaison Office, IPFT Campus, Gurugram
5.	5th & Final	19.09.2019	Central Secretariat Library, I st floor Conference Room, Shastri Bhawan, New Delhi

EXPERT COMMITTEE

Chairman

Shri Indrajit Pal, IAS (Retd.),
Former Secretary (C&PC), GoI

Members : Eminent Scientists and Professors

Padma Shri
Prof. Swaminath Sivaram
(Former Director, NCL - Pune)
Professor & INSA
Sr. Scientist, IISER, Pune

Padma Shri
Dr. R. Vasudevan
Dean ECA & Professor,
Thiagarajar College of Engg. Madurai

Prof. D. D. Kale
Former Professor & Head
Plastics & Paints Department
ICT, Mumbai

Prof. (Dr.) S K Nayak
Director General
CIPET

Prof. A. K. Ghosh
Professor & Head,
Dept. of Materials Science & Engg.
IIT Delhi

Prof. N. N. Maldar
Former Vice Chancellor,
Solapur University

EXPERT COMMITTEE

Members : DCPC

Smt. Aparna Sharma
Jt. Secretary, DCPC

Shri Kashi Nath Jha
Jt. Secretary, DCPC

Members : BIS

Shri. VK Duindi
Sc-F & Head (PCD),
BIS

Shri V. K Gupta
Scientist C (PCD),
BIS

Members : CPCB & MoH & UA (Represented by)

Dr. S K Nigam
Former Addl. Director,
UPC-II, CPCB

Smt. Divya Sinha
Addl. Director, UPC-II
CPCB

Shri V. K. Chaurasia
Joint Adviser
MoH & UA

Convener

Dr. Smita Mohanty
Director (Principal Scientist)
CIPET : SARP - APDDRL, Bengaluru

Supported by : CIPET

Dr. Aswini Kumar Mohapatra
Manager (Technical)
CIPET HO, Chennai

Dr. Sandesh Kumar Jain
Principal Director
CIPET : IPT, Lucknow

Supported by : DCPC

Shri D. Praveen
Director (PC - II),
DCPC

Shri Sanjay K Navahale
Director (PC - II),
DCPC

Shri T P N Singh,
Under Secretary,
DCPC

Glimpses of Expert Committee Meetings

1st Meeting at CIPET HO, Chennai
on 1st March 2019

2nd Meeting at Shastri Bhawan, New Delhi
on 22nd April 2019

3rd Meeting at Shastri Bhawan, New Delhi
on 9th March 2019

4th Meeting CIPET Liaison Office, Gurugram
on 24th June 2019

Meeting by Expert Members at IISER, Pune
on 14th September 2019

5th and Final Meeting at Shastri Bhawan, New Delhi
on 19th September 2019

Presentation by Expert Committee
before Hon'ble Minister of Chemicals & Fertilizers
and Minister of State Shipping (Independent Charge) and
Chemicals & Fertilizers, on 4th Sept. 2019

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Padma Vibhushan
Prof. R.A. Mashelkar (F.R.S.)
(Former Director General - CSIR)
National Research Professor, Pune

Prof. Ashok Misra
(Former Director, IIT - Bombay)
NASI Distinguished Professor,
IISc, Bengaluru

Annexure II

List of Stakeholders

List of Stakeholders

Institutions & Govt. Departments

Ministry of Environment, Forest & Climate Change

Ministry of Housing and Urban Affairs
Government of India

teri
The Energy and Resources Institute

Industry Associations

CPMA
Chemicals & Petrochemicals Manufacturers' Association, India

PLASTINDIA FOUNDATION

FICCI

AIPMA

PSCE

MATERIAL RECYCLING ASSOCIATION OF INDIA
Voice of the Indian Recycling Industry

ICPA

PMMAI
We Shape Plastics...

AILFMA

Stakeholders

IPF

OBPF

"We Care Consortium"

NGOs

Toxics Link

CHINTAN
Environmental Research and Action Group

Annexure III

Presentations / Communications by Stakeholders

Single Use Plastics

CPMA

Presented by
Shri Rajesh Gauba

Presentation by
Chemicals & Petro Chemicals
Manufacturers Association (CPMA)

About CPMA

1. Apex industry forum for petrochemicals covering all large manufacturers in public, private and joint sectors
2. Established in 1993
3. Members from all segments of petrochemical industry
4. Works to promote sustained growth of petrochemical industry
5. Represents India in 7-nation APIC forum as Steering Committee member
6. Work in close liaison with national industry bodies like CII, FICCI, etc.

CPMA Members: Leading Indian cos.

DCW · DCM SHRIRAM · Finolex · LG Chem · MCPI · GAIL (India) Limited · HALDIA PETROCHEMICALS LTD · HMEL · ONGC MRPL · OPaL · Reliance · Indian Oil Corporation Limited · INEOS STYROLUTION · ISRPL · SANMAR · SPL · Tamilnadu Petroproducts Ltd.

MEMBER COMPANY ENGINEERING: EIL (A Navratna Company)

ASSOCIATE MEMBERS: ICIS · INVIYA

Large players in Petchem landscape 2018-19

HMEL adding 1750 KT capacity (LLD, HD and PP) in next 4 years
HPCL-GAIL adding 1090 KT capacity (LLD, PP, PVC) in next 4 years

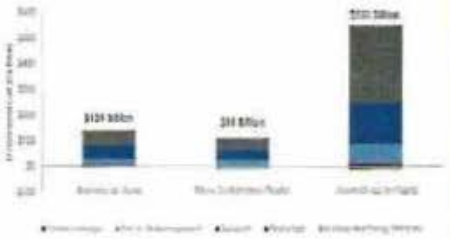
Advantages of Plastics

Attributes contributing to rapid growth

i. Light-weight
ii. Highly durable
iii. Versatile
iv. Low Cost
v. Resistant to moisture and corrosion
vi. Superior properties like Insulation, barrier properties against waster, oxygen etc.
vii. Safe to handle

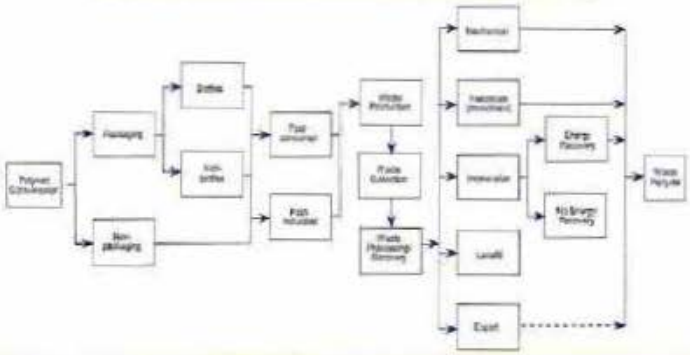
Life Cycle Analysis of Plastics – ACC- Trucost study

1. Alternatives like glass, tin, aluminum and paper for plastics may have a higher environmental cost.
2. By substitution for the same function environmental cost can increase from $139 billion to a total of $533 billion.
3. Environmental cost/kg alternative material is less than that of plastic.
4. On an average 4 times more alternative material is needed (by weight) to perform the same function.
5. Extrapolating to the entire consumer goods sector, over 342 Mt of alternative material would be needed to replace the 84 Mt of plastic used in consumer products and packaging in 2015.



Source : Plastics and Sustainability: A Valuation of Environmental Benefits, Costs and Opportunities for Continuous Improvement, July 2016

Management of plastics waste



TOR 1: To Study the effective implementation of Plastic Waste Management Rules, 2016 and Plastic Waste Management Rules 2018 as updated from time to time by local bodies and Government institutions for segregation of waste and separate materials in order to enable the recycling.

1. MSW rules
   i. Source segregation, transportation of waste as different streams, and decentralized processing of waste.
   ii. Polluters Pay principles
   iii. CPHEEO Manual
2. Earlier PWM rules
   i. 20 Micron – 40 Micron – 50 Micron – Lack of implementation
3. PWM 2016 :
   i. EPR
   ii. Responsibility of ULBs,
   iii. Responsibility of Brand Owners ,Producers and Importers
4. CPCB report on Implementation of PWM 2016
   i. No organized system established by states
   ii. No proper labelling
   iii. No formation of monitoring committee by states
   iv. Ban Issued by many states
5. Response by Industry
   i. Pilots/ Projects
   ii. Registration of PROs

TOR 3: Baseline assessment to identify most problematic plastics as well as action plan to tackle them through regulatory, economic awareness and voluntary actions and to propose an action plan to tackle the problem of use and disposal of single-use plastics.

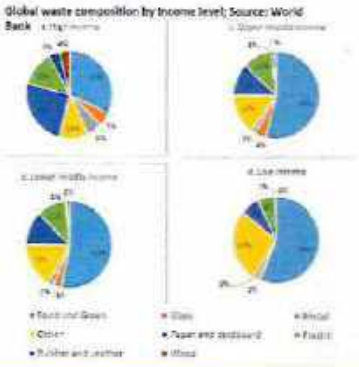
1. Problematic plastics
i. Coastal Cleanup Report 2017 which states 'the most common finds during international coastal cleanups are, in order of magnitude, cigarette butts, plastic beverage bottles, plastic bottle caps, food wrappers, plastic grocery bags, plastic lids, straws and stirrers, glass beverage bottles, other kinds of plastic bags, and foam take-away containers.
ii. India consumes around 14.7 Million ton of plastics and as per CPCB 26000 MTD of plastic waste is generated on daily basis by India which is around 9.5 Million ton. Of this around 60% of waste get recycled by informal sector, which is around 5.7 million ton. This leaves uncollected and littered plastics of around 3.8 million ton mainly comprising of multilayer films, soiled food bags and waste bags which lands up either in dumps or littered.
2. Action plan
i. Plastics products redesign : Minimum weight criterion to make is viable for recycle specially for bags and disposable containers
ii. Awareness and implementation segregation of plastics at source
iii. Plastics recycled : Upgradation of Infrastructure
iv. Plastics Uncollected : EPR for viability Gap - EOL Application, Road, Cement kiln, Waste to fuel
v. Plastics Mixed : Waste to energy – Europe 400+ Plants, China 700+ Plants – Part of MSW
vi. Phasing out : Where EPR & Redesign not possible

TOR 4: Study the steps taken by developed and emerging economies in addressing the issue of single-use of plastics and consider adoption of best practices with customization to the local conditions on the country

1. Key steps by global economies
i. UNEP reports enumerates 10 step process for Policy makers to address issue of plastics waste
ii. EU recommends for more circularity in design with policy measures like EPR, Products redesign, seprate collection mechanism, market restrictions etc.
iii. OECD report focus on creating market for recycled plastics and ensuring basic waste management services for large population.
iv. Japan, Plastics waste management institute focus is on segregation and recycling

2. Adoption of best practices
i. Source segregation
ii. EPR promotion
iii. Organized recycling – Mechanical Recycling technologies
iv. Chemical recycling
v. Waste to energy capacity building (MSW)

TOR 5: To study the composition of municipal waste in order to analyze the plastics products in the dumps.



TOR 6: To define and assess 'single-use plastics' and plastic products after careful assessment of their impact on environment, economy and society with relevance/reference to Indian context.

1. Packaging plastics have multiple uses like storage, transportation, display, hygiene, protection, security and shelf life of product.
2. While defining the single use plastics we have to take into consideration impacts of associated industries specially food packaging, where the food wastage will be multifold and more damaging to environment.
3. So, single use plastics can be defined as
i. Plastics which cannot be recycled or reused after single use like thin plastic bags, thermoformed and foamed containers of low grammage, stirrer, cutlery (fork, spoons and knives), straws
ii. It is not possible to effectively collect through EPR mechanism.
4. While going through any market restriction on these product it should be assessed that more ecofriendly alternatives are available through established Life cycle analysis.
5. In fact UN reports suggest that instead of banning plastics waste management is cheaper alternative.
6. In Indian context we need to take into account existing plastics recycling industry where anything of value get collected and recycled.
i. One of key example in PET bottles where organized recycling capacity is processing the waste generated by society.

TOR 7: To finalize the design and specifications of single use plastics and identify the items included and excluded in the category of single use plastics

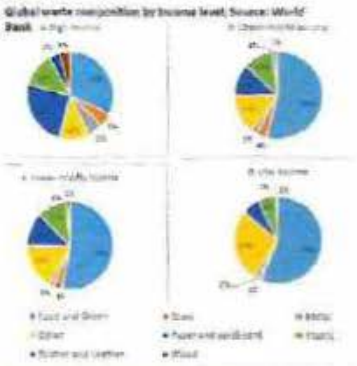
1. Plastics which cannot be recycled or reused after single use
2. It is not possible to effectively collect through EPR mechanism.
3. More environment friendly alternates are available
4. Illustrative list

Thin Plastic Bags	Bags above 20 Gms to ensure recycling	Multilayer films packaging with EPR – Other uses	Milk Packs – Other uses
Low weight thermoformed and foamed disposable	Thermoformed articles above 8 gms to for institutional sales with return and recycling mechanism	Cling film for health and hygiene – Waste To energy	PET bottles
Cutlery items and straw		Packing films and Bubble wraps with EPR - Recycling	
Straws		Medical applications with specific collection mechanism – Hazardous waste	

TOR 8: Analyze the usage of single use plastics in the Indian context and to recommend their usage in other applications keeping in view of local practices

Plastics recycling hubs in India

TOR 5: To study the composition of municipal waste in order to analyze the plastics products in the dumps.



TOR 8: Analyze the usage of single use plastics in the Indian context and to recommend their usage in other applications keeping in view of local practices

TOR 8: Analyze the usage of single use plastics in the Indian context and to recommend their usage in other applications keeping in view of local practices

TOR 9: Consider exclusion of products getting into recycling stream from the definition of single use plastics and also to identify single use plastic items that are deemed essential by their nature or application which cannot be substituted or avoided

1. Exclusion of Products that are already being recycled
i. Currently 60% of Plastic Waste is recycled in India among the highest in the world
ii. Examples of such products: Automotive Parts, Appliance Parts, Water/Soft Drink Bottles, Milk bags etc.
iii. Encourage to enhance recycling rates from the current recycling rates
iv. Improvisation in the collection and segregation process will aid in improving recycling rate in India, thus reducing the products which can be included in the definition of single use plastics

2. Essential Single use plastics by their nature:
i. Plastics going into medical application like syringes, blood bags etc.
• Maintains hygiene, exceptional barrier properties, low weight etc.
• These attributes has made plastic irreplaceable in the medical industry

3. Exclusion as no credible alternates
i. Multilayer Films packaging with EPR – Other uses
ii. Cling film for health and hygiene – Waste To energy
iii. Packing films and Bubble wraps with EPR – Recycling
4. Exclusion to ensure collection & recycling
i. Bags above 20 Gms to ensure recycling
ii. Thermoformed articles above 6 gms to for institutional sales with return and recycling mechanism

TOR 10: To monitor the implementation of 10 steps recommended by UNEP to reduce plastics pollution

1. Implementation of UN 10 step approach for regulation on plastics
2. The 10 steps to consider when introducing bans or levies on single-use plastics
i. Know the base line
ii. Evaluate possible options
iii. Assess the Impact of possible options
iv. Engage Stakeholders
v. Raise Awareness
vi. Promote alternatives
vii. Incentivise Industry
viii. Ring fence Revenues
ix. Enforce
x. Monitor and adjust Policy

Transitioning to more eco-friendly alternatives can be a lengthy process. In the meantime, strengthening circular thinking and waste management systems can successfully help in reducing plastics pollution

TOR 11: To work out and recommend affordable and environmental friendly options with least carbon footprint where single use plastics are banned. .

1. For the shopping bags reusable bags can be used which can even be of thick plastics/ Non woven bags > 20gms
2. Most eco-friendly option is to use the reusable containers wherever hygiene and health issues are not compromised.
3. Cutlery can be steel etc with multiple uses 4. Straws usage should be avoided through public awareness – paper alternates have limited utility

TOR 12: To identify and engage with key stakeholders, including the Central Government, State Governments, Public Sector Undertakings, Industry Associations, NGOs and other related institutions in the whole exercise being undertaken by the Committee

1. MoEF
2. CPCB & SPCBs
3. CPMA, PIF
4. Swach- Pune, Nepra- Ahmedabad, SMS – Mumbai
5. Brands – Pepsi, Coke, Dabur, HLL
6. Processors – Flex, Cosmo, Jindal
7. RAI – Retailers Associations of India

Summary and conclusion

1. Plastics are efficient and environmentally friendly products
2. Plastic waste management need to be augmented in country (MSW infrastructure need to be upgraded)
3. Action plan for managing plastic waste management
   - i. Plastics products redesign :Minimum weight criterion to make is viable for recycle specially for bags and disposable containers
   - ii. Awareness and implementation segregation of plastics at source
   - iii. Plastics recycled : Upgradation of infrastructure
   - iv. Plastics Uncollected : EPR for viability Gap - EOL Application, Road, Cement kiln, Waste to fuel
   - v. Plastics Mixed : Waste to energy – Europe 400+ Plants, China 700+ Plants – Part of MSW
   - vi. Phasing out : Where EPR & Redesign not possible
4. All SUPs does not have more environmentally friendly alternates
5. SUP allowed should be with the EPR obligations (EPR framework with digital backbone is required)
6. Industry and government bodies need to work together to find solution
7. For phasing out any product UNEP 10 steps approach to be followed

Terms of reference	Recommendations
1. To study the effective implementation of Plastic Waste Management Rules. 2016 and Plastic Waste Management Rules 2018 as updated from time to firmed by local bodies and Government institutions for segregation of waste and separate materials in order to enable the recycling.	1. As ordered by the Hon'ble Supreme Court and provided in Solid Waste Management Rules (MSW), 2016, littering of solid waste including plastic waste by the public should be stopped immediately. Strictest action should be taken by the Local Bodies (ULBs). 2. Immediate implementation of Solid Waste and Plastic Waste Management Rules should be implemented in letter and spirit should be carried out, specifically proper labelling, and formation of monitoring committee by states as directed in PWM/SWM 2016. 3. Plastic waste management should be augmented in country with upgradation of MSW infrastructure.
2. Assessment of the impact of ban on various types of plastics by State Governments and other authorities.	4. States should restrict ad-hoc actions of banning various plastic articles. Uniform directions maybe given by the Center after scientific evaluation and considering the economic, social and technological aspects in the country and proper discussion with the stakeholders i.e. after following the 10 step process of UN. 5. Emphasis should be given on plastic waste management instead of banning plastic items.
3. Baseline assessment to identify most problematic plastics as well as action plan to tackle them through regulatory, economic awareness and voluntary actions and to propose an action plan to tackle the problem of use and disposal of single use plastics.	6. Cigarette butts, plastic beverage bottles, plastic bottle caps, food wrappers, plastic grocery bags, plastic lids, straws and stirrers, glass beverage bottles, other kinds of plastic bags, and foam take-away containers are globally the most problematic plastics, so is in India. 7. The action plan to tackle to problem and use of single-use plastics are: i. Massive awareness campaigns for segregation of waste, especially plastics at source, i.e. from the households and bulk generators (like fish and vegetable markets and commercial establishment, pilgrimage places etc. as defined in SWM Rules) needs to be undertaken by both local authorities and brand owners. ii. Training programs maybe initiated at the government level/local authorities for informal sector for further segregating into waste into various categories. iii. To increase the collection and recycling of carry bags and disposable containers, products design criteria based on minimum weight should be notified. iv. Plastic waste disposal in landfills should be banned. Landfill tax maybe introduced in the country. v. Extended Producers Responsibility (EPR) framework should be notified for uniform applicability in the

Terms of reference	Recommendations
	v. Extended Producers Responsibility (EPR) framework should be notified for uniform applicability in the States. EPR incentives should be implemented for safe disposal of non-valid plastics in End of Life (EoL) options like waste to road, waste to cement, waste to fuel, and waste to energy. For mixed Plastics which cannot be collected, Waste to energy option should be considered. vi. Lifecycle analysis studies should be carried out for all alternatives to plastic materials.
4. Study the steps taken by developed and emerging economies in addressing the issue of single use of plastics and consider adoption of best practices with customization to the local conditions of the country.	8. Adoption of best practices from various should be promoted with customization for India, namely, Source segregation, EPR promotion, Organized recycling – Mechanical Recycling technologies, Chemical recycling, Waste to energy capacity building (MSW). 9. The Expert Committee should consider witnessing these practices first hand by visiting these sites at various countries. CPMA can facilitate in this matter.
5. To study the composition of municipal waste in order to analyze the plastics products in the dumps.	10. Per Capita consumption of Plastics in India is still low (11 Kg) as compared to international average of 28 kg while China has 38 kg and USA and Germany has 100 kg, hence sustainable growth in plastic sector could be emphasized.
6. To define and assess 'single use plastic' & plastic products after careful assessment of their impact on environment, economy and society with relevance / reference to Indian context.	11. Only such plastic items which are not collectable, recyclable and cannot be brought under the Extended Producers Responsibility (EPR) ambit should be defined as 'Single Use Plastics' (SUPs). 12. Single-Use Plastics Definition should be consistently followed throughout all States.
7. To finalise the design and specifications of single use plastics and identify the items included and excluded in the category of Single use plastics.	13. Out of these ten items considered internationally, we in India may have the following strategy- i. Milk and oil pouches, PET bottles and other such items should be excluded from the list of items for Single-Use Plastics as they are already collected and recycled. ii. Multi-layered film packaging, cling films for health and hygiene, packaging films & bubble wraps, and plastic in medical applications like syringes and blood bags should also be excluded from the single use plastic list, with the condition of EPR, as there are no available alternative and they can be disposed of in Waste to Energy Plants. iii. Plastics products redesigning should be undertaken based on the minimum weight criterion to make is viable for recycle specially for bags and disposable containers iv. Plastic carry bags maybe standardized as per the

Terms of reference	Recommendations
	weight criteria. Carry bags more than 20 grams (net polymer) may be excluded from the list of SUPs, with the condition of EPR as they can be reused, collected back and recycled. Likewise, thermoformed articles above 6 grams for institutional sales with return and recycling mechanism should be allowed. v. Very thin plastic bags, low weight thermoformed and foamed disposables, cutlery items and stirrers, straws, etc. which is not mentioned above could be included in the list of Single Use Plastics and Government may consider any restriction/phasing out after following the 10 step process suggested by UN.
8. Analyse the usage of single use plastics in the Indian context and to recommend their usage in other applications keeping in view the local practices	14. Plastic Recycling should be given the status of industry and recycling parks should be promoted near large cities. Various fiscal incentives should be given to promote investment in circular economy to improve resource efficiency
9. Consider exclusion of products getting into recycling stream from the definition of single use plastics and also to identify single use plastic items that are deemed essential by their nature or application which cannot be substituted or avoided	15. As discussed above, Milk and oil pouches, PET bottles, Multi layered film packaging, cling films for health and hygiene, packaging films & bubble wraps, and plastic in medical applications like syringes and blood bags should also be excluded as they are essential and cannot be affordably substituted.
10. To monitor the implementation of 10 steps recommended by UNEP to reduce plastics pollution	16. MoEF&CC should implement the 10 steps recommended by UNEP to reduce plastic pollution before taking any decision on single use plastics.
11. To work out and recommend affordable and environmental friendly options with low carbon foot print where single use plastics is banned	17. Plastic waste strategy should be notified after complete baseline analysis, availability of alternatives, and life cycle analysis providing a roadmap for the industry for the next 25 years.
12. To identify and engage with key stakeholders, including the Centre, Government, State Governments, Public Sector Undertakings, Industry Associations, NGOs and others related institutions in the whole exercise being undertaken by the Committee	18. A national institute for plastics and plastic waste recycling should be established which will serve as repository of national and international information.

Single Use Plastics

PLASTINDIA FOUNDATION

Presentation by
Plastindia Foundation

Presented by
Shri S. B. Dangayach

Key Points:

1. Single use is a new phrase for disposable .Even in the report of UNEP, the two terms have been used as synonyms .We therefore think that all products used once and disposed or recycled are to be considered as single use or disposable. Multiple use products are the ones that can be used ordinarily more than once or many times.
2. There are disposable products in many other materials like paper, glass, metal , fabric , composites etc that are also on the rise due to rapid changes in lifestyle , perceptions of hygiene, culture , mobility , aspirations etc. Single use products have to be hence studied together from the angle of waste management system that is the core problem with of all of us in the world.
3. Single use plastic products for medical and hygiene applications are functionally and technically essential and have to be excluded.
4. Single use packaging products of plastics have been selected for a variety of reasons and have to be excluded.
5. Among the single use plastics not related to technical or functional needs ,top list will consist of:
   - Carry bags
   - Water bottles
   - Ice cream cups
   - Plates. saucers ,spoons ,forks etc
   - Styrofoam cutlery items as mentioned above
   - Cigarette butts
   - Straws

Above products in plastics have gained popularity for reasons of being hygienic ,convenient , labour saving ,cost effective and accessible for masses .Their ubiquitous acceptance shows great utility that they provide for the current living conditions and standards

6. UNEP is fully aware about complex issues and have hence suggested 10 point roadmap before going for ban .Consumer or citizen of the country is to be kept in mind and hence consultation with concerned stakeholders is definitely needed to avoid distortions including corrupt practices.

7. Solid waste management rules , 2016 is an overarching legislation defining all aspects .There is great thrust on segregation of waste into dry, wet and hazardous along with penalty provision for littering .There is also emphasis on discharge of responsibilities by waste generators ,local governments and others.

   It is however seen that implementation is very difficult despite massive efforts by government. Similar implementation challenges are being seen in EPR, PRO and plastic waste management rules.

   We feel that before enacting new rules or acts, it will be worthwhile implementing extant laws

8. It is necessary that consumers, designers, producers etc are consulted to look at the alternatives holistically and tested in select areas before large scale adoption.

9. Many nations with strong regulatory framework have also found that ban is counterproductive most of the times and have hence been commending a wholesome mix of incentive, penalties, awareness programme etc. In our country with porous and leaky implementation machinery, we may face a lot more problems.

10. Impact of the ban has to be also assessed from angle of job creation ,investment , trade , exports , hygiene ,health ,convenience ,economics etc .Environment has to be balanced with energy , resource availability and above all economy to achieve holistic development

In view of the above we request you to go for wider consultation and calibrated action in consonance with our aspirations and goals

Single Use Plastics

Presented by
Shri Prabh Das

Presentation by
Federation of Indian Chamber
of Commerce and Industry (FICCI)

Plastics – A Poor Man's Material

- Plastic Industry - A Vehicle for Economic & Employment Growth
- Comprises of over 40,000 processing units in India.
- Most of Units are in Micro Small & Medium Enterprises (MSME) sector.
- Provides Employment & Livelihood to ~4 million families in India.
- A Non-Polluting Industry

Plastics – A Catalyst for Growth

- Plastics have outpaced all other materials by virtue of the following superior and valuable properties:
  - Safe & Hygienic
  - Inert & Chemical Resistance
  - Light-weight
  - Durable & Versatile
  - Resistant to corrosion
  - Excellent barrier properties against water, oxygen
  - Cost Economic compared to alternate materials

→ Poor Man's substitute to high cost alternatives

- Growth of Plastic Consumption in India @1.5 times GDP
- Per capita plastic consumption in India still is much lower than in many parts of the developed world.

Single Use Plastics - Definition

- Defining Single Use Plastics (SUP) - Criteria
  - Plastics which cannot be recycled or reused after single use
  - It is not possible to effectively collect.
  - Plastics where no practical alternative is available, shall remain out of Single-Use categorization; **e.g.** Medical Disposable products.
- Clarity in Definition & Notification of SUP
  - The identification of product for single use plastic should be in details with specifications, to rule out any ambiguity. E.g. Use of Carry Bags/ Disposable Thermoformed Products below a specified thickness/weight.
  - **Uniform & Unambiguous definition be notified, applicable throughout the Country, to facilitate free movement of approved materials across the States.**

Single Use Plastics - Scope and Timelines

United Nation Environment Assembly (UNEA), Nairobi, 15th March 2019.

"Delegates commit to significantly reduce single-use plastic products by 2030".

"Encourages member states to take actions, as appropriate, to promote the identification and development of environmentally friendly alternatives to single-use plastic products, taking into account the full life cycle implications of those alternatives".

For the products identified for phase-out, sufficient time shall be provided to Units and employed population for arranging alternate source of livelihood.

Responsibility of Plastic Waste Management

- Primary Responsibility of PWM lies with Urban Local Bodies & Gram Panchayats
- **India has vast network of ~3200 Municipal Bodies & ~2.5 lakh Gram Panchayats.**
- PWM Rules 2016 - The local body shall be responsible for setting up, operationalization and co-ordination of the waste management system and for performing the associated functions, namely: -
  - ensuring segregation, collection, storage, transportation, processing and disposal of plastic waste;
  - ensuring that no damage is caused to the environment during this process;
  - ensuring channelization of recyclable plastic waste fraction to recyclers;
  - ensuring processing and disposal on non-recyclable fraction of plastic waste in accordance with the guidelines issued by the Central Pollution Control Board;
  - creating awareness among all stake holders about their responsibilities;
  - engaging civil societies or groups working with waste pickers; and
  - ensuring that open burning of plastic waste does not take place.

Biggest issue is "Plastic Waste Management"

Responsibility of PWM: CPCB Guidelines 2017

S NO.	ACTIVITY	RESPONSIBLE AGENCIES
1	Door to door collection and segregation of all category of plastic waste	Safai Karamchari (Municipal Staff) or Authorized Waste Collector/Picker
2	Collection of littered/dumped plastic waste in public places like market areas, bus stands, railway stations, cinema halls, parks, community centers, road side etc.	
3	Storage of collected plastic waste from households and other places in a covered yard authorized by Municipal Authority.	Municipal Staff or Authorized Agency or NGO
4	Segregation of stored plastic waste and shredding into 2-4 mm size using plastic shredder.	
5	Storage of shredded plastic waste in bags and utilization in different technologies as per requirement and infrastructure.	

PWM – Plastic Industry Support

- Industry fully supports the Govt. initiatives for proper Plastic Waste Management.
- EPR mechanism is one option of Industry support, which is good for Western countries.
- We need to understand the suitable mechanism for India, as our realities and requirements are different from Western countries:
  - Waste collection & segregation in India is highly unorganized.
  - Demographic diversity and economic conditions in India are very different.
  - Littering habits in India are very different.
- Industry with dominant participation of MSMEs has little know how and competence for EPR.
- Suitability & Adequacy of EPR mechanism through PROs (18 Nos.), cannot match the extensive network of Municipalities and Gram Panchayats.
- Suitable mechanism to be formulated for funding these Govt. bodies.

Recommendations

- Municipalities and Gram Panchayats shall hold the principle responsibility for Plastic Waste Management.
- Suitable mechanism shall be formulated for funding these Bodies.
- Technological and Scale Up-gradation of Plastic Waste Management infrastructure in the Organised and Unorganised sector.
- Uniform & Unambiguous definition of Single Use Plastics be notified, applicable throughout the Country.
- Identification of Single Use Plastic, after taking into account the full life cycle implications of the alternatives (as per recommended by UNEA).
- Raising general public awareness for at-source segregation and collection of waste and against the littering.
- For the products identified for phase-out, sufficient time shall be provided to Units, in line with UN 2030 Agenda for Sustainable Development.

Single Use Plastics

Presented by
Shri Hiten Bheda

Presentation by All India Plastic Manufacturers Association (AIPMA)

About AIPMA

- 73 year old not-for-profit, industry association
- Works for development of plastic sector in India by partnering with Industry and Government
- Pan India presence with head office in Mumbai with 4 zonal offices in New Delhi, Chennai, Kolkata and Ahmedabad.
2000 plus direct members and 20000 affiliated members.
- Represents all segments of Plastic Industry Processors, Raw Material manufacturers, Machinery, Molds and Dies, Traders,
Consultants and Technical professionals • Network with 106 Plastics Associations across India to address issues of Plastic Industry and take Plastics Image building initiatives industry-led and industry-managed initiatives.

The Journey of India's Plastic Industry

- The Indian plastics industry made a promising beginning in 1957 with the production of polystyrene.
- Sixties and Seventies saw significant progress and the industry has grown and diversified rapidly.
- The industry spans the country and hosts around 50,000 processing units, over 2,000 exporters and employs about 4 million people across value chain.
- 85-90 of these units are small and medium - sized enterprises employing bulk of human resources.

Present Status

- Current Industry Size - Rs. 100,000 Cr Industry with 13.4 MMTPA growing @ 10.5% (CAGR) to reach 22 MMTPA by 2020.
- Strength of Industry - Active 50,000 Processors, 7500 Recyclers
- Means of Disposal - 60% plastic is recycled, need to effectively dispose balance.
- One of the fastest growing industries in the Indian economy.

The Issue on hand

Is plastic the problem
or
Is it plastic pollution Eye sore in the environment
Plastics in the Ocean
Plastics in the landfill

Perception

USA

INDIA

"Single-Use' Is The 2018 Word Of The Year, according to Collins Dictionary"

- The English-speaking world's growing concern for the environment and the ubiquity of disposable items that are used only once has pushed the word single-use" to the top of Collins Dictionary's list of "Word of the Year."
- Collins says there's been a fourfold increase in the usage of the word since 2013, in part thanks to news coverage of environmental issues.

Single use plastics

- **(According to UN Environment Report)**

often also referred to as disposable plastics, are commonly used for plastic packaging and include items intended to be used only once before they are thrown away or recycled. These include, among other items, grocery bags, food packaging, bottles, straws, containers, cups and cutlery.

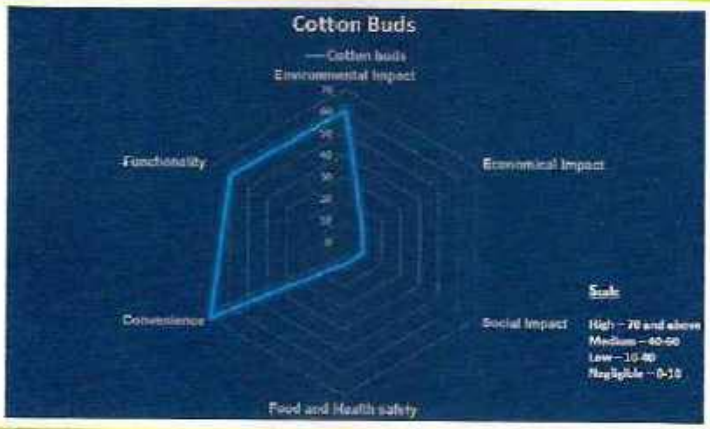
- **Copying blindly the UN report, will only hamper Indian plastic industry and economy adversely.**
- A proper definition and collation of plastics need to be done by MoEF&CC / DCPC.

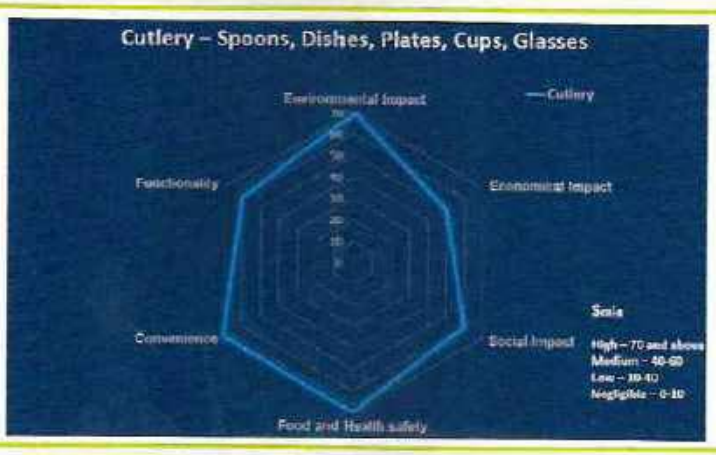
Significance of a product

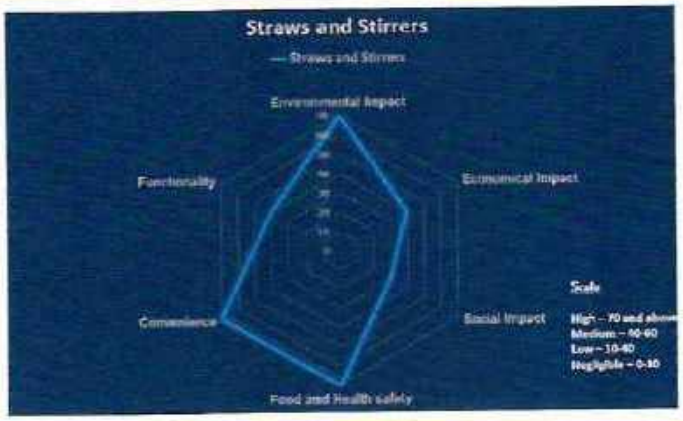
- Functionality
- Convenience
- Food safety
- Health safety
- Environmental impact LCA/EIA
- Social Impact
- Economical impact /Resource Efficiency
- Consumer Preference
- Carbon footprint

What really matters

- Consumer Behaviour
- Convenience
- Affordability
- Small Sizes



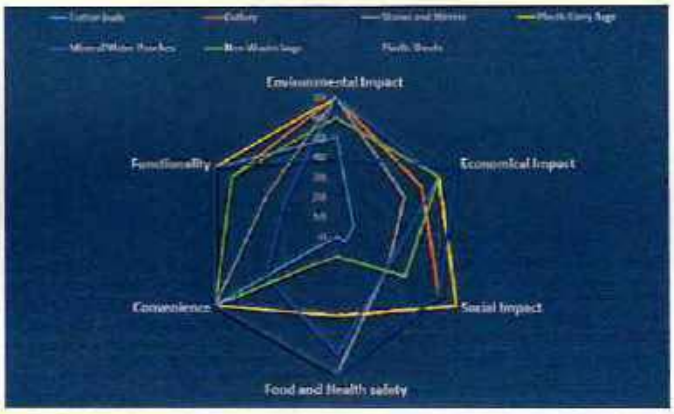



Straws and Stirrers
Straws and Stirrers
Environmental Impact
Economical Impact
Social Impact
Food and Health safety
Convenience
Functionality
Scale
High – 70 and above
Medium – 40-60
Low – 10-40
Negligible – 0-10


Plastic Carry Bags < 50 microns (<20gms)
Plastic Carry Bags
Environmental Impact
Economical Impact
Social Impact
Food and Health safety
Convenience
Functionality
Scale
High – 70 and above
Medium – 40-60
Low – 10-40
Negligible – 0-10


Mineral Water Pouches
Mineral Water Pouches
Environmental Impact
Economical Impact
Social Impact
Food and Health safety
Convenience
Functionality
Scale
High – 70 and above
Medium – 40-60
Low – 10-40
Negligible – 0-10


Non-woven bags (with or w/o handles)
Non Woven bags
Environmental Impact
Economical Impact
Social Impact
Food and Health safety
Convenience
Functionality
Scale
High – 70 and above
Medium – 40-60
Low – 10-40
Negligible – 0-10



Aggressive stand on Bubble wrap

- Flexible packaging material which wraps around the product of intricate shape and it gives the best cushion protection from damage.

Multi segment applications

Statistics

- No of units in India 70
- Material Converted 40-50,000 M tons
- Employment directly 1500-2000

indirect >3000

Turnover >500 CR

Revenue for state 100 CR

PWM Rules, 2016 and Amendment Rules 2018

- PWM - The responsibility of a producer for the environmentally sound management of the product until the end of its life
- Objective : To give thrust on plastic waste minimization, source segregation, recycling, involving waste pickers, recyclers and waste processors in collection of plastic waste fraction either from household or any other source of its generation or intermediate material recovery facility and adopt polluter's pay principle for the sustainability of the waste management system.
- Plastic sheet or like, which is not an integral part of multi
made of plastic sheet used for packaging, wrapping the commodity shall not be less than fifty microns in thickness except where the thickness of such plastic sheets impair the functionality of the product.
- A Value chain for non recyclable plastics is to be established. As per CPCB Consolidated Guidelines for collection, segregation and disposal of plastic waste the sustainable Methods have been prescribed for non recyclable plastics.

Plastic Waste Management Notification 2016 and 2018 do not consider general ban on plastic packaging

GDP Growth : Strong Relation to Petrochemical Growth

Year	GDP Growth	Polymer Consumption Growth	Import Duty
1990-1995	5.0%	12.9%	50%+
1995-2000	6.5%	14.6%	40%
2000-2004	5.9%	5.8%	45%-15%
2005-2012	8.7%	10.9%	12.5%-5%
2012-2017 12th plan	7.2%	10.6%	7.5%-5%
2017-2022 13th plan	8%	10.4%	5%-0%

Upshot

- If plastic waste is not treated, make 5 years plan for collection/ segregation and disposal
- Urban Local Bodies have to come out with collection and segregation plan of plastic waste with the help of involved stakeholders and associations.
- Association will be willing to work with Government
- AIPMA recommends yearly increase in collection / segregation as follow :
- 2020 - 20%
- 2022 - 50%
- 2024 - 80%
- 2026 - 100%

Opportunity with Plasticulture

- Following are the opportunities that the agriculture sector has with enhanced usage of Plasticulture applications:
  - Yield improvement upto 50-60%
  - Water savings upto 60-70%
  - Prevention of weeds growth
  - Soil conservation
  - Protection against adverse climatic conditions
  - Fertilizer savings upto 30-40%
  - Reduction in post-harvest losses
  - Conversion - cold desert/wasteland for productive use
- The greater use of plastic in agriculture can also help to a great extent to achieve up to fifty percent of the intended targets in Agriculture.

EoL solution

The following are the End of Life solutions for plastics:

- Converting Plastic Waste into Polyfuel which is a high calorie fuel which is an alternative to Kerosene
- Converting Plastic Waste into fertilizer which increases the yielding capability of crops
- Converting Plastics into Electricity which is a good option for our country with scarcity of electricity
- Plastic waste added to bitumen in road construction has proved to extend life of road and improve quality
- Using Plastic Waste as additive to furnaces in cement kiln and power plants should be mandated
- If mandated and implemented properly there will be a huge demand for plastic waste and improve recycling industry

Global Scenario

SUMMARY OF COUNTRIES THAT HAVE INTRODUCED REGULATIONS ON PLASTIC BAGS AND STYROFOAM PRODUCTS

BAN - ENTERED INTO FORCE	Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Cote d Ivoire, East Africa, Egypt, Eritrea, Ethiopia, Gambia, Guinea-Bissau, Kenya, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Rwanda, Senegal, Somalia, Tanzania, Uganda, Bangladesh, Bhutan, India, Mongolia, Myanmar, Pakistan, Philippines, Sri Lanka, Antigua and Barbuda, Argentina, Belize, Chile, Ecuador, Guatemala, Guyana, Haiti, Honduras, Panama, St. Vincent and the Grenadines, France, Canada, Australia, Papua New Guinea, Vanuatu, Mrshall Islands, Palau,
LEVY - ENTERED INTO FORCE	Botswana, Indonesia, Taiwan, Vietnam, Brazil, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Greece, Ireland, Latvia, Lithuania, Malta, Netherlands, Portugal, Romania, Slovakia, Sweden, United Kingdom, Fiji
BAN & LEVY - ENTERED INTO FORCE	South Africa, Tunisia, Zimbabwe, China, Israel, Malaysia, Colombia, Mexico, Belgium, Italy, Spain, United States of America

National level plastic bag bans and Styrofoam regulations

Ban and its impact in India

City	Ban on Plastic Products	Impact
Himachal Pradesh	Non-biodegradable plastic bags and disposable plastic products	Significant decrease in plastic pollution
Karnataka	Plastic bags	Plastic bags continue to be both available and commonly used
Punjab	Single-use plastic carry bags and containers	
Haryana	Plastic carry bags	Limited because of poor enforcement
Kerala	Plastic bags <50µ	
West Bengal	Plastic bags <40µ and blanket ban in certain areas	Plastic bags are still commonly used. Implementation is limited
Sikkim	Plastic wrappers, plastic bags and disposable Styrofoam	Although plastic bags are still common (used by 24% of shops) the majority switched to paper bags or newspaper (40%)
Delhi	Ban on all kinds of disposable plastics	Limited because of poor enforcement
Maharashtra	Plastic carry bags, PET bottle (less than 200 ml), Disposable items, Decoration item	

Case Studies

IRELAND

- **Action taken** - In 2002 - Introduced a tax on plastic bags at points of sale, known as the "Plastax". The levy was set six times higher than the estimated willingness to pay. Aim to trigger behaviour change in consumers. Tax did not apply to small so-called litrot bags for hygiene purposes.
- **Impact** - Within one year from the introduction of the tax, the use of plastic bags in Ireland dropped by more than 90%. Likewise, while prior to the 2002 levy, plastic bags accounted for 5% of the national waste, in 2004 this number fell to 0.22%, with a strong perception among surveyed households of the positive effects of the levy on the environment.
- **Learnings** - The success of the Irish levy on plastic bags demonstrates that the adoption of a sufficiently high levy can influence consumer behaviour. Furthermore, it proves that stakeholder buy-in and wider public acceptance are essential for the successful implementation of such a policy tool. Extensive consultation and awareness campaigns on the environmental impacts of plastic bag litter were of utmost importance. Clear division of roles and responsibilities among local authorities were key for good governance and, regular monitoring and review of the tax ensured its continued effectiveness.

Case Studies

South Africa

- **Action Taken** - In 2003, the Government of South Africa introduced a ban on single use plastic bags less than 30 microns thick. The new regulation was combined with a nominal levy on retailers. After only three months the levy was reduced to partly because of the pressures from plastic-bag producers.
- **What didn't work so well**

The levy on plastic bags affected the food sector but excluded other industries, such as clothing retailers, which still give out free plastic bags. The levy on plastic bags seemed to be particularly problematic for poorer segments of the population, which use plastic bags as cheap means to carry goods over long distances. Despite the initial success, with little to no consultation with stakeholders and no awareness raising on why the levy was being implemented, consumers started to budget the small charge for plastic bags into their shopping, and the number of bags consumed slowly returned to pre-levy levels.

- **Lessons learned**

The mix of policy tools implemented in South Africa, albeit initially successful in reducing the demand for plastic bags, had diminishing effects over the longer term due to limited consultations with and awareness of the stakeholders. The (too) small nominal levy on retailers did not prompt the desired change in consumers' behaviour, suggesting that people have become habituated to paying for plastic bags. It remains unclear if any part of the revenues collected from the levy are utilized for the benefit of the local waste and recycling sector.

EU PROPOSALS

- **Plastic ban of certain products:** Where alternatives are readily available and affordable, single-use plastic products could be banned from the market. The ban could be applied to plastic cotton buds, cutlery, plates, straws, and drink stirrers which would all have to be made environmentally from more sustainable materials instead. Single-use drinks containers made with plastic could only be allowed on the market if their caps and lids remain attached.
- **Consumption reduction targets:** States would reduce the use of plastic food containers and drinks cups. They can do so by setting the reduction targets, making reusable products available at the point of sale, or ensuring that single-use plastic products cannot be provided free of charge.
- **Obligations for producers:** Producers would help cover the costs of waste management and clean-up, as well as awareness raising measures for food containers, packets and wrappers (such as for crisps and sweets), drinks containers and cups, and lightweight plastic bags. The industry could also be given incentives to develop less polluting alternatives for these products.
- **Collection targets:** States could be obliged to collect 90% of single use plastic wastes by 2025, for example through deposit refund schemes.
- **Labelling Requirements:** Certain products would require a clear and standardized labelling which indicates how waste should be disposed, the negative environmental impact of the product, and the presence of plastics in the products.
- **Awareness-raising measures:** States could be obliged to raise consumers' awareness about the negative impact of littering of single use plastics as well as about the available re-use systems and waste management options for all these products.

In Conclusion

- The industry is aligned towards Environment protection.
- Phasing out and Banning of specific products/ group of products should be considered only after due process to understand 360 degree view.
- Emphasis should be on practical execution towards solution.
- Stake holders across value chain have to contribute towards successful implementation.

Plastic Serves
Littering Pollutes
Segregate the waste
Bless Plastics
Ban Littering

thank you!

Single Use Plastics

Presented by
Shri S. K. Ray

Presentation by
Indian Centre for Plastics in the Environment (ICPE)

Multi-Stakeholders' Consultation

Plastic Packaging & "Single Use Plastics"

held on Thursday, The 04th April, 2019, New Delhi

Coverage – Representative Few

Consumer / NGO / Activist (8)	• Consumer Guidance Society • Ocean Foundation – Afroj Shah • Indian Pollution Control Association • Almitra Patel
User Industry / Brand Owners (5)	• Amul • Coca Cola • Nestle • HUL • ITC
Plastic Industry & Associations (8)	• Essel Propack • Uflex • Premier Polyfilm • CPPI, AIPMA, GSPMA, Flexpack
Academic (2)	• IIT-Delhi, IIP, CIPET
Raw Material Producers (4)	• RIL, GAIL, HMEL
Government / Regulators (5)	• MoEF&CC • UNDP • MHUD • Drinking Water & Sanitation • BIS

~ 63 participants representing wide range of stake-holders

Points For Deliberation

- What constitutes "Single Use Plastics" (SUP).
- Impact of SUP phase out on stakeholders – users, brand owners, retailers, consumers and industry.
- Alternatives to SUP – technical feasibility, environmental footprints & economic viability.
- Innovation opportunities in materials, package design for promoting recycling and waste management.
- Role of stake holders in addressing plastic waste challenge

Synopsis of Proceedings

- Plastics critical in supplementing and complimenting natural resources, saving energy, reducing losses and hence, current tirade against it may be misplaced.
- While acknowledging the benefits of plastic, mis-managed waste is to be accepted as a major global concern.
- All stakeholders, including consumers, have to take responsibility.
- Banning a product generally is not advisable unless it proves to be a major hazard.
- UN guidelines recommends developing viable alternatives before phasing out any single use plastic products.

Synopsis (.. Contd 1.)

- To ban a product only because we cannot handle waste properly, is like "throwing away baby with bathwater".
- Two critical principles that may be considered while tackling plastic waste problem:
  - Need to set up efficient and effective solid waste management policy and infrastructure with viability gap funding through EPR.
  - Support upgradation and rejuvenation of the recycling industry.
- In working out EPR, general view was that all the participants in the value chain should participate, though their individual share may differ.

Synopsis (.. Contd. 2.)

- In light of the above broad principles, following specific issues arose during discussions:
  - Few recent notifications from some State Governments have created confusion leading to harassment of trade and consumers.
  - There are some plastic products which cannot be phased out in the absence of viable alternatives. Milk pouch is an example. Replacement with glass is expensive, energy intensive and water guzzling. Bulk vending is impractical on pan India basis.
  - Plastics films used for wrapping of food products increase shelf life (an important criterion for tropical country like India) and prevent wastages.

Synopsis (.. Contd.3)

- Plastic is critical in several drug delivery systems. Such products cannot be replaced at this juncture as there are no viable alternatives.
- Entire retail industry is critically dependent on plastics. These cannot be phased out as SUPs without hurting economy. Attempt should be made to promote "buyback" and recycling, rather than phasing out.
- A broad consensus emerged on phasing out " **Thin**" Carry bags even-though alternatives like paper / cotton bags will increase environmental footprints.
- May be wiser to strictly enforce ban on carry bags of less than 50 microns or weighing less than 20 grams / each rather than blanket ban on all carry bags.
- MLP offers one of the most cost effective solution for preservation of food and other packed consumer items.

Synopsis (.. Contd.4)

- The very small size pouches, sachets etc. from MLP are difficult to collect even if the producers agree to "buy back". Restriction, similar to carry bag size / weight, on MLP may be explored to help collection of waste.
- "Multi-material" MLPs are difficult to recycle. We should promote "films from same / similar family of material" for packaging. This would promote recycling which should be an important criterion for material selection.
- There is an urgent need to stop unnecessary and avoidable packaging like invitation card overwraps.
- Vigorous awareness program on PPP model promoting anti-littering, segregation and proper handling of waste as part of "Swachh Bharat" mission.

Synopsis (.. Contd.5)

- SUPs should be identified in Indian context. Following any western model could be counter-productive.
- Unlike western countries, delivery of safe drinking water is major concern in India. Use of PET bottles is the best means of delivering safe drinking water to consumers. With the development of post consumer PET bottle recycling, there is hardly any presence of PET bottles in MSW stream.
- Societal change, Awareness, Waste Management Infrastructure, Research on materials & innovation in packaging by Brand Owners , these plans can be announced by public- private responsibilities as country moves ahead.

- Given the array of issues, in many cases lack of viable alternatives; perhaps advisable to defer the time line for phasing out SUPs.

Observations on SUP

- Most common SUPs found in environment in the west are (in order of magnitude): cigarette butts, drink bottles, caps, food wrappers, grocery bags, lids, straws, stirrers and foam take-away containers.
- In Indian context these are less visible in waste stream.
- Plastic drink bottle are mostly collected & recycled (~85% recycled).
- Categorize SUP based on littering intensity & collection difficulties.
- Recommendation from UN – phase out SUPs after there are viable alternatives in place. Time line 2030.
- Robust infrastructure and extensive awareness campaign will reduce leakage of plastic waste into environment.

Concluding Submission

- Categorize SUPs in Indian context based on littering intensity, degree of utility & collection difficulties
- **Focus on waste management infrastructure.**
- **Invest in awareness: anti-littering & source segregation.**
- Finding technical solutions are easier. Challenges lie in achieving behavioural changes.
- Promote, support recycling, "end-of-life" applications.
- Review / Reflect on SUP phase-out plan.

Picture Gallery

Single Use Plastics


Presentation by
Pet Packaging Association of
Clean Environment (PACE)

Presented by
Dr. Vijay G. Habbu Shri Chandramohan Gupta

PACE represents the whole PET value chain – From Resin to Recycling

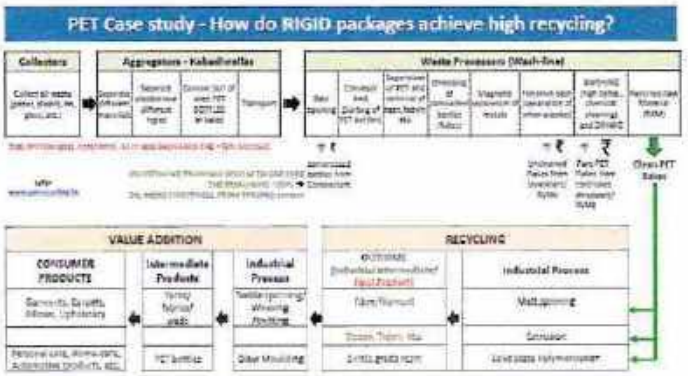
Deliberations on Single Use Plastics
DCPC, Shastri Bhawan, New Delhi
8th May 2023

Our membership represents 28 businesses who contribute immensely to the development of Indian plastic packaging ecosystem

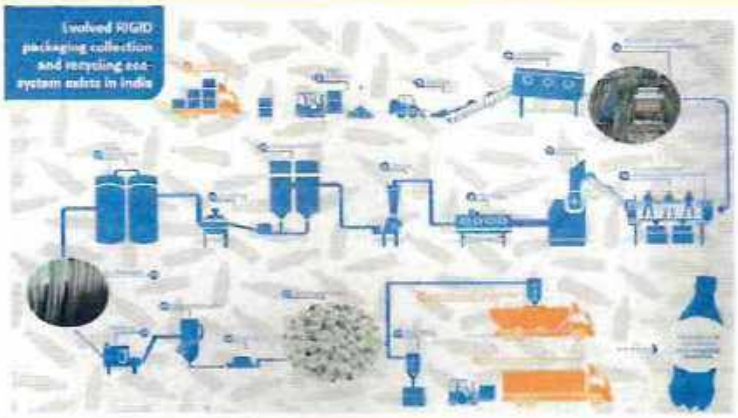
Bisleri, Coca-Cola, ASB, Sidel, DIAGEO, KHS, HUSKY, PEPSICO, Manjushree, ALPLA, Dabur, INDORAMA VENTURES, HCCB, Reliance, SC Johnson, CavinKare, GEEL, CHEMCO

Plastics are not a MONOLOTHIC group – Each category needs a different Environmental outlook

Plastic Based Articles		Examples	
Category	Complexity	Packaging	Non-packaging
		Food, Water, Personal Care, Beverages, Pharmaceuticals	Personal Hygiene, Household Utilities, Industrial/Other articles
RIGID	Single Polymer	Bottles, Drums	Combs, Crocker, Pipes, large articles (Tanks, Furniture)
	MLP Type 1 – Multi-Polymer	Food packets (Unsupported)	Frames, Cutler, Marker Pens, Bangles, Tooth Brushes, White Goods
	MLP Type 2 – Multi-Material	Blister / Metalized packaging, Brick Cartons (Supported)	Footwear, Razors, Automobile Components
FLEXIBLE	Single Polymer	Milk Pouches, Carry Bags, Envelope Covers, Wrappers	Fishing Nets, Farm Implants, Pipes, Ropes, Dental Floss, Tapes
	MLP Type 1 – Multi-Polymer	Toothpaste/Ointment Tubes	Wires, Cables
	MLP Type 2 – Multi-Material	Wafer Packets, Pouches, Shampoo Sachets	Toys, Printed Circuits, Connectors


PET Case study - How do RIGID packages achieve high recycling?
Collectors
Aggregators - Kabadiwallas
Waste Processors (Wash-Line)
VALUE ADDITION
CONSUMER PRODUCTS
Intermediate Products
Industrial Process
RECYCLING
Industrial Process


On-ground: Our understanding of EPR principles suggest that packages which are collected for safe re-purposing should be treated differentially
Used RIGID packaging in India is estimated to be recycled to +85% by a well established and efficient local collection & recycling network
Please refer to the NCL report available on PACE website


Evolved RIGID packaging collection and recycling eco-system exists in India


Much of the used plastic goes into production of industrial feedstock
Post Consumer Plastic
PP/PE to Granules
PET to Flakes

End-of- life solutions can be the next big emerging plastic economy for India and show the world of how to better manage plastics...

IPL Indian team

World Cup jerseys from PET recycled fiber

Emirates launches blankets made of recycled plastic bottles

To further strengthen the Rigid plastic circular economy, we request for enabling policy changes – Compulsorily 25% recycled content in all rigid packaging

(PROPOSED) DEFINTION OF SINGLE-USE PLASTICS

"Single Use Plastics are those which after their first use cannot be reused safely nor are recycled and escape the EPR obligations"

To be read and understood as:

Single use plastics are those, which after their first use

- *cannot be reused safely*
- *nor are recycled and*
- *escape the EPR obligations*

This proposed definition is broad-based, rational and addresses the various realities of INDIA

PACE

THANK YOU

For any clarifications, please contact
Mr. Pankaj Uppal – Senior Manager
LL: +91 11-43528729, Mobile No: +91 9599356382, E-mail: consultant@paceindia.org.in

Single Use Plastics

Pro India Recycling

Presentation by
Pro India Recycling

Presented by
Shri Amit Saha

What is single use plastics :our definition

- Almost every consumer food is packaged for retailing is technically single used
- PET bottle containing beverage or Shampoo bottle are all Single Use in the technical sense - SHOULD THEY BE BANNED TOO
- The purpose of building the Single Use plastics List should be to
  - ENSURE THAT PLASTICS THAT CANNOT BE REMOVED FROM ENVIRONMENT IS NOT PUT INTO ENVIRONMENT
  - THOSE ITEMS OR PACKAGING WHICH ARE NOT ESSENTIALLY NEEDED BY THE CITIZEN AND WHERE EQUALLY GOOD ALTERNATES ARE AVAILABLE FOR THE INDUSTRY
  - THAT THE SAME PRODUCER UNDERTAKES RESPONSIBILITY TO CREATE CIRCULAR ECONOMY FOR THOSE PLASTICS PUT OUT BY THEM TOWARDS 100%.

What are the types of plastics that cannot be removed from Environment

- The smallest of the plastics which are very light and un economical to PULL BACK
- Criterion for such plastics could be
  - Cost per UNIT pack by manufacturer - Eg 50P toffee wrapper could be of 1P
    - Eg 200 PET bottle picked by waste picker at 30P vs toffee wrapper at 1 P
  - Pack Recyclability which can be certified by BIS / FSSAI
    - Eg 0% pack recyclability for MLP pouch and Tubes
    - Eg 90% pack recyclability for PET (as label is MLP + effort needed for cap and ring removal)
  - Current Recycling Rates of Categories of packaging that is certified by TERI/CPCB
    - PET /HDPE bottles may have high recycling rates of 70% - but should be taken up to 90%
    - Bubble & Stretch Film may have high recycling rates but not recycled due to no recycling infrastructure

Example of over all recyclability

Sl.No	Item	Cost Per Unit	Would Waste Picker Pick it	Pack Recyclability	Current Recycling Rate	How much would it stay in the environment	Should it be considered for Single Use
1	Toffee Wrapper	1P	NO (less than 20 P)	70% (single polymer material)	0%	100%	YES
2	MLP Pouch (2 50gm product)	2 P	NO (less than 20 P)	0% (no technology available)	0%	100%	YES
3	Single plastics pouch (dry goods)	25 P	Yes (attractive to WP)	90% (single polymer material	60%	40-45%	NO
4	PET Bottle >200ml	40P	YES (attractive to WP)	90% / 10% MLP label)	70%	20-30%	NO
5	Tubes	10P	NO	10% (due to aluminum)	30%	70-80%	MAYBE

Calculation for over all recyclability - Rating SCALE

Cost Per Unit	Would Waste Picker Pick ? Certified by MOUD / MSKFDC	Pack Recyclability Certified by BIS / FSSAI	Current Recycling Rate Certified by CPCB/TERI	How much virgin is used in the manufacturing
As country current waste management is unprepared & not door to door - dependence is on the Waste Pickers to PICK	Bigger Brown / packages and hard plastics of mono-material is recycled by informal markets	Standard survey should be conducted to find such packages in landfills	This would be the estimation by considering Cost per Unit (scale 1-10	
At Rs100 per day (bulk wages) each pick should be >10	Ease of separating the package into separate plastics - mechanically & Chemically	Packages to be categorized into generic categories	Pack Recyclability (P) scale 1-10	
Waste Picker would PICK only if the RETURN > EFFORT.	Packages can be characterized on scale of 1-10 for its recyclability	Eg PET bottles, Tubes , Food /MLP packs , milk /MLP pouch etc	Current Recycling Rate (R) scale 1-10	
Scale 1-10 with 1 being unproductive for Waste Picker & 10 being highest value for WP	Scale 1-10 with 1 being nearly non recyclable	Scale 1-10 with 1 equal to 10% recycling rate	C X P X R = CPR	

Recommendations :

- Anything with less than 20% CPR should be phased out
- Items between 21-40 % - Industry should be given time to improve one or more CPR parameters by
  - Increasing WP incentives to pick the pack
  - Increase recyclability (change id design of packaging)
  - Setting up Recycling centers /hubs to improve Recycling Rates
- Items between 41- 70 % -Industry should participate towards improvement CPR by
  - Participating in Awareness & Execution of waste & plastics segregation
  - Participate in over livelihood programs for Waste Pickers
  - Industries should be allowed to use CSR budgets for the same

Recommendations given to NITI Aayog
PLASTICS RECYCLING TECHNOLOGY

- Some difficult to recycle plastics are left alone in on land and let into the water bodies. These are light plastics composites (multi-layered / multi material etc) which have only option of controlled incineration (waste to energy) in cement plants as AFR and Waste to Energy plants attached to landfills.
- Plastics to fuel is a great and proven technology and available now in Europe and China. It should be allowed at discount to Indian Corporates.
- Plastics to Fuel (Pyrolysis) should generate fuel that could be standardised by way of fuels standards (BCPC) such that there becomes one spec for all P2F types. Thus a market would emerge
- The Plastics Producers should consume their plastics also as form of this fuel by blending with other fuel towards their heat and energy requirements (turbines and boilers). This should be mandated
- Such Fuel would be produced without use of agricultural land and from plastics waste. A policy should come out for production and use of such fuels and thus a market should be created

Recommendations given to NITI Aayog
MANDATORY USE OF RECYCLED PLASTICS

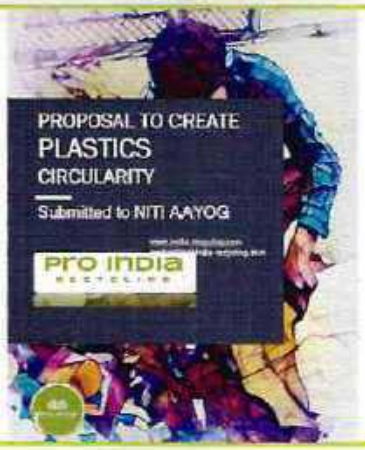
- We already know that a large part of PET used once in beverage containers, get converted to fibre and then to textiles. There is a solid secondary market for the same and the textile hubs benefit form cheaper recycled fibre. Its also a great sustainability effort of not looking for virgin PET resin.
- Research on all types of plastics towards its Commercial reuse must be encouraged for academia / corporates(CIPET/IIP/IITs/NEERI etc)
- Big Incentives (tax breaks) should be given to bring Commercial technologies for other types of plastics. Large plants should be created at 4 regional hubs by PPP route. These are available in US/ EU
- Companies should be mandated to REUSE the same type of material in their fresh production by blending quantities of the same. This would be real circular economy
- It Shall improve both the quality and scalable quantity of all types of plastics. There are huge use of recycled plastics by industry in US/EU and they have created circularity via this route
- Bottle to Bottle - Use of recycled PET in food grade plastics packaging is still not allowed by India (FSSAI/BIS). Such is allowed even in Bangladesh. India should have the same

Recommendations given to NITI Aayog
TOWARDS ORGANISED COLLECTION

- While waste picker would remain the back bone of collection & recovery (they are covered in the next section) , there has to be an infrastructure support that needs to be provided for them and others to work. Such can be provided by only Urban Development deptt and the municipalities
- Multiple Material recovery facility should be created in for every city / town/municipality . These facilities should be placed next to landfills and should be able to screen the Usable items from the household and Commercial waste.
- Land and Building should be provided by local municipalities.
- Regarding the plant and machinery - Entrepreneurs should encouraged to put either a fully automated plant for de-fraction of the waste and its sending to authorized recyclers. Or use of human capital with some training could separate and collect the fractions and then those could be simply transported to authorised recyclers
- Vocational Training could be provided under NSDC such that marginalised youth could be given jobs at these centers

Recommendations given to NITI Aayog
TOWARDS Waste Pickers - Upliftment

- The waste pickers , a migrant labour with no assets is truly marginalised as urban poor. Since s/he is not into formal job - there are no fixed pay , esi-PF, retirals, medical and health cover. This has led to 22% of such community become 'bonded' per TOI report - in the hands of 'thiledar/contractor/local gunda' who may provide a place of stay but extracts a pound of flesh. This needs to stop .
- Waste Pickers are essential requirement of India . They do get money and as much as 60% of their daily earning comes from plastics. India is a long way away from sutated waste collection and house hold segregation of waste and thus such community is required for a long time. However serious thinking and work needs to be undertaken
- Safety Awareness / Skill Enhancement / Financial Inclusion / Health and Insurance - should be undertaken
- NSDC should prepare program to build SKILLS & Entrepreneurship Models
- MSKFDC should prepare program for Inclusion of Waste pickers into Society by
  - Providing easy way of getting Safai Karamchari Card and database
  - Providing schemes of accident & life cover with Medical Insurance
  - Providing collateral free loans to the SHG



Proposed solutions towards creating circularity in Plastics....

About Pro India

Pro India, a company that believes that India's plastics litter problem can be solved in a profitable manner, and litigation with Corporate support (who are bound to bring back plastics under EPR) - we can create value in second life of plastics and share the same with waste pickers who are at the bottom of the pyramid. Following are their recommendation of generating Plastics Circularity

amit.saha@india-recycling.com PRO India Recycling www.india-recycling.com

Plastics Recycling Technology

Plastics to fuel is a great and proven technology and available now in Europe and China. It should be allowed at discount to Indian Corporates.
Plastics to Fuel (Pyrolysis) should generate fuel that could be standardised by way of fuels standards (DCPC) such that there becomes one spec for all P2F types. Thus a market would emerge
The Plastics Producers should consume their plastics also as form of this fuel by blending with other fuel towards their heat and energy requirements (turbines and boilers). This should be mandated

Use of Recycled Plastics & Plastics Products

We already know that a large part of PET used once in beverage containers, get converted to fibre and then to textiles. There is a solid secondary market for the same and the textile hubs of Ludhiana / Tirpur benefit form cheaper recycled fibric. Its also a great sustainability effort of not looking for virgin PET resin. We at PRO India has also begun 'capturing the plastics bottles in form of Tshirts' . pls find a video link https://www.youtube.com/watch?v=UJ_hoZ4EiRk&t=3s
Research on all types of plastics towards is Commercial reuse must be encouraged for academia / corporates (CIPET/IIP/IIT/NEERI etc)
Big incentives (tax breaks) should be given to bring Commercial technologies for other types of plastics. Large plants should be created at 4 regional hubs by PPP route. These are available in US/EU
Companies should be mandated to REUSE the same type of material in their fresh production by blending quantities of the same. This would be real circular economy
It Shall improve both the quality and scalable quantity of all types of plastics. There are huge use of recycled plastics by industry in US/EU and they have created circularity via this route
Bottle to Bottle - use of recycled PET in food grade plastics packaging is still not allowed by India (FSSAI/BIS). Such is allowed even in Bangladesh. India should have the same.

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Market Creation

Mandate use of recycled plastics to the same companies that are covered under Plastics Waste Rules
Retail Brands like IKEA / Nike have started using the recycled plastics and have high share of products with recycled material
GST category /discount should be created to products that have 20% or higher recycled content. This should be certified via standards (Like GRS & HIGGS is for clothing) to accommodate all types of marketable products like plastics chairs/tables etc
Other than high performance plastic products - a mandate and a flight path may be required for general use plastic products to be only created using 100% used plastics. Companies like Neelkamal , other which produces non food plastics household items - should only be allowed to make from used plastics
Polythene bags of +50 Micron thickness should only be allowed to be manufactured from recycled plastics
Plastics to Fuel has been already covered above
Such Fuel would be produced without

Exchange platform and Auctions

Plastics database is not very complete. At country level - how much plastics does get produced and then recycled is not clearly calculated and monitored. Every organisation and even the govt uses guesswork for the same. A national database may be required for not only fresh production and import of plastics (including scrap plastics that are coming as a raw material as washed flaked - semi finished goods) but also for how much each company has recycled their plastics. Different forms of plastics require different efforts to recover and then to recycle. PET bottle for eg is easy to pick, has good weight (20-50 gms) and has value (PET to fibre) whereas MLP (multi layer plastics) are composites (no real value) , very light (no value to waste pickers) and very difficult to recycle as they are mixed plastics. Yet all forms of plastics should be brought back and thus an exchange platform shouldbe created in form of 'Plastic Credits'
PLASTIC CREDIT - like carbon credit should be created as a measure of total LCA and life cycle cost of bring back plastics . Industries should be mandated to

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have certain % of Plastic credit for every virgin plastic used. This would be like Renewable Purchase Obligation (RPO) for use of commercial electricity for industries. This could become a game changer
Such Plastics Credit could then be exchanged between industries. This would create a domino effect
Such Plastics Credit Obligations (percentages) should be continuously increased for the country over time
Auctioning of such Plastic credit should be allowed so that other industries and also waste management companies/ new organisations undertake this plastics bring back and build business around the same

Regulations

In Plastics there have been several efforts in the past to reduce the plastic pollution. Such plastic waste rules started in 1990's. However , even till date not much has been effected by the polluters of the plastics themselves. The latest rule of Plastics Waste Rules =2016 also lack 'teeth' towards serious implementation
PWR -2016 does not prescribe any TARGETs of collection by industry. There should be collection targets that increase over time (like electronic waste & WEE)
There is not mention of Producer Responsibility Organisations in Plastics(its there in the case of electronic waste). There are many PROs in Europe (with Pro Europe that functions in 31 countries , deals with 15000 brands, and manages euro 1.3Tn products) which have been created as independent for profit organisations that work in bringing back the used plastic package form the CPG/FMCG industry . They bring economies of scale and scope. Such should be mandated in India
PRO concept need to be incubated and nurtured. Industry associations like FICCI / CII - who represent the very same industries should be tasked with incubation of Plastics PRO with consultation of its members. MOEF / CPCB / MOUD /Waste Management Companies should provide probono resources towards such PRO creation
The manufacturers of Plastics (Dhunseri/ Reliance etc) and the Converters of such plastics (UFLEX / Paper Products / AGI etc) should also be brought under the Plastics Waste Rules and EPR should be mandated to them as well

Reverse Vending Should be encouraged

All across Europe and in portions of Australia & US - there are Deposit scheme where the consumer gets the Deposit Back for the Plastic (and other material like glass/ aluminium cans) when such is deposited in reverse vending machines. These machines are installed in the malls / food stalls / and even in public places (tourist places, transportation hubs, places of pray, festivals etc)
Every Brand that contributes to plastics pollution via delivering products through primary / secondary plastics packaging - should be required to contribute towards ' an attractive deposit scheme' which allows the brand (in a consolidates manner) to buy back the plastics packaging for recycling and then reuse
Reverse Vending Industry should be encouraged (tight now its discouraged) and incentivised to
Aggregate the needs of Plastics Producers / Brands
Research and device new Reverse vending / Collaborate with Foreign Companies for Machines
Install and runs such machines at large scale and be viable
Gain revenues vis - Plastics Credit (covered above) and also vis advertisement revenues the machine cubicles can bring
Integrate vending needs towards 'water , cash and reverse vending' into one machine. Cash ATM and Water ATM are the thrust for govt and banking sector anyway
Brands (including Rail Neer) have obligation towards PWR and this should be the method for
complying to the extended producers responsibility (EPR) .
Aggregated vending requirements should be tendered by municipalities on standard machine and standard operating terms across India and across sectors (railways / others have separate machine requirements)
E Payments should be encouraged for such transactions as they do not involve cash and thus safe for the machines and operators. India want to go into cashless route anyway
PRO organisations - could aggregate Brands requirements and participate with RVM suppliers - linking then to the plastics economy , reverse logistics and to authorised recyclers

Waste Pickers Inclusion

Upliftment / Awareness / Skill Enhancement / Financial Inclusion / Health and Insurance

The waste pickers , a migrant labour with no assets is truly marginalised as urban poor. Since s/he is not into formal job - there are no fixed pay ,esi+PF, retirals, medical and health cover. This has led to 22% of such community become 'bonded' per TOI report - in the hands of 'thekedar/contractor/local gunda' who may provide a place of stay but extracts a pound of flesh. This needs to stop . Waste Pickers are essential requirement of India . They do get money and as much as 60% of their daily earning comes from plastics. India is a long way away from automated waste collection and house hold segregation of waste and thus such community is required for a long time. Howeverseious thinking and work needs to be undertaken

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Single Use Plastics

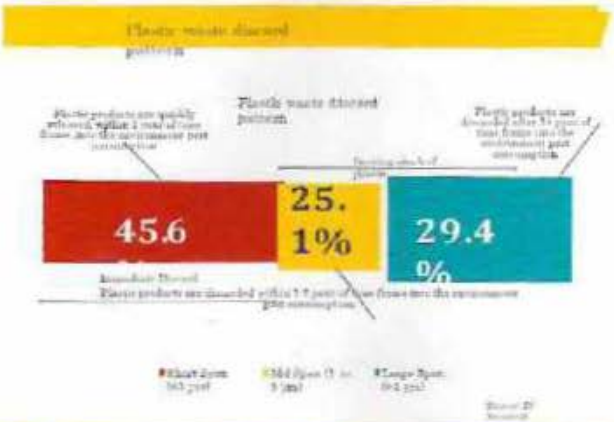
Presentation by
Materials Recycling Association of India

Presented by
Dr. Sameer Joshi

MRAI headquartered in Mumbai is the apex National Association that represents India's recycling industry for metals, paper, glass, plastics e-waste, construction waste, textile waste etc

Has more than 1200 plus direct members and over 15,000 members through its associate member organizations who are manufactures, traders, recyclers, service providers

Has worked with Niti Ayog to make the draft of the National Recycling Policy of India



Challenges & solutions to circular economy in packaging

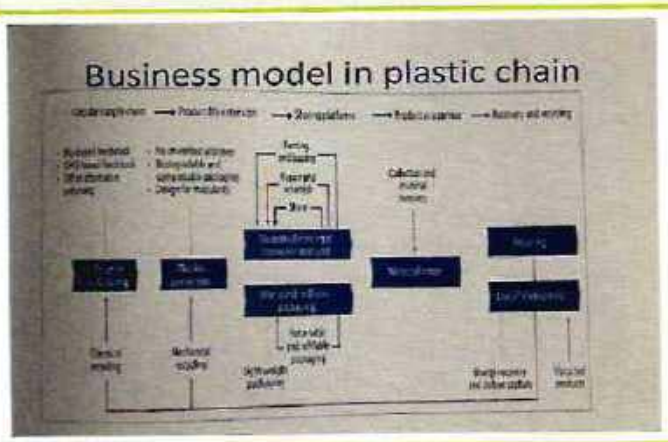
Issues to circular economy in plastics:

- **Varied no of heterogeneous materials- aluminium foils, different types of plastics etc.**
- **Difficulty in separation of multilayer packaging containing different plastics**
- **Lack of consumer awareness- prone to littering**
- **Inadequate collection & segregation mechanism of waste from municipal and solid waste**
- **Cost-effective recycling solutions to obtain virgin quality plastics from waste**

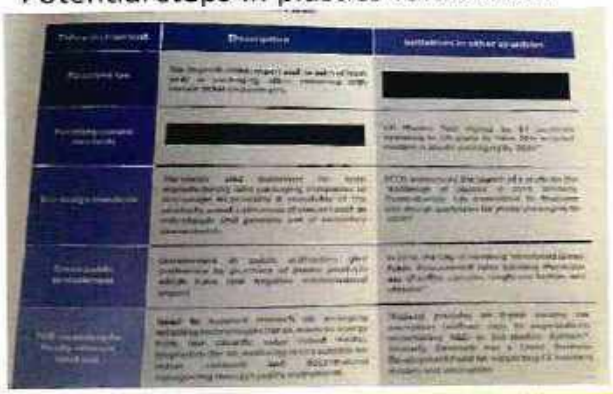
Solutions towards achieving circular economy:

- ✓ **Adoption of homogenous structures in multilayer packaging**
- ✓ **Replacement of aluminium foil with metallised plastic films**
- ✓ **Popularising buyback of plastic packaging**
- ✓ **Encourage single use plastic packaging for food etc.**
- ✓ **Loop mechanism for plastics waste- e.g for plastic pallets**

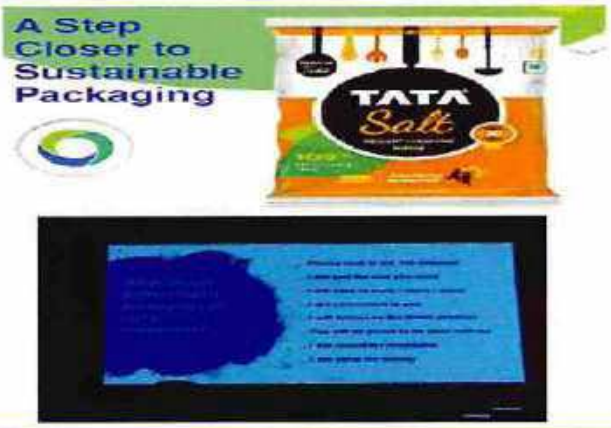
Business model in plastic chain



Potential steps in plastics value chain



Plastics and Packaging- Historical milestones



Maharashtra dairy owners : PET Vs. Pouch for packaged milk ❑ Dabur : mega plastic-waste recycling initiative in Tamil Nadu ❑ ITC : model to collect multi-layer plastic waste along with PMC and SWaCH ❑ HUL : Behaviour change curriculum called Plastic Safari in schools in Mumbai ❑ Amazon : Packaging-Free Shipment program to 9 cities in India

A long-term Sustainable solution has to be Science based evolving from a deeper understanding of product-package interactions & shelf life expectations using non-plastics options.

Research now has to address environmental impact of packaging solutions first & then define shelf life properties, since the organized retail & e commerce business models have shown that transit time or on shelf time has come down significantly in most categories of F&B & FMCG products. So why use multi-layer complex structures, which are difficult to handle at post - consumer stage.

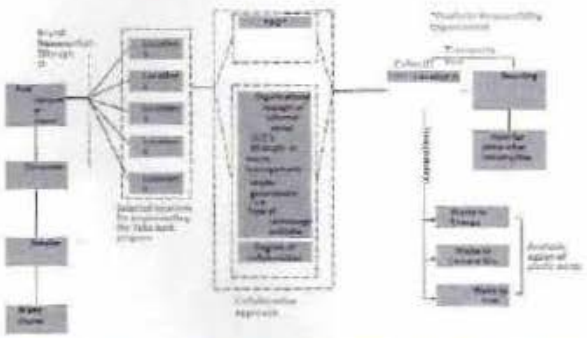
Many solutions like barrier coatings, mono-material laminates have shown promise. There is work even of environment friendly adhesives and inks. Every product; food & non-food will have its own sustainable solutions keeping product safety, preservation & protection as a prime objective for the end consumer.

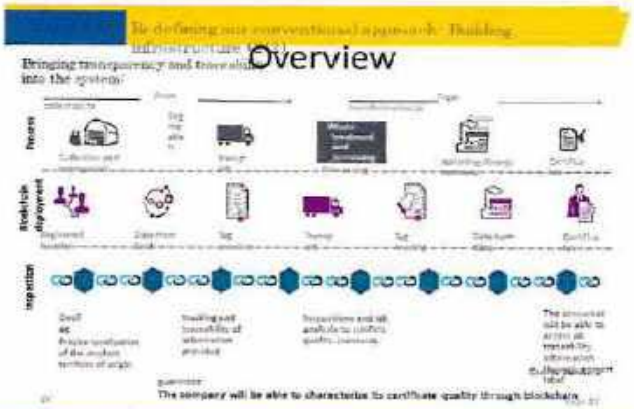
The world is moving towards creating a sustainable circular economy

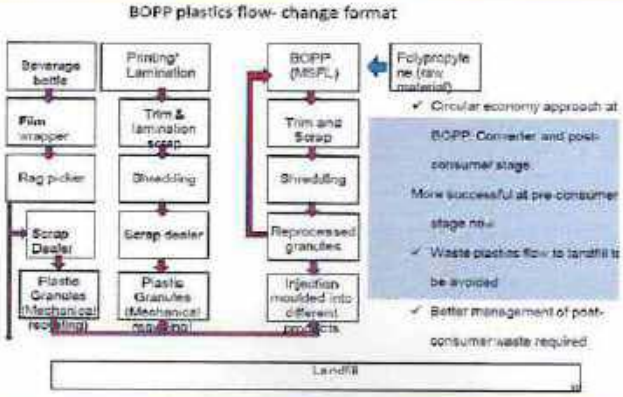
Working On 3 R's To Achieve The Goals

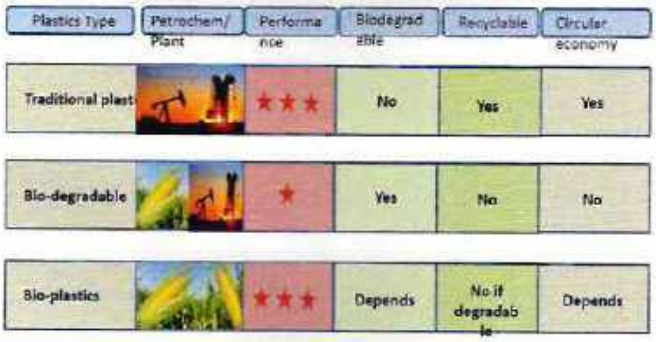
- **Reducing** the amount of plastics we use
- **Recycling** the plastics we buy
- **Reinventing** our plastic packaging.

Redefining our conventional approach- Building infrastructure (1/2)




Overview


BOPP plastics flow- change format
Beverage bottle
Printing' Lamination
BOPP (MSPL)
Polypropylene (raw material)
Film wrapper
Trim & lamination scrap
Trim and Scrap
Rag picker
Shredding
Shredding
Scrap Dealer
Scrap dealer
Reprocessed granules
Plastic Granules (Mechanical recycling)
Plastic Granules (Mechanical recycling)
Injection moulded into different products
Circular economy approach at BOPP Converter and post-consumer stage
More successful at pre-consumer stage now
Waste plastics flow to landfill to be avoided
Better management of post-consumer waste required
Landfill


Traditional plastics, Bio-plastics and Biodegradable plastics
Plastics Type
Petrochem/ Plant
Performance
Biodegradable
Recyclable
Circular economy
Traditional plast
No
Yes
Yes
Bio-degradable
Yes
No
No
Bio-plastics
Depends
No if degradable
Depends

This Chennai store wraps its vegetables in banana leaves

The way forward

- RECYCLABLE REUSABLE PACKAGING
- COMPOSTABLE PACKAGING
- PACKAGING WITH POST CONSUMER RECYCLED
- INFRASTRUCTURE FOR COLLECTION & SORTING
- RECYCLING FACILITIES IN PRACTICE & AT SCALE

Single Use Plastics can be defined as materials that serve purpose of moving goods and products from one point to another, and shall be discarded upon opening the product for consumption.

Single use plastics should be differentiated based on its applications:
a) Direct Food Contact: Direct Food contact single use plastics would be materials that have the purpose of being used for safe and hygienic storage of food stuff/ direct human consumption products. Since they serve the purpose of food preservation and hygiene purpose it would be difficult to phase them out. Hence these materials should be moved towards Mono Layer material composition which will ensure they are 100% Recyclable. Further the Brands/Manufacturer should have a strict EPR implementation for these materials.

b) Non food Contact/ Secondary: Since these products are not essential these can either be phased out over a period of 2-3 years. The emphasis should be on reuse ability of these products. If they cannot be reused multiple times, they should be phased out. During this period they should be made mandatory to be produced out of 20-40% recycled content. Post the 2-3 years period of phasing out, Non food contact single use plastics should be moved to 75% recycled material should they be absolutely necessary to

FMCG and food products in small sachets should be discontinued. A minimum size should get defined, which would take into consideration ease of collection and recoverable scrap value.

The path ahead –

Alternatives to single use plastics – technical feasibility, environmental footprints & economic viability, all stake holders participation

Work for innovative materials, package design for promoting recycling and waste management.

Role of stake holders in addressing plastic waste challenge

- **Definition of SINGLE use plastic to be seen in Indian context. Holistic approach need to be taken**
- **Alternatives to be defined, given before ban**
- **Using recycled plastics to certain applications in percentage**

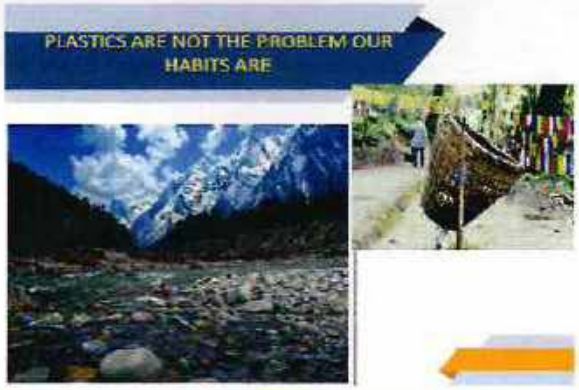
- **Focus on waste management infrastructure., collection centres by PPP or private entities**
- **Efforts for awareness: no littering & source segregation.**

Classification of rigid and flexible packaging in matrix focus on recyclability, ease of collection, litter ability, design for recycling, potential for using for no of times, EPR No/ value/ index

Such standards can be made by BIS or another organizations

97% of waste collected by number was PLASTIC

- Multi layered plastic – 62.67 %
- Single use plastics – 17.19 %
- PET bottles – 9.10 %
- Tetrapak – 3.32 %
- Other plastics – 5.09 %



Acknowledgements and references

Team MRAI and its members of Plastic Committee
IPI
AIPMA
ICPE
DR Vijay Habbu
FICCI and Accenture
EY
Lucro
Packaging 360
Max Films

Annexure

Sr. No.	Single Use Plastics: Application	Current Material Used for Application	Alternative Recommended	Remarks
1	Trash Bags/Bin Liners	LDPE,LLDPE,Recycled PE/LDPE/LLDPE/HDPE/ HMHDPE	Certified Compostable Biopolymers	Application used mainly for wet waste/organic waste/kitchen disposal. Generally goes to landfill resulting in a mixture of mixing of degradable waste in non-degradable material. Leads to buildup of gases such as methane.Trash Bags contaminated with food and other organic waste cannot be recycled unless cleaned hence involves additional processes to clean. Whereas, trash bags made with Certified Compostable Biopolymers can be disposed together along with organic waste in composting facilities since both the content and the container are Certified Compostable resulting in End-of-life cycle for both the waste and the bags containing it. Results in generation of compost which can be used as soil conditioners.
2	Plastic Carry Bags/Grocery bags	LDPE,LLDPE,Recycled PE/LDPE/LLDPE/HDPE / HMHDPE	Certified Compostable Biopolymers, Paper Carry Bags, Cloth Bags	Application principally used for Single Use and discarded. Ample goes in landfill.
3	Plastic shopping bags (Typically D punched handle bags used in Garment shops)			
4	Plastic Cups (Tea cups)	Thermoformed PS/ PP/ PET	Cups made from Certified Compostable Biopolymers, Paper glasses laminated with Certified Compostable Biopolymers, Reusable cups made from glass, Bamboo Cups (Kulhad)	maximum Utility time is 1-5 minutes after which discarded. Very low weight for for effective collection. Prone to littering. Cannot be recycled without cleaning. Contaminated with food. Mainly goes into Landfills.
5	Plastic tall cups (glasses)	Thermoformed PS/ PP/ PET	Tall Cups made from Certified Compostable Biopolymers, Paper glasses laminated with Certified Compostable biopolymers, Reusable cups made from glass material.	maximum Utility time is 1-5 minutes after which discarded. Very Low weight for for effective collection. Prone to littering. Cannot be recycled without cleaning. Contaminated with food. Mainly goes into landfills.
6	Plastic Straws	Polypropylene	Certified Compostable Straws, Paper Straws	maximum Utility time is 1-5 minutes after which discarded. Very Low weight for for effective collection. Prone to littering. Cannot be recycled without cleaning. Contaminated with food. Mainly goes into Landfills.
7	Plastic cutlery	Polypropylene, Polystyrene, Oxo-Degradable polymers	Wooden cutlery, Certified Compostable cutlery.	Single use and requires to be food contact approved. Difficult during segregation. Cannot go into PE recycling stream. Most of the waste is food contaminated, hence not accepted by recyclers. Segregation difficult due to identification of material of the products especially in Black. Doubt on the Food Grade properties of the materials.
8	Plastic take away containers	Polypropylene	Certified Compostable containers, Bagasse based products	Single use and requires to be food contact approved. Difficult during segregation. Cannot go into PE recycling stream. Most of the waste is food contaminated, hence not accepted by recyclers.
9	Plastic thermoformed products like Trays, Bowls, Plates, containers, Ice etc (Made up of PS/ PP/ PET)			
10	Hot & Cold Beverage cup Lids (Made up of PS/ PP/ PET)			
11	Secondary Packaging liners	LDPE/ LLDPE/ HDPE/ HMHDPE	Certified Compostable films as liners	Can be collected and composted to close the loop.
12	Fruit & Vegetable (F&V) Bags	PE/PP etc	Certified HOME Compostable F&V bags (Food & Vegetables)	F&V / Grano bags are consumed a lot for packaging grocery / fruits - vegetables. Normally they are consumed once & later used as a garbage bag. Some bags if done in Certified Compostable can be used to collect organic waste & further composted. Globally many countries have regulations to use only Certified Compostable bags for carrying Fruit & vegetables / Kirana.
13	Milk Pouches	LDPE/LDPE	Certified Compostable Biopolymers	Milk pouches used extensively is a one time usage application and end up in landfills as cannot be reused. Yes there is a challenge to ensure food grade standards and that the packaging properties required for this application is maintained. But definitely an alternative that the even the milk industry is looking for.

14	Oxo-Degradable Carrybags, trash Bags, grocery bags	Oxo-Degradable Polymers	Certified Compostable Biopolymers, Cloth Bags	Products made from Oxo Degradable is marketed as Bio-Degradable products which in fact degrade into micro-particles and enter food chain and water by various channels which is much more harmful than large plastic pieces.Such products shall be made with Certified Compostable Biopolymers as they degrade into non-toxic material.
15	Non-Woven Bags	Polypropylene	Certified Compostable Biopolymers, Cloth Bags, paper bags	Made of polypropylene. Does not Degrade hence go into landfills. Have to be separately segregated for PP Recycling.
16	Sapling Bags/Nursery Bags	Polyethylene, recycled Polyethylene	Certified Compostable Biopolymers	Nursery Bags/Sapling Bags are discarded after sapling plantation in the surrounding areas and largely are not recovered. Often the saplings are planted along with the nursery bag which depletes the soil quality and also harmful for the plants. Certified Compostable Bags degrade to create compost which is also a soil conditioner. Such bags can be discarded and collected for compost to reuse for the same nursery/ forest regular.
17	Mulch films	LDPE,LLDPE,Recycled LDPE/LLDPE	Certified Compostable Biopolymers	Though this is not a Single Use Application, much of the Mulch Films manufactured is from recycled PE loses all the other single use application. Issue with this application is that they are burnt after their use or after it gets shredded during its life cycle. Secondly if not burnt, the shredded parts mix with the soil resulting in deterioration of soil quality over time. China lost substantial agriculture land due to "white pollution"which was a resultant of use of plastic mulch films.Certified Compostable materials on the other hand provide compost upon degradation conditioning the soil. Challenge in India is that the cost of Mulch Films is low and the agri sector is very sensitive to any high cost inputs in materials or accessories.
18	Ear buds	plastic pipe with cotton heads	alternatives available	cotton cannot be segregated from stick used for it and like many countries this should be banned.
19	Garment bags	BOPP	Certified Compostable Biopolymers- transparent or translucent	Garment industry needs packaging even for their storage in shops as dust and pollution spoils new garments, however the number is huge and can be converted to compostable biopolymers

20	Hand gloves for medical application	PE/Rubber	Certified Compostable Biopolymers- transparent or translucent	medical gloves cannot be reused/recycled etc. It goes in to medical waste and then either burnt or filled in land as gloves disposable is to move to certified
21	Hand gloves general purpose	PE/Rubber	Certified Compostable Biopolymers- transparent or translucent	
22	Single use tooth brushes	PE/PP and bristles are made from polyamide	Certified Compostable Biopolymers or bamboo	Single use tooth brushes, mainly used by hospitality industry need to move to more environmental friendly solution in the form of compostable polymers and/or sustaining like bamboo
23	One time shampoo sachet	Multilayer packing	Certified Compostable Biopolymers	However, the small sachets should be banned as collection is almost impossible.
24	Water bottles less than 500 ml	PET	NA	collection and seperation is not difficult, what can be encouraged is efforts to improve recycling and use in industrial applications
25	packing bags in railways for blankets	PE	Certified Compostable Biopolymers, paper bags	
26	Ladies Hygiene Products			It can't be banned though it's a single use item

Single Use Plastics

IPF
Indian Plastics Federation

Presented by
Shri Ashish Agarwal

Presentation by
Indian Plastics Federation (IPF)

How India's numbers are looking

1.35 B	71.5%	18%	10%
POPULATION	AVERAGE LITERACY RATE	BPL	UNEMPLOYMENT

POINTERS

- India is in a unique position, being the largest democracy in the world
- All it's legislation and policies have to be tailor-made and unique in spirit and nature
- What is single use plastic for developed nations, is multi-use plastic for Indian democracy
- Indian culture has always been a re-use culture of necessity, not privilege

Toothbrush

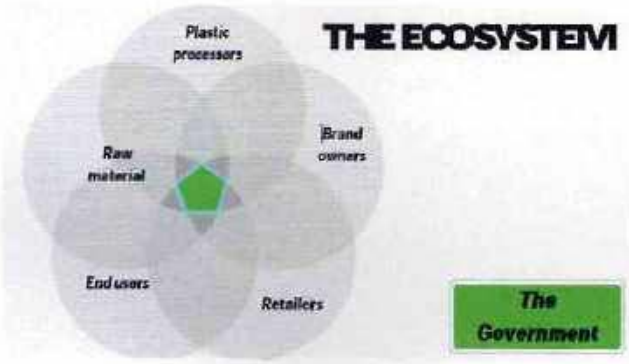
FOREIGN
Used as:
Toothbrush

what is single use plastic for developed nations, is multi-use plastic for indian democracy

INDIA
Used as:
Toothbrush
↓
Cleaning tool
↓
Used as support to put draw-strings around pants


PlasticBottle
FOREIGN
Used as
DrinkingBottle
what is single use plastic for developed nations, is multi-use plastic for indian democracy
INDIA
Used as
DrinkingBottles
Storefoodinside
Growingplants

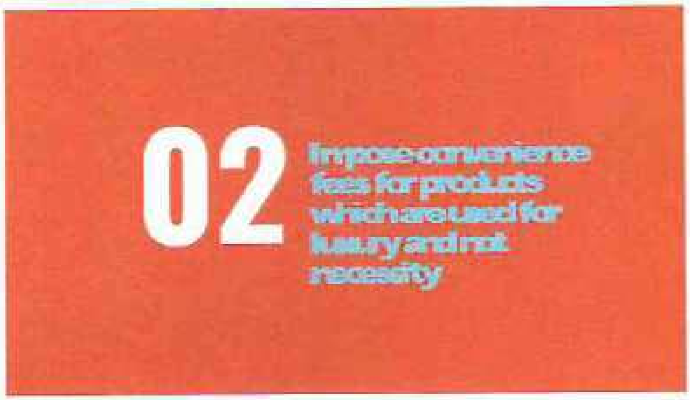

Newspaper
FOREIGN
Used as
Newspaper
what is single use plastic for developed nations, is multi-use plastic for indian democracy
INDIA
Used as
Newspaper
Sell it off to a recycler


THE ECOSYSTEM
Plastic processors
Brand owners
Raw material
End users
Retailers
The Government


00
OUR SUGGESTIONS


01
Most of the single use plastic are of low thickness or inferior quality which does not foster re-use.
Hence, increase the thickness and standardize the legislation of quality


Existing law 50 microns
Our suggestion
Any size or thickness which is attractive to the rag pickers and/or attractive for the end user to re-use it


02
Impose convenience fees for products which are used for luxury and not necessity


Our suggestion
For starters, impose punitive duties/taxes on convenience single-use plastics like straws, cutlery etc
TAX

03

Packaging

Legislation to enforce buyback of packaging material by the brand owners.

Brands can be incentivised to set up recycling/collection centers.

Let's promote EBR as well as EPR

Our suggestion

In old times, Parle used to collect the aluminium crowns of Thumbs up for an incentivised gift to the customers and discount to retailers and recycle it.

Similarly, all the brand owners should also under EBR compulsorily start this activity

04

Compulsory company laws for brand owners:

They should give the ratio of packaging used and recovered back in their balance sheet.

They should be incentivised above a certain ratio

Our suggestion

A certain % of CSR should be made compulsory for recycling

05 Suggestions for Government actions

What our Central Govt. can do:

- There are approximately 230 municipal corporation. Hence, we should initiate competitive ranking of municipal corporations with respect to solid waste management. It should be highlighted in the national media.
- To keep repository of good practices in progress of municipal corporations and start mentoring schemes.
- Top 10 municipal corporation will train the bottom 10 corporation and suitable incentives should be offered to the toppers.

What our Central Govt. can do:

- Make plastic waste recycling industry as a priority industry for all state governments.
- Special team to be instituted to advice govt on discontinuation of non recyclable plastic. It should comprise of educational institutions, research centers, government representatives, major producers, major plastic associations, brand owners and individual scientist of repute.

What our State Govt. can do:

- Waste segregation to be made mandatory by law. For example, societies/ section 25 companies, with more than 50 flats should pay a waste collection cess and it can charged from their members.
- Each state government over a certain population limit should earmark land for recycling industry.

What our State Govt. can do:

- Identify major areas of single use waste generation events and mandate recycling resources during or near these events. Ex. festivals, weddings, entertainment shows, malls.
- Any public place with large footfall should reserve space for single use waste collection like airports, railway stations, bus stations, and malls.

Single Use Plastics

Presented by
Smt Chitra Mukherjee

Presentation by
Chintan Environmental
Research and Action Group

VIEWS / OPINIONS FORM CHINTAN ENVIRONMENTAL RESEARCH & ACTION GROUP

S.No	Types of SUP	Category of Ban
1	Straws, stirrers, plastic bags, woven plastic bags	Easy to ban and implement Can be banned in Phase 1.
2.	Coffee cup lids, plastic plates, plastic and thermocol glasses, spoons, folks, knives, plastic lined glasses, PET water bottles of less than 200 ml.	Medium. Ban in Phase 2. Adequate alternatives need to be ready. Also, crockery banks should be useful.
3.	Wet wipes, flexi-banners (widely used for advertising), sachets for sugar, ketchup, salt and pepper in restaurants and take aways.	Medium. Ban in Phase 3 because it needs more effort on part of the public. Containers can be substituted by dispensers in-house and no condiments for take-aways. Harsh, yes, but a small price for protecting the country. Flexi-banners now being substituted by colour printing on canvas. Comparable prices where moderate demand.
4.	Sachets of small size (50 ml or less).	Hard. Ban in Phase 4. The argument that smaller sachets make shampoo etc affordable for the poor is a dated argument. The same can be packed in small glass bottles.

Single Use Plastics

Toxics Link

Presentation by
Toxics Link

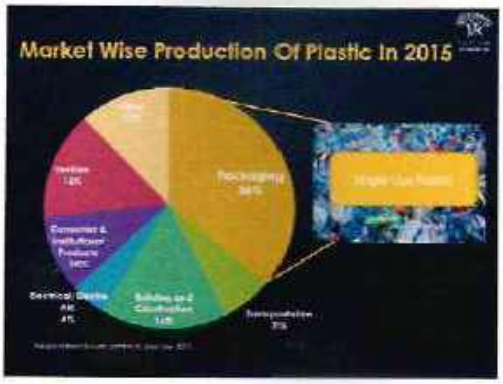
Presented by
Shri Satish Sinha

ABOUT TOXICS LINK

- NOT FOR PROFIT, NON GOVERNMENTAL ORGANIZATION
- 20 YEARS OF ENGAGEMENT: CHEMICALS, WASTE AND TOXICITY AND ENVIRONMENTAL HEALTH ISSUES
- HAZARDOUS, BIO MEDICAL AND MUNICIPAL WASTE, E-WASTE, ASBESTOS, WASTE TRADE, FOOD SAFETY AND CHEMICALS MANAGEMENT
- WORK ON REDUCING HEAVY METALS TOXICITY(LEAD AND MERCURY) FROM OUR LIVES

PLASTIC

- GLOBAL PRODUCTION OF RESINS AND FIBERS INCREASED FROM 2 MILLION TONNES IN 1950 TO 381 MILLION TONNES IN 2015
- OUT OF THE NINE PERCENT OF THE NINE BILLION TONNE EVER PRODUCED HAS BEEN RECYCLED AND 12 PERCENT INCINERATED



What Is Single Use Plastic?

- Single Use Plastic represents the spirits of manufacturing giants, "take, make, use and dispose".
- They are often referred to as disposable plastic
- They are manufactured with the aim of using only once before disposing or recycling
- The definition raises concerns as it stresses upon anything that is not being "reused" or "refilled"
- On the move Plastics

46
16
580
2.5
36.4

Sectors That Use Single Use Plastics

- Restaurants and Eateries
- Retail stores
- Informal vendors
- Hospitality industry
- Healthcare
- Pharmaceutical
- Food and beverages packaging
- Online shopping
- Tableware industry
- Nicotine industry
- Alcohol industry

Countries Which Have Banned Plastic

- Most bans across the world are limited to plastic bags or straws.
- The ban is not a blanket order as it mostly defines a thickness below which plastic bags are banned

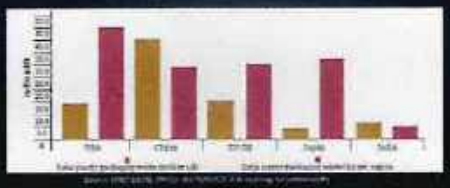
Canada	India	Ireland	Mexico	Morocco
Some States of US	Kenya	Rwanda	United Kingdom	France
Chile	China	Costa Rica	European Union	Australia

Single Use Plastic Which Have Been Included In The List Of Items To Be Banned By European Commission

Indian States Which Have Banned Single Use Plastic

Karnataka	plastic carry bags, banners, buntings, flex, plastic flags, plastic plates, plastic cups and plastic sheets
Maharashtra	Plastic used for packaging medicines and drugs, Food grade virgin plastic used for packaging milk, Compostable packaging bags used for horticulture and agriculture purposes, Plastic bags used for exporting goods, Plastic used at the manufacturing stage, Plastic used for handling of solid waste.
Uttar Pradesh	Ban of all plastics and styrofoam including cup and plates
Uttrakhand	The ban is on the usage of single-use plastic bags, plastic cutlery, and thermocol
Tamil Nadu	Ban on Plastic sheets/film used for food wrapping, Plastic sheets used as dining table covers, Thermocol plates, Plastic-coated paper plates, Plastic-coated paper cups, Plastic teacups, Plastic Tumblers, Thermocol cups, Water pouches/packets, Plastic Straws, Carry bags of all thickness, Plastic coated carry bags, Plastic flags, Non-woven polypropylene bags

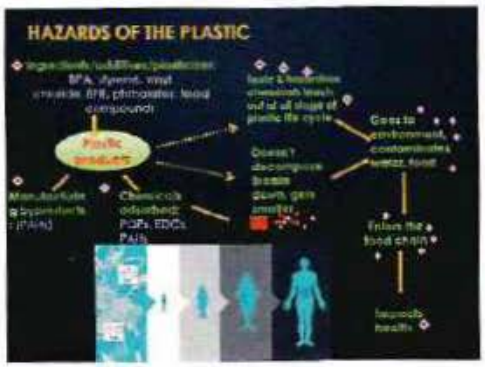
Plastic Production – Indian Scenario



- In 2017-2022, the predicted polymer consumption growth is 12.9%.
- Indian packaging industry has registered a CAGR of 15% from 2012-2017.
- 4.3 kg per capita consumption in packaging in India

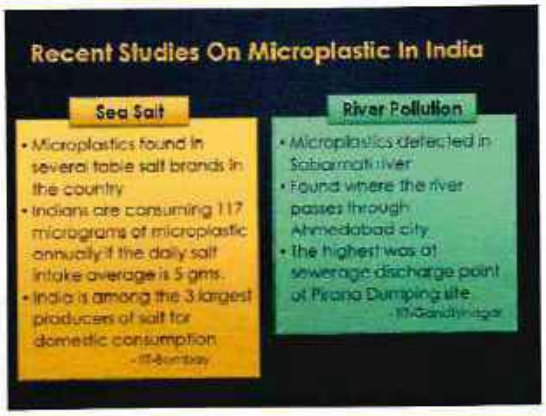
Direct Exposures To Plastic

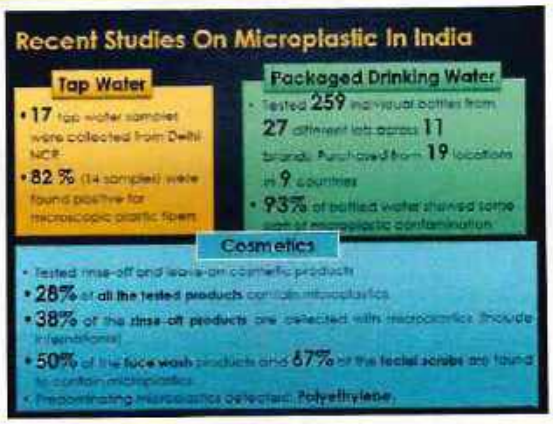
TOXINS	USES	HEALTH IMPACT
Acrylonitrile	Drinking cups, acrylic carpet	Carcinogen
Bisphenol A	Polycarbonate plastics, plastic tableware, dental fillings	EDC
Cadmium	Colorant and Stabilizer	Carcinogen, Neurotoxin
Flame retardants	Home furnishing and Electronics	EDC, Immune Disruptor, Hormone Disruptor
Lead	Stabilizers	Growth Inhibitor, Reduced Kidney Functionality
Perfluorinated Substances (PFAS)	Grease and Stain Repellant	Carcinogenic, Thyroid Disruptor
Phthalates	Plasticizer	EDC, Neurotoxin
Styrene (Vinyl Benzene)	Polystyrene plastics and expanded polystyrene.	Carcinogenic
Vinyl Chloride	PVC; plastic furniture	Liver Cancer
SCCP	Plastic consumer product, children's products	Carcinogen, Disrupts Liver and Kidney Functionality



MICROPLASTICS

- Synthetic Or Semi-synthetic, Solid, Water Insoluble, High Polymer Plastic Particles Of A Size Range Below 5mm.
- Used Both As A Raw Material For A Number Of Products And Produced From Degradation Of Any Plastic Product
- Small Size Allows Them To Pass Through Wastewater Treatment Plants And Reach The Oceans Through Surface Water Bodies And Rivers
- Microplastics Are Non-biodegradable And Persistent In Marine And Freshwater


Recent Studies On Microplastic In India
Sea Salt
• Microplastics found in several table salt brands in the country
• Indians are consuming 117 micrograms of microplastic annually if the daily salt intake average is 5 gms.
• India is among the 3 largest producers of salt for domestic consumption
- IIT-Bombay
River Pollution
• Microplastics detected in Sabarmati river
• Found where the river passes through Ahmedabad city
• the highest was at sewerage discharge point at Pirana Dumping site
- IIT-Gandhinagar


Recent Studies On Microplastic In India
Tap Water
• 17 tap water samples were collected from Delhi NCR
• 82 % (14 samples) were found positive for microscopic plastic fibers
Packaged Drinking Water
• Tested 259 individual bottles from 27 different lots across 11 brands. Purchased from 19 locations in 9 countries
• 93% of bottled water showed some sign of microplastic contamination
Cosmetics
• Tested rinse-off and leave-on cosmetic products
• 28% of all the tested products contain microplastics
• 38% of the rinse-off products are detected with microplastics (Include polyethylene)
• 50% of the face wash products and 67% of the facial scrubs are found to contain microplastics
• Predominating microplastics detected: Polyethylene

Single Use Plastic Ban

Single Use Plastic often referred to as disposable plastic, is manufactured with the aim of using only once before disposing or recycling[1]. These include plastic used for packaging, bottled water, plastic bags, straws, blood bags and numerous others. Single use plastics have largely replaced traditionally used material for packaging such as metal and jute. The world produces more than 400 million tons of plastics every year out of which 36% is packaging, single use material designed for immediate disposal. Indian Consumption of packaging waste stands at 4.3 kg per capita which was growing at a CAGR of 15% from 2012 to 2017[2].

Table 1 Adapted from Plastic & Health: The Hidden Costs of a Plastic. 2019

TOXIC CHEMICALS ADDITIVES TO PLASTIC		
TOXINS	USES	HEALTH IMPACT
Acrylonitrile	Drinking cups, acrylic carpet	Carcinogen
Bisphenol A	Polycarbonate plastics, plastic tableware, dental fillings	EDC
Cadmium	Colorant and Stabilizer	Carcinogen, Neurotoxin
Flame retardants	Home furnishing and Electronics	EDC, Immune Disruptor, Hormone Disruptor
Lead	Stabilizers	Growth Inhibitor, Reduced Kidney Functionality
Perfluorinated Substances (PFAS)	Grease and Stain Repellant	Carcinogen, Thyroid Disruptor
Phthalates	Plasticizer	EDC, Neurotoxin
Styrene (Vinyl Benzene)	Polystyrene plastics and expanded polystyrene.	Carcinogen
Vinyl Chloride	PVC; plastic furniture	Liver Cancer
SCCP	Plastic consumer product, children's products	Carcinogen, Disrupts Liver and Kidney Functionality

With so many toxic additives we should ban single use plastics with readily available alternatives which do not have an economic or environmental impact.

[1] UNEP (2018). SINGLE-USE PLASTICS:A Roadmap for Sustainability.
[2] Plastindia. 2018. Report on Indian Plastic Industry. Edition 2.

1. **Polythene Bags**

   Plastic Bags are being used rampantly and contain many toxic chemicals. The ban on polythene bags of lesser thickness has been ineffective[2]. Therefore, we suggest a complete ban on polythene bags. With many alternatives available such as jute bags, canvas bags, denim bags and many others which are reusable this ban is plausible and it will be effective with careful implementation.

2. **Plastic Disposable Cups/ Plates/Glass**

   Plastic disposable cups and plates need to banned in order to control the littering and subsequent mismanagement of waste. Plastic Disposable Cups/ Plates/ Glass are used for food consumption. The toxic additives can leach into the food and therefore can have adverse health impacts.

3. **Plastic Cutlery**

   Plastic cutlery which often comes with packaged food or takeaways is many a times thrown away even before using. Plastic Cutlery can potentially cause health hazards due to toxic additives and damage the environment. There are alternatives available to the ecofriendly plastic cutlery so it can be banned.

4. **Plastic Straws**

   Their consumption is increasing with passing time however they are not segregated, collected or recycled. Banning of straws does not cause any inconvenience and even alternatives such as steel and paper straws are readily available.

5. **Plastic Alcohol Bottles**

   Most alcohol bottles are being packaged in glass bottles, however in a quest to increase profits testers and small alcohol bottles are being packed in plastic bottles. This generates unnecessary plastic waste. Use of plastic bottles for alcohol packaging should be banned.

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[2]Mahesh P.B. 2014. Plastics and the Environment. Toxics Link. Retrieved from - http://toxicslink.org/docs/Full-Report-Plastic-and-the-Environment.pdf

6. **Thermocol Products**

Thermocol is around 98% air so it is not cost-effective to store or ship. When you combine that with the fact that it takes a lot of space, there is a very negative scrap value. Given its porous nature, thermocol adsorbs many other pollutants in the sea water. Therefore there is a need to include them in list of single use plastics that need to be banned.

7. **Plastic Wrap**

Thin sheets of plastic used for wrapping food, books and finds many other applications should be banned as these mostly thin sheets are difficult to recycle and segregate and end up in landfill as it is.

8. **Pharmaceutical Liquid plastic bottles**

Liquid medicines used to be packed in glass bottles. However nowdays these glass bottles are reing replaced by plastic bottles . Therefore it should be made mandatory for pharmaceutical industry to use only glass bottles.

9. **Small Plastic Packaging**

Small packaging of FMCG products such as small sachet of shampoo, ketchup, pickle should be banned as they cater to a very small population. These plastics are generally difficult to separate and have not recycled value. Water pouches should also be included. This should even include water pouches being sold.

10. **Plastic used in Cotton buds**

Cotton buds used as ear buds often come with plastic sticks. Small in size they are difficult to segregate and recycle therefore end up as litter and in landfills. They can be easily replaced by reusable wooden sticks from which the cotton can be removed.

11. **Plastic filters in cigarette butt**

The plastic filters used in cigarette butts should be banned as it is difficult to segregate and recycle and finally end up in litter.

12. **Balloon sticks**

Sticks used in balloons again ends up in litter and are not recycled. Therefore it should be banned. Alternatives include using a thread can be replaced with plastic sticks.

13. **Plastic Gloves**

Plastic Gloves are being used rampantly in hospitality industry which are low grade and can be easily replaced with stainless steel tongs or cloth gloves which can be washed and re – used.

14. **Plastic Tags**

Plastic tags being used in food items and decoration, such as ones denoting "Happy Birthday" should be banned as well.

Single Use Plastics

Presented by
Dr. Suneel Pandey

Presentation by
The Energy & Resource Institute
(TERI)

Single Use Plastics (SUPs)

- Single use plastics (SUPs) are generally defined as disposable plastics, commonly used for packaging and intended to be used only once before they are thrown away or recycled
- The production expected to grow in emerging economics due to economic development and urbanisation
- Collection is major challenge as due to low cost they are not attractive to waste pickers

Packaging Waste

- Generally, all the packaging material used end up as packaging waste.
- Some times they are reused, mostly recycled.
- Packaging waste too dirty to recycle end up at landfills and some times in drains clogging it
  - Cause of fires at then landfills and hence pollution
- Open burning of packaging waste is also a matter of concern
- Recycling of packaging waste in informal sector is of concern due to obsolete technology and pollution issues
- Multi-layered packaging is also matter of concern as it is neither economical to collect it nor recycle it

Mixed waste composting

Sorted/separated plastics => RDF => co-processing

Advantages of co-processing

- High flame temperature (2000°C) – ensures complete destruction of harmful pollutants
- High residence time >5 sec in oxygen rich atmosphere - ensures complete destruction of organic compounds including dioxins and Furan
- Total neutralization of acid gases, sulphur oxides and hydrogen chloride- by the active lime in the kiln load.
- The biggest advantage is that co-processing leaves no residue to be land-filled.

Use of plastic in road making

The implementation of plastics in roads also opens a new option for recycling post consumer plastics

Advantages of Plastic Road....

Reduced need of Bitumen by around 10 percent.

- For 3.75 m wide road 1 tonne of Plastic is used per KM. Saves 1 tonne of Bitumen.
- Strength & Performance of road increased by 100 percent.
- No effect of radiation like UV.
- Better resistance to water & water stagnation.
- No stripping & no potholes
- No leaching of plastics.

Other options/measures

- Pyrolysis is also attractive but
  - Sensitive to diesel price
  - Economy of scale needs to be defined
  - Environmental issues need to be addressed
  - Benchmark for pyrolysis oil needs to be established
- Pyrolysis oil to plastic feed stock needs to be researched which in turn would address circularity

Other issues

- Government of India's commitment to ban SUPs by 2022
  - Commercialisation of bio-based alternative products
- Incentive for collection of SUPs
- Approach to circular economy principles
  - E.g. feed stock from pyrolysis oil
- Convergence with low carbon development strategy
  - Decarbonisation of sector, role of bio based alternatives, etc.

Single Use Plastics

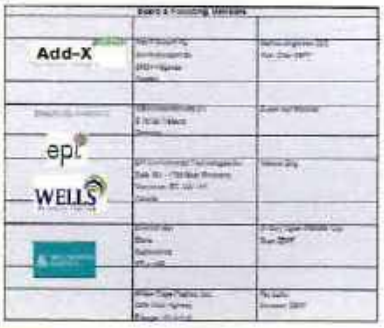
Presented by
Shri. Akash Sharma

Presentation by
Oxo - Biodegradable
Plastics Federation (OBPF)

Contents

- Oxo-Biodegradable Plastics Federation
- Overview of oxo-biodegredation
- Oxo-biodegradation Standards
- Tier 1 – Oxo-degradation of Polymers
- Tier 2 – Biodegradation testing
- Tier 3 – Ecotoxicity testing
- Food contact regulatory status
- Misleading statements
- LCA Studies
- Oxidation, the most natural way....
- Applications

OXO-BIODEGRADABLE PLASTICS FEDERATION



The **OXO-BIODEGRADABLE PLASTICS FEDERATION (OBPF)**

is an industry wide, global collaboration group formed to promote the appropriate use of oxo-biodegradable products through participation in the development of standards, regulations, material guides and positive community interaction.

The OBPF has been founded by a group of leading manufacturers and technologists and is supported by scientific, economic and social research into the development of products, applications, and systems deriving from and using oxo-biodegradable products. It is intended to help educate and further public awareness of oxo-biodegradable products as an available alternative to existing products and to promote the use of these products without any anti-competitive activities in relation to other relevant industry and academic associations.

All members of the OBPF must abide by the strict code of conduct as detailed in our Articles of Association.

Overview of Oxo-Biodegradation

Oxidative degradation due to heat/light in the open environment:

Mw reduction; structural/chemical changes; loss of mechanical integrity, which under the action of wind/rain, causes structural disintegration of the material.

This material can then become intrinsically mixed into the environment where it becomes available for biodegradation (Mw 4,000-10,000 Daltons)

Oxidised, low Mw carbonaceous material can be used as a food source by microbes (cf. vegetation) converting the carbon to organic waste (humus), biomass (growth) and CO_2.

The CO_2 can be collected and measured as a means to determine the degree of biodegradation of the oxidised polymer.

Oxo-biodegradation Standards

Oxo-biodegradable polymers can be tested and characterized according to:

"**ASTM D6954-18** for Plastics that Degrade in the Environment by a Combination of Oxidation and Biodegradation"

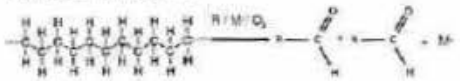
Utilises a **3-Tier** methodology:

Tier 1 – Oxo-degradability
Tier 2 – Biodegradability
Tier 3 - Ecotoxicity

BS8472, UAE S 5009, SASO 2879 are similar to ASTM 6954-18

Tier 1: Oxo-degradation of Polymers

Polyethylene - Mw ≥ 250,000



Chain scission/oxidative degradation can occur by free radical catalytic oxidation by certain metal ions forming a carbonyl group at each break point.

The carbonyl level can be measured (by FT-IR) to chart the reaction kinetics, E_s, Mw.

Metal ion catalyst is regenerated allowing reaction to continue and average chain length to progressively reduce.

Tier 1: Oxo-degradation of Polymers

The reaction to heat and UV light is tested by exposing samples of material containing the appropriate grade of Oxo-biodegradable additive master batch at the recommended addition level.

The accelerated ageing conditions used consist of exposure to a blend of UV light to simulate sunlight, using an exposure cycle in accordance with a standard test method such as ASTM 5208-01. The temperature of the cabinet is maintained at typically 50-70°C.

Periodic analysis by FT-IR and HT-GPC is performed to characterise the degradation profile.

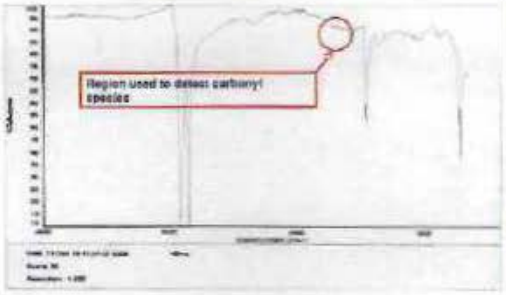
Tier 1: Oxo-degradation of Polymers

The oxidation step causes the formation of carbonyl groups.

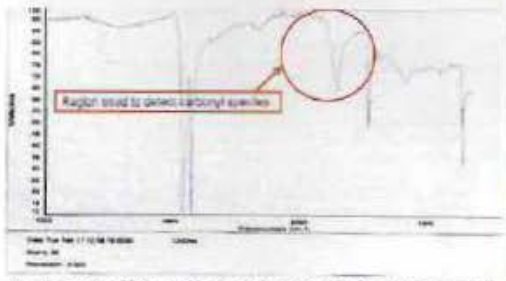
These groups can be measured by FTIR spectroscopy.

The growth in carbonyl groups is directly related to the reduction in molecular weight as each carbonyl group represents a complete chain scission.

Tier 1: Oxo-degradation of Polymers



Tier 1: Oxo-degradation of Polymers



Growth in carbonyl index tracking level of oxidation of polymer and reduction in molecular weight

Tier 1: Oxo-degradation of Polymers

The PP sheet was tested following ageing at 60°C in a UV test cabinet.
It can be seen that after approximately 46 days of ageing 60°C the molecular weight had dropped to the required 25,000.

Tier 2 – Biodegradation testing

Oxidised material is analysed for aerobic biodegradation under standard methods simulating various natural environments

The oxidatively degraded material is mixed with the appropriate material for the environment under consideration, incubated at the relevant temperature while directly measuring the level of CO_2 produced.

CO_2 produced is corrected by subtracting that produced from a blank system (containing the same level of standard innoculum) and normalised against the theoretical level of CO_2 that could be produced from the amount of material used in the test.

Tier 3 – Ecotoxicity testing

The residues and by-products of the oxo-biodegradation of the test materials are tested in accordance with international standards such as OECD 207 & 208 (earthworms and plants) for ecotoxicity.

Oxo-biodegradable products compliant with ASTM D6954-18 will demonstrate no ecotoxic effect within the requirements of these standards, and comply with the heavy metal and toxic substances content requirements of standards such as EN13432.

Food contact regulatory status

Oxo-biodegradable additive masterbatches should be formulated to be suitable for food contact applications.

Major food contact specification bodies include the European Community (through Commission Regulation (EU) 10/2011 and its amendments and in America, the FDA (through their positive listings and "Chapter" suitability).

Suitable migration modelling and/or testing can be performed to demonstrate compliance.

Misleading Statements

It does not biodegrade.

It is not stable.

It is harmful or unsafe.

It just fragments into smaller pieces of plastic.

No way of proving it works.

It contains heavy metals.

All Untrue

LCA Studies

Intertek Expert Services, UK, 2012
A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags

UK Environment Agency Report SC030148, 2011
Life Cycle Assessment of Supermarket Carrier Bags

IFEU, Germany, 2009
LCA of waste bags

Oxidation, the most natural way....

Prof. Andrej Kržan
Quote: "...Microorganisms recognize biodegradable polymers as food..."
...Decomposition generally begins with fragmentation...
the products of this decomposition are mineralized by microorganisms..."

A review of biodegradation of plastic waste : G. Dhanavel1, VR Mohana jeya Valli2 and M. Thirumarimurugan
Quote: "....with living organisms. This takes place in two steps. The first step is the fragmentation of the polymers into lower molecular mass species by means of abiotic reactions

BASF: "....becomes smaller and smaller until it can be digested by the bacteria..."

Applications

Examples of suitable applications...

- Carrier Bags / Courier and Security bags / Mail Order Bags / Magazine and Newspaper Bags
- Soil remediation, agricultural / horticultural applications e.g. banana bags, mulch film
- Bubble Wrap and Cushioning Packaging
- Overwrap / Stretch Film / Cling Film / Shrink Film / Spiral wrap
- Plastic Liners for Cartons
- Polyethylene Sheets on Rolls such as table covers
- Personal care products e.g. gloves, shoe covers, aprons, disposable personal care products
- Bags for packaging bread, rolls, sweets and all bakery items
- Plastic bags for seedlings
- Pharma & Health
- Chemicals & Petrochemicals / Fertilizers
- Food processing

Applications

PE Garbage Sacks

Personal care

BOPP cigarette packing

BOPP Bread Bags

Please find our suggestions for defining the single use plastics in India and we suggest that instead of banning the use and manufacturing of single use plastic in India, it should be made compulsory that the single use plastic should only be made and used only if they are Oxo-Biodegradable complying to ASTM D-6954 Norms.

We can refer to EMIRATES CONFORMITY ASSESSMENT SCHEME OXO-BIODEGRADABLE PLASTIC OBJECTS ACCORDING TO UAE STANDARD 5009: 2009 which was adopted from ASTM D-6954 norms.

We suggest that a directive should be made to classify single use plastic and its use.

Below are our suggestions.

Plastics manufactured with modified natural polymers, or plastics manufactured from bio-based, fossil or synthetic starting substances are not naturally occurring and should therefore be addressed by this Directive.

In order to clearly define the scope of this Directive the term single-use plastic product should be defined. The definition should exclude plastic products that are conceived, designed and placed on the market to accomplish within their lifecycle multiple trips or rotations by being refilled or reused for the same purpose for which they are conceived. Single-use plastic products are typically intended to be used just once or for a short period of time before being disposed off. Pre-wetted wet wipes for personal care and domestic use should be within the scope of this Directive, whereas industrial wet wipes should be excluded. To further clarify whether a product is to be considered a single-use plastic product listed in the Annex, the Commission should develop guidelines on single-use plastic products. In view of the criteria set out in the Annex, examples for food containers to be considered as single-use plastic products for the purposes of this Directive are carry bags, garbage bags for domestic use, garbage bags for medical use, milk and milk product pouches, ice-cream cups, other disposable applications like glasses, cups, plates used in parties like PP and PS and PS foam other packaging material like bread packaging and other such food packing, fast-food containers or meal, sandwich, wrap and salad boxes with cold or hot food, or food containers of fresh or processed food that does not need further preparation, such as fruits, vegetables or desserts. Examples of food containers that are not to be considered as single-use plastic products for the purposes of this Directive are food containers with dried food or food that is sold cold requiring further preparation, containers containing food in more than single-serve portions or single-serve portion sized food containers sold in more than one unit. Examples for beverage containers to be considered as single-use plastic products are beverage bottles or composite beverage packaging used for beer, wine, water, liquid refreshments, juices and nectars, instant beverages or milk, but not cups for beverages as these are a separate category of single-use plastic products for the purposes of this Directive. As glass and metal beverage containers are not among the top littered plastic items, they are not covered by the measures of this Directive. However, the Commission

should evaluate inter alia caps and lids made of plastic used for glass and metal beverage containers.

Below are the list of applications list which needs to be Oxo-biodegradable according to ASTM D 6954 Standards

The regulation which needs to be made for defining the Oxo-Biodegradable single use plastic should cover the following products made of Polyethylene, Polypropylene & Polystyrene.

1. All Carrier Bags (including shopping bags, garbage bags, garment bags, and any disposable bags).
2. Milk pouches, Other milk products pouches, water pouches.
3. Courier and Security bags.
4. Mail Order Bags (Magazine and Newspaper Bags)
5. Disposable Cutlery such as plastic plate and plastic cups, plastic spoons and other cutlery.
6. Disposable tableware made out of Polystyrene like plates, cups, glasses including Foam products usually called as thermocol.
7. Polypropylene and polystyrene glasses, tea cups, trays, chocolate trays.
8. Bubble Wrap and Cushioning Packaging
9. Flower Wrap
10. Overwrap Packaging
11. Stretch Film
12. Cling Film
13. Shrink Film
14. Plastic Liners for Cartons
15. Personal Care products made of plastic materials such as gloves, shoe covers, aprons and any disposable personal care products
16. Plastic bags for seedlings
17. Polyethylene Sheets on Rolls such as table covers
18. Bags for packaging Bread, nuts, sweets and all bakery items
19. Nursery bags used by plantations.
20. Garbage bags used by hospitals

Our justification to convert the single use plastics into Oxo-Biodegradable is due to the feasibility of its implementation in India for below reasons.

1) **We would like to bring to your attention that Compostable plastic is not a feasible solution for Indian socio-economic conditions, for following reasons**

1) Compostable plastic only degrades in controlled composting conditions/ Industrial units

2) We do not have many such facilities available with Municipalities in India to degrade this kind of plastics.

3) Proper segregation of compostable waste from non-compostable plastic waste is very difficult in India because of volume.

4) Compostable plastic is very expensive as compared to regular plastic, hence its is not a practical solution when it comes to introduce it at ground level e.g.: Grocery bags, carry bags etc. (ref Report submitted by Prof S P Gautam to CPCB)

5) Compostable plastic can only be restricted to carry bags, as multilayer packaging is not possible with compostable plastic.

2) Oxo-Biodegradable plastic complying to ASTM D-6954 Standards is a suitable solution for the following reasons.

1) Oxo-Biodegradable plastic degrades in any kind of conditions like littering, landfill and anaerobic conditions, without requirement of any artificial degradation condition or facility.

2) Uses natural resources to degrade and emits no hazardous remains, only converts into biomass H20, Oxygen and CO2.

3) Most cost effective solution for degrading plastics. Hence can be introduced at ground level applications like grocery bags etc as it does not increase much cost.

4)Complies to food safety norms and does not contain heavy metals, hence safe to be used in packaging of food articles.

5) Can be used in Laminated packaging as well as milk and milk products packaging.

6) Oxo-Biodegradable solutions also work beautifully in Rigid applications.

7) For Indian climatic conditions Oxo-Biodegradable plastics are best suitable.

8) 100% Recyclable

9) Does not disturb any social arrangement like employment, manufacturing process etc..

10) Achieves all the properties as compared to current properties that a polymer provide for perfect packaging option.

11) Lot of international centers and scientist have done detailed study on this technology and have recommended use of this technology.

12) Lot of countries have implemented the use of Oxo-Biodegradable plastics.

13) We have got our films tested in Indian Labs for Bio-Degradability and food safety, and have got certificate for the same.

14) On same lines other packaging materials like milk and water pouches can also be converted into biodegradable which can help to reduce the volume of waste generated by plastic waste.

Single Use Plastics

Communication by

Shri Vikram Bhanushali
Indian Compostable Polymers
Association (ICPA)

Honourable Members of The Expert Committee,

We introduce ourselves as **Indian Compostable Polymer Association (ICPA)**, registered vide **registration number SL No: 391/2018 Under Section 10 Of The Tamil Nadu Societies Registration Act, 1975. ICPA** is a focal industry body for **Compostable Polymers Industry** in India. It is a non-profit association administered mainly by members of the industry who have been **duly certified by CPCB** to manufacture and **sell Compostable Plastics** products, the list of the current quorum of Members is attached therein to this letter in **Appendix A.**

We welcome the proactive initiative by the Government to tackle the burgeoning ill-effects of the pollution caused by the use of single use plastic products. **ICPA** submits herewith the list of Single Use Plastics of the products mentioned in the attached **Appendix B** of this letter along with its recommended alternative eco-friendly materials that can be used in lieu of conventional Non-biodegradable alternatives.

ICPA members consists of renowned multi-national companies, research experts, dedicated converters and renowned technocrats from the industry having decades of experience in bringing forth material solutions that compliance to International Standards (**EN13432, ASTMD6400**), Certified, globally accepted, and integrate with the current regulations of waste management.

Compostable Polymers also called as Biopolymers or **Bioplastics** are an emerging new generation of materials globally, which not only **give similar** functionality to the products to that made by conventional plastics but have a **short "End-Of-Life" period**, meaning that the products **decompose to harmless by-products** unlike conventional materials which **take centuries to degrade**. This not only prevents accruing of waste generated by **single use** products **but also supports Organic Recycling** and **Circular Economy**. Please check the attached **Appendix C** mentioning all the advantages of the use of Compostable Plastics.

Compostable Plastics are **clearly defined in the point 3(e) PMW Rules, 2016** and **SOP-Rule 4(h)** for PWM Rules 2016 are clearly laid down for established certification standards as per **IS/ISO17088** for compostable plastic product manufacturers and sellers.

- The highest component of waste generated is organic waste (**more than 45%**, Ref: **http://icrier.org/pdf/Working_Paper_356.pdf**). Organic Waste is a valuable resource if it can be scientifically processed / Composted.
- Composting offers a reduced material carbon footprint, which prevents greenhouse gas emissions and combat climate change by:
    - Entering the natural carbon cycle by using renewable feedstock.
    - Carbon sequestration.

It can generate large quantities of valuable compost which can then again be utilised for usage such as **soil amendment & rejuvenation, for e.g. as fertilizer in agriculture**. Currently the wet waste /organic waste is mixed with dry waste / non-biodegradable materials & landfilled as the waste carriers such as plastic containers and **non - biodegradable trash bag** makes it impossible to segregate and also prevents effective recycling of the plastics themselves as its contaminated with organic/food waste.

ICPA, as the forerunner association of compostable polymers thereby **submits its recommendation** to the honourable experts committee as follows:

1. Allow use of **Certified Compostable Plastics** as an Alternative to **Single Use Plastic Products** (As Mentioned in Appendix A).
2. **More effective enforcement** of segregation of Dry & Wet/Organic Waste (compulsorily to be collected in **compostable trash bags** having a **Standard Dedicated colour code for Easy Identification**).
3. **Invest in development of an Organic Waste Recycling Ecosystem**. Install Organic recycling plants / Composting infrastructure for processing of wet waste stream packed and discarded in compostable material, for e.g. Containers, Trash Bags/Bin Liners, Carry Bags, cups, glasses, etc., made out of **certified compostable polymers.**
4. **Strict Enforcement of Anti-Littering Laws.**
5. **All products** made from **Oxo-Degradable/Oxo-Biodegradable/Photo-Degradable** should be **completely banned** as it leads to the generation of **dangerous "micro-plastics"** upon degradation and are being banned globally for use. Please see the Report from Ellen MacArthur Foundation attached in **Appendix D.** There are detailed scientific reports available on various studies on oxo-degradable plastics and can be submitted if required.

To make Compostable Plastics as a robust alternative to single use plastics, **ICPA** recommends that a sustainable ecosystem needs to be established **from manufacturing to End-of-Life** by implementation of the following:

1. **Certified Compostable Raw Materials** are expensive to produce compared to conventional plastics. **Lowering of Import Duties / GST on Certified Compostable Raw Materials /** Products shall make it more attractive to consumers, encouraging its use and hence move away from non-degradable petrochemical based plastics.
2. **Encourage Investment in Implementation of Large-Scale Industrial Composting Units. Indigenous development** of technologies for Large Scale Composting Units to be encouraged under **Make in India** Program by means of **subsidy incentive** or **Technology Transfer of established technologies from overseas** to be supported after technical due-diligence by an expert committee and **incentivising it by subsidies** such as **lowering or nullifying import duties.**
3. **ICPA** intends to partner/collaborate Government to create a **Business Case by value addition of the generated compost,** which will then have **commercial value** for its use such as **soil-enriching conditioner / organic fertiliser** that can be used **instead of Chemical Based Fertilisers thereby reducing its use which will prevent loss of soil fertility.**
4. In continuation to point No.3, **a percentage of subsidy to Chemical Fertilisers** can be **allocated to Organic Compost Fertilisers** thus **supporting organic recycling industry.**

By implementation of the above recommendation, major advantages are envisioned by the use of **certified compostable biopolymers** such as:

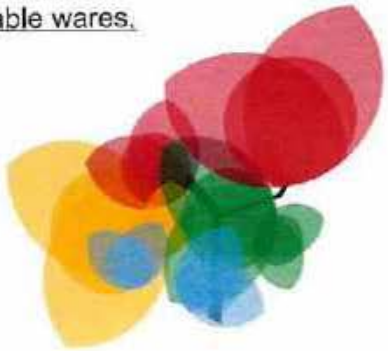
1. **Sustainable cycle** from production to organic recycling of products and generation of **Organic Compost** as a By-Product.
2. **No accruing of waste** of overwhelming quantity of waste generation **leading** to Landfill Mounds.
3. **Re-use of land** used for collection of organic waste by **off-take** of value-added compost generated.
4. **Generation of Employment** due to establishment of both centralised and de-centralised **industrial composting units.**
5. **Businesses and Employment** can be sustained by simply switch-over from conventional to compostable plastics.
6. **No Large Capital Expenditure** required for processing compostable plastics. Compostable plastics can be processed on **conventional machines** with only change in material and minimal changes in equipment.
7. **Large Scale Reduction** of **"Contaminated Non-Biodegradable Dry Waste"** which means **cleaner** conventional plastics dry-waste stream **leading to effective and efficient recycling of conventional plastics.**

Certified Compostable materials are one of the **best** alternative materials available against conventional non-biodegradable plastics which **are not only eco-friendly** but also support circular economy helping complete the nutritional loop. **It's an established family of material** in developed countries **but it's an evolving ecosystem of materials in India.** Certified Compostable **Biopolymer** products are globally recognized as an alternate solution to the conventional non-biodegradable plastics and various countries have regulations with these alternatives for solid waste management.

Appendix B: Single Use Plastics Applications, Current Materials and Alternatives				
Sr. No.	Application	Current Material Used for Application	Alternative Recommended	Remarks
1	Organic Waste Bags,/Garbage Bags for collecting Kitchen Waste or Wet Waste.	LDPE, LLDPE, Recycled PE/LDPE/LLDPEH DPE/ HMHDPE	Certified Compostable Biopolymers	Application used mainly for wet waste/organic waste/kitchen disposal. Generally goes to landfill resulting in a mixture of mixing of degradable waste in non-degradable material. Leads to build-up of gases such as methane. Trash Bags contaminated with food and other organic waste cannot be recycled unless cleaned hence involves additional processes to clean. Whereas, trash bags made with Certified Compostable Biopolymers can be disposed together along with organic waste to composting facilities since both the content and the container are Certified Compostable resulting in End-of-Life cycle for both the waste and the bags containing it. Results in generation of compost which can be used as soil conditioners.
2	Plastic Carry Bags/Grocery bags, Fruit & Vegetable (F&V)Bags, Plastic shopping bags (Typically D punched handle bags used in Garment shops)	LDPE,LLDPE,Recycled PE/LDPE/LLDPE/ HDPE/ HMHDPE	Certified Compostable Biopolymers, Paper Carry Bags, Cloth Bags, Certified HOME Compostable F&V bags (Food & Vegetables)	Application principally used for Single Use and discarded. Again goes in landfill. F&V / Kirana bags are consumed a lot for packaging grocery / fruits - vegetables. Normally they are consumed once & later used as a garbage bag. Same bags if done in Certified Compostable can be used to collect organic waste & further composted. Globally many countries have regulations to use only Certified Compostable bags for carrying Fruit & vegetables / Kirana.
3	Plastic Cups (Tea cups), Plastic tall cups (glasses), Hot & Cold Beverage cup Lids (Made up of PS/ PP/ PET)	Thermoformed PS/ PP/ PET	Cups made from Certified Compostable Biopolymers, Paper glasses laminated with Certified Compostable biopolymers. Reusable cups made from glass, Earthen Cups (Kulhad)	Maximum Utility time is 1-5 minutes after which discarded. Very Low weight for for effective collection. Prone to littering. Cannot be recycled without cleaning. Contaminated with food. Mainly goes into Landfills.
4	Plastic Straws	Polypropylene	Certified Compostable Straws, Paper Straws	maximum Utility time is 1-5 minutes after which discarded. Very Low weight for for effective collection. Prone to littering. Cannot be recycled without cleaning. Contaminated with food. Mainly goes into Landfills.
5	Plastic cutlery, Plastic take away containers, Plastic thermoformed products like Trays, Bowls, Plates, containers, lids etc (Made up of PS/ PP/ PET)	Polypropylene, Polystyrene, Oxo-Degradable polymers	Wooden cutlery, Certified Compostable Plastics cutlery, Bagasse based products.	Single use and requires to be food contact approved. Difficult during segregation. Cannot go into PE recycling stream. Most of the waste is food contaminated, hence not accepted by recyclers. Segregation difficult due to identification of material of the products especially in black. Doubt on the Food Grade properties of the materials.
6	Secondary Packaging liners, E-Commerce Packaging Bags.	LDPE/ LLDPE/ HDPE/ HMHDPE	Certified Compostable films as liners	Can be collected and composted to close the loop.

7	Milk Pouches	LLDPE/LDPE	Certified Compostable Biopolymers	Milk pouches used extensively is a one-time usage application and end up in landfills as cannot be reused. Yes there is a challenge to ensure food grade standards and that the packaging properties required for this application is maintained. But definitely an alternative that the even the milk industry is looking for.
8	Oxo-Degradable Carry bags, trash Bags, grocery bags	Oxo-Degradable Polymers	Certified Compostable Biopolymers, Cloth Bags	Products made from Oxo Degradable is marketed as Bio-Degradable products which in-fact degrade into micro-particles and enter food chain and water by various channels which is much more harmful than large plastic pieces. Such products shall be made with Certified Compostable Biopolymers as they degrade into non-toxic material.
9	Non-Woven Bags	Polypropylene	Certified Compostable Biopolymers, Cloth Bags, paper bags	Made of polypropylene. Does not Degrade hence go into landfills. Have to be separately segregated for PP Recycling
10	Sapling Bags/Nursery Bags	Polyethylene, recycled Polyethylene	Certified Compostable Biopolymers	Nursery Bags/Sapling Bags are discarded after sapling plantation in the surrounding areas and largely are not recovered. Often the saplings are planted along with the nursery bag which depletes the soil quality and also harmful for the plants. Certified Compostable Bags degrade to create compost which is also a soil conditioner. Such bags can be discarded and collected for compost to reuse for the same nursery/ forest region.
11	Mulch Films	LDPE,LLDPE,Recycled LDPE/LLDPE	Certified Compostable Biopolymers	Though this is not a Single Use Applications, much of the Mulch Films manufactured is from recycled PE from all the other single use application. Issue with this application is that they are burnt after their use or after it gets shredded during its life cycle. Secondly if not burnt, the shredded parts mix with the soil resulting in deterioration of soil quality over time. China lost substantial agriculture land due to "white pollution" which was a resultant of use of plastic mulch films. Certified Compostable materials on the other hand provide compost upon degradation conditioning the soil. Shredded parts of Mulch Films mix with the soil thereby affecting its fertility and water retention.
12	Garment bags	BoPP (Polypropylene)	Certified Compostable Biopolymers-transparent or translucent	Garment industry needs packaging even for their storage in shops as dust and pollution spoils new garments, however the number is huge and can be converted to compostable biopolymers
13	Hand gloves general purpose	PE/Rubber	Certified Compostable Biopolymers-transparent or translucent	medical gloves cannot be reused/recycled etc. It goes in to medical waste and then either burnt or filled in land so closest alternative is to move to certified compostable.
14	One-time shampoo sachet	Multilayer packaging	Certified Compostable Biopolymers	However, this small sachets should be banned as collection is almost impossible.
15	Packing bags in railways for blankets	PE	Certified Compostable Biopolymers, paper bags	Currently paper bags are also used for this application. However, if Compostable Bags are used it can serve Dual Purpose of both the Blanket bags and also as Organic Waste Bag/Trash Bag in Railways.
Note:	All the above applications can be very well replaced with compostable plastics and this implementation can be successful **ONLY if** its waste management is done by **Organic Recycling by Industrial Composting Facilities.** This will **create a** sustainable Ecosystem for Circular Economy. Organic Recycling Plants for Compostable Plastics are what recycling plants are to conventional plastics, generating value added compost as product in the end. Hence for successful implementation of alternative materials such as Compostable Biopolymers in Single Use Plastics (SUP), implementation of **Industrial Composting Facilities** is a must to close the loop from Manufacturing to End-of-Life.			

Certified Compostable Polymers as an sustainable Solution to single use plastic carry bags, table wares, garbage bags, grocery bags



About Us:

- Represents passionate individuals, organizations - committed to bring awareness about bioplastics & contribute to a resource efficient & sustainable future.
- Apex industry body representing **raw material manufacturers, converters, distributors committed to the appropriate usage of bioplastics for resource recovery**
- **Indian Compostable Polymers Association is supported by:**
  - **European Bioplastics Asso. (EU nations)**
  - **Pan Pacific Bioplastics Alliance (includes Associations of Thailand, Japan, Korea, Taiwan, Malaysia, etc.)**
  - **Australasian Bioplastics Asso (Australia, New Zealand)**
  - **Biodegradable Products Institute (USA)**
- Advisor & Consultant - Prof. Ramani Narayan, Michigan State University
- It will ensure a strict Code of Conduct, signed by Members, to ensure appropriate communication and marketing of bioplastics

What are Certified compostable plastics?

What are Certified Compostable Plastics? -

- Compostable plastics – Compostable plastics are materials which undergoes degradation by biological processes during composting to yield CO_2, water, inorganic compounds and biomass at a rate consistent with other compostable materials
- Compostable materials are niche products in the plastics portfolio that offer new properties and application possibilities
- Compostability (and therefore biodegradability) is assured as that material or product has passed all relevant tests to the various Standards globally (ASTM D6400, EN13432) including India as per CPCB norms of IS ISO 17088 as per Plastic Waste Management Rule 2016 (PWM 2016)
- Biobased materials
- Simple field tests are available to detect compostable plastics

Diverse applications of compostable plastic – Single Usage items

Problems / Opportunity

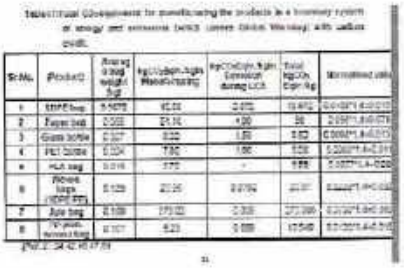
Problems

- Food waste is a universal problem – (post production food waste)
- Food waste is organic and has high water content
- Landfilling of organic waste is condemning useful resources to oblivion
- Food waste and green waste in landfills are generally compacted, which removes oxygen.
- The material subsequently breaks down anaerobically (without oxygen) which releases methane, a potent greenhouse gas
- Methane is 25 times more potent than carbon dioxide*
- In addition, the breakdown is slow, creating a problem for future generations

Opportunity

Example – Compostable Carry bags - show clear advantages

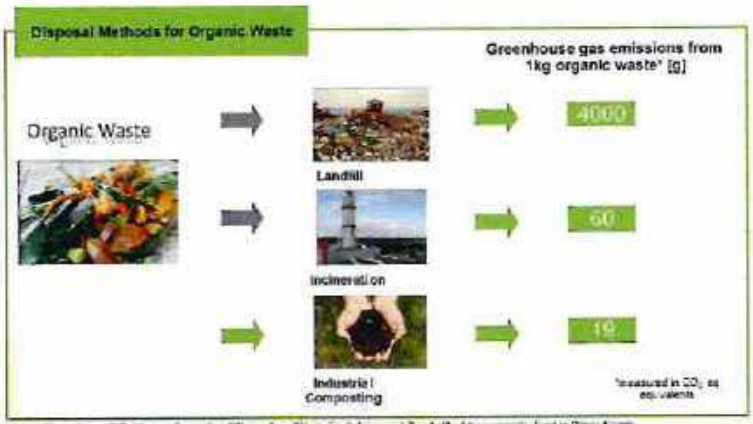
LCA – Compostable Carry bags - show clear advantages
Source:http://cpcb.nic.in/pwm-publications/



Highlights of the study:

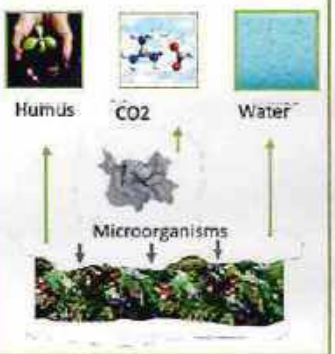
- Energy eq. in terms of CO2 for biopolymers (PLA) is less than petrochemical polymers
- Biopolymers require less energy requirements than PP
- Biopolymers enable energy savings of around 20% energy & CO2 emissions
- Acidification potential of PLA can be reduced to a significant level of 100% on composting

Composting is sustainable than landfilling



Organic recycling thru composting supports soil amendments & increase yield

Composting



Benefits

Compost:

- is a great source of plant nutrients
- increases soil workability and water holding capacity.
- serves as a marketable commodity.
- is a low cost alternative to standard landfill cover and artificial soil amendments.

Compostable Plastics economics

Attributes	Conventional plastic materials	Certified Compostable Plastics	Remarks
Functional Properties	↑	↑	• Meets strength, mechanical properties, water tightness etc. • Can be customized in combination with other environment friendly materials like paper etc.
Compostability	↓	↑	• Home, Industrial & Municipal composting possible
Value Engineering Potential	↓	↑	• Huge potential for value engineering to adapt to numerous applications • Products can be designed to serve - rigid, paper coating, films etc.
Environment Impact	High	Low	• Supports reducing CO2 emissions by diverting organic waste from landfills • Enables circular economy & completes the nutrition loop
Cost Economics	↑	↓	• Made from renewable resources, so current cost are high, capacity investments & leveraging will help bring cost down
Processing ease	↑	↑	• Compostable plastics can be processed on conventional plastic processing equipments, hence no job Losses in the existing plastic industry due to implementation of plastic ban. • Technical advantage

The beneficial cycle for food waste – enabled by Compostable Plastics

Environmental Benefits

- Supports effective management of scarce materials such as soil nutrients via composting;
- Offers a reduced material carbon footprint, which allows savings of greenhouse gas emissions and combat climate change by
  a) entering the natural carbon cycle by using renewable feedstock
  b) carbon sequestration through composting;
- Is a certified non-toxic, harmless material, which makes it suitable for biological waste treatments

Social Benefits

- Supports "zero-waste" projects and resource efficiency as designed for multiple end-of-life options
- Supports social fairness by encouraging a sustainable supply of renewable materials and driving social responsibility programs in emerging regions

Technical Benefits

- Offers innovative solutions where existing recycling methods are cumbersome and difficult to implement
- Facilitates the return of nutrients to the soil thru the process of composting
- Can be processed on conventional machines

Single Use Plastics

Communication by

Shri Mahendra Patel
Plastics Machinery Manufacturers
Association of India (PMMAI)

Subject – Single Use Plastics Ban - Representation for EPS Disposable

We strongly endorse the effort and implementation of Government of India for Swachh Bharat and Make in India initiative. We are writing this letter with goal to introduce EPS products and clear some general misconception regarding the same, so as to make informed decision in drafting of any further policy regarding inclusion of EPS in Plastic Ban of Single Use Plastics.

EPS or XPS (Expanded polystyrene) Disposable is basically polystyrene which is chemically inert and eco-friendly product. Basically, it is nothing but expanded form of the polymer i.e. polystyrene with 98% Air and 2% Polystyrene within it and thus it is light, very easily transportable and cost savvy. EPS is used in many industries and packaging is one of them manufacturing plates, bowls and cups for dispoware items.

- Only 2% PS and 98% air – Least amount of plastic used to convey the same utility compared to any other product
- No CFCs or HCFCs or other harmful gases
- Good hygiene value
- Inert material and non-toxic.
- Doesn't react with soil and water
- Doesn't liberate any harmful gases on own
- Can be reprocessed to generate polystyrene
- Can be dry compacted into bricks and sent for recycling – volume advantage, transport benefits, fuel source.

Pollution

Pollution due to Pulp and Paper production is 3rd highest in India and the contribution to pollution is summarized below:

Particulate	: 4%
Sulphur	: 15%
Nitrogen	: 11%
Surface water	: 19%

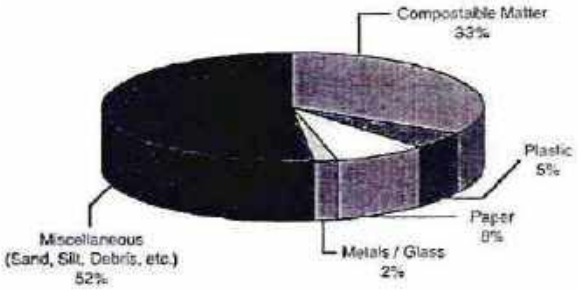
It is strange, yet Paper and paper recycling is perceived as environment friendly!

THE COMPOSITION OF MUNICIPAL WASTE AND PLASTICS AND WASTE DISPOSAL:

It is estimated that around 26000 tonnes/day of total plastic waste is generated in India comparing this to EPS industry in India which at full capacity can manufacture around 250-300 tonnes per day around even considering zero recycle it is around **0.01%** of total waste generated.

As reference to study and understand, we consider the preliminary findings of a study conducted by the Central Pollution Control Board (titled as "Assessment and Quantification of Plastic Waste in 60 major cities" indicate that Plastic wastes constitute approximately 10-15 % of the municipal and solid waste generated in a city, including multilayered and metalized pouches. However, after the generation of the Plastic waste, the waste pickers collect a considerable quantity of Plastic waste for selling to the waste dealers who ultimately resale those to actual recyclers. Ultimately only about 5 to 7% Plastics wastes only reaches the landfill – as per NEERI Study in Mumbai after the Mumbai Deluge in 2005.

Percentage of quantities in the waste at Goral (landfill in Mumbai)



And if the items under disposable plastic only are taken into consideration then the percentage of the disposable plastic under total municipal waste would be insignificant.

EPS is fully recyclable and Foam waste can also be melted and converted to General Purpose Polystyrene (GPPS) pellets –which are further used to manufacture products such as beads/bangles, coat hangers, stationery items, etc. It has to be considered that the Plastic in the form of EPS DISPOSABLES not only qualify all parameters of the effective waste management viz **reduce, reuse, recycle** but also one more important attribute which is **'Recover'**. This means that at the end of the intended life of the product, we should be able to recover the energy from the waste. Plastics have more calorific values than even coal.

COMPARISON OF EPS TO PAPER DISPOSABLES:

Following table comparing the EPS disposable Articles/glasses vis a vis paper disposable Articles/glasses may kindly be referred to.

Item	Paper Disposable Item	EPS Disposable Item
Industry categorization	Under Paper industry is placed Red category under MOEF notification	Plastic industry is placed under green category under MOEF notification
Making the cups (per cup) Mass of wood and bark needed (g)	33	0
Mass of petroleum needed (g)	4.1	3.2
Mass of other chemicals needed (g)	1.8	0.05
Per Metric Ton of Material		
the material whose manufacture uses the most Steam (Kg)	✓(9000 to 12000)	0
Electricity (Kwh)	✓ (980)	150
Water Effluent (ltr)	✓ (190000)	2000
Suspended Solids (Kg)	✓ (60)	Trace
BOD (Kg)	✓ (50)	0.07
Organochlorines (Kg)	7	0
Air Emissions Chlorine(Kg) Chlorine Dioxide(Kg) Reduced Sulfides (Kg) Particulates (Kg)	✓ 0.5 0.2 2.0 15	 0 0 0 0.1
Mass of 1 cup (g)	10.1	1.5
After use Can the cup be reused?	✗	✓

Can the material be recycled?	X	✓
Can it be burnt?	✓	✓
How much energy will we get from 1 kg if we burn it?	20 MJ	40 MJ
What mass of material would go in a landfill from 1 cup?	10.1 g	1.5 g
* What mass of detergent would go in a sewer if we use steel or glass in place of plastics=5-10 gram of detergent per use which will contaminate water permanently and will also cause pollution to rivers and underground water table.		
*What is most significant to appreciate that the paper cups/glasses cannot hold water or other liquid items unless it is quoted with thin layer/film of plastic in its internal side. Such mixing of thin film makes such paper cups extremely difficult and economically not feasible/ completely unviable from economic standpoint for recycling.		

Paper versus Polystyrene : A Complex Choice Author(s): Martin B. Hocking
Source : Science, New Series, Vol. 251, No. 4993 (Feb. 1, 1991), pp. 504-505
Published by : American Association for the Advancement of Science
URL : http://www.jstor.org/stable/2875063

INDUSTRY SCENARIO

There are about 50-60 manufactures of EPS disposables across India. Apart from this other ancillaries like corrugated box industry, polybag industry, Tape and various tooling factories are supported heavily by EPS Disposable industry. Facts and figures of Disposables of Disposables Manufacturer are given as under.

- **Total Capital Investment about** – Rs 1500 Cr
- **Bank Funding about** – Rs 400 - 500 Cr
- **Employment by manufacturers direct and through contractors** – Approx. 15000
- **Employment through the trade channel, namely distributor-dealer-retailer-shopkeeper** – Approx. 190000-200000. If the entire Supply Chain system is taken in consideration including raw material suppliers, packaging material suppliers, transporters, machine manufacturers, the figures will be much higher
- **Yearly Turnover about** – Rs 2000 – Rs 2500 Cr
- **Yearly GST Revenue about** – Rs 350 – Rs 450 Cr

INDUSTRY SUGGESTION AND PRAYER TO THE COMISSION

- ***Instead of banning the use and manufacturing of EPS Disposable items it can also be manufactured with Oxo –Biodegradable additive which make the product confirm to***

ASTM-D6954 standard that Degrade in the Environment by a Combination of Oxidation and Biodegradation.

- *Each and every EPS Disposable manufacturer has already recycling facility in their premises as while manufacturing the product about 20% material is recycled and used in the process. EPS Disposable manufacturers are ready for EPR (Extended Producer Responsibility) i.e. to recycle the waste of EPS Disposable if the waste of EPS Disposable is collected and delivered to EPS Disposable manufacturer's factory premises.*

As reviewed above the properties and attributes of EPS disposables item, making it ideal to use compared to the touted alternative products made of paper, and considering the considerable capital investment of industry by MSME businessmen's, we request to take into consideration about our industry in a positive way. We request you to provide us with an opportunity for a meeting to further discuss regarding information and possibilities to cater the environment and people of our country at the best.

Single Use Plastics

Communication by

Shri Mahendra Rustagi
All India Laminated Fabric
Manufacturers Association (AILFMA)

We, All India Laminated Fabric Manufacturers Associations, are represented by the manufacturers of Laminated Fabric/Flex Banner. There are about 17 Units in India manufacturing laminated fabric/flex banners. Total capital investment made by these Units is more than Rs.2500 Crores and in addition to significant contribution to the government exchequer, these units offer direct and indirect employment to more than 2,00,000 people.

We understand that an Expert Committee is in the process of framing rules/guidelines defining Single Use Plastic (SUP). Flex Banner are neither short life PVC product nor SUP considering its usage/multiple re-usage/fully recyclability. Even as per the United Nations Environment Programme (UNEP) Report, Flex Banner is completely out of purview of the definition of SUP. We would like to submit few facts and findings, for your kind consideration:

1. **Findings of Expert Committee of MoEF on Short Life PVC.** On the advice of NGT, MoEF has formed a Technical Committee on Use of PVC in all packaging, hoarding/banners, use-and-throw and short-life-items. The Committee has finalized its final draft report (copy enclosed) based on which MoEF will issue final guidelines on use of use-and-throw and short-life-items. We understand that the report has been submitted to NGT. **Nowhere in the final draft report of the Expert Committee, Flex Banner has been found as use-and-throw or short-life- PVC item.**

2. **UNEP REPORT on Single Use Plastic**

   In the Report "Single-Use-Plastics: A Roadmap for Sustainability" published by the United Nations Environment Programmes (UNEP) in 2018, the flex banners have not been identified as single-use-plastic materials. The items covered under single-use-plastic materials (in page No.2) are; Grocery bags, Food packaging, Bottles, Straws, Containers, Cups, Cutlery.

3. **Life Cycle Study of Flex Banner by IIT Delhi**

   'Life Cycle Study of Flex Banner and its Impact on the Environment' 2018, a report of IIT Delhi (copy enclosed) published by Foundation for Innovation and Technology Transfer (FITT), IIT Delhi, clearly indicates that;

REUSAGE

- Flex Banner clearly **belong to the category of B2B products**. After their usage, they carry an economic value as they can be reused as tarpaulin, roof covers, truck covers, rickshaw covers, food grain covers, bags, sitting mats etc."
- **Flex Banner is fully recyclable** wherein the constituents are separated by means of a mechanical shredding process. The PVC compound can be utilized for flooring and manufacture of footwear, geotextiles etc. while the shredded polyester fabric can be used as soft fillers in the mattresses and pillows.
- **Flex Banner inflammable** - Lab trials as well as international research articles have clearly stated that PVC by itself is self-extinguishing when the source of the flam is removed. In the event of the ignition of PVC during an accidental fire, it mainly contributes in extinguishing rather than spreading the fire
- Due to the self-extinguishing property, flex banners do not sustain burning which in turn **eliminates the possibility of dioxin generation.** Even during the production, the processing temperature of PVC does not exceed 200 degree centigrade which is much below the threshold temperature."

4. **Use of Plastic Waste in Road Construction & Road Furniture.**

   - The Government of India had recently issued guidelines encouraging the use of plastics waste, including PVC waste, for laying roads. The Central Road Research Institute (CRRI) has been conducting research on the usage of scrap of flex banners for bituminous road construction.

   - CRRI has also successfully completed research on use of Flex Banner waste in Road Furniture

5. **PVC Flex is not a consumer product and therefore, do not get into the cycle of household waste and landfill.**

   - The Solid Waste Management Rules 2016 also do **not recommend banning** PVC Flex. The product also satisfies in terms of thickness the MSW disposal rules of being above 50 microns as the PVC Flex is generally with thickness between 200 – 600 microns. It is broadly estimated that PVC content in the municipal solid waste does not work out to >0.5% (copy enclosed).

   - **The PVC waste generated from the Flex banners is nearly negligible** i.e. even assuming zero reuse and recycling of flex banner, it is only 0.005% of the total PVC consumption in India. It is thus apparent that it cannot create any challenging problem.

- **As it is, post usage for advertisement it is reused as Tarpaulin, Shanties cover, making bags, making granules for reuse in the shoe soles etc.** Many downstream cottage industries consume once used flex banner. Thousands of workers, whose industries include small bag and purse making, lining, seat covers, labour sheds, rain protection for workers and economically weaker sections, etc., depend on availability of used flex. In view of this Flex Banners are not found in landfill.

6. **PVC Flex Banner is the main medium used by signage industry all across the world** including countries like USA, Europe, Middle East, Far East, Latin America, Australia, China, Japan etc. These countries are zero tolerant so far as environmental pollution is concerned. We are exporting our products to many of these countries.

7. **Extended Producers Responsibility (EPR)**

   - Presently, 100% of the waste after reuse, are recycled in the organized and unorganized sector.

   - We as a responsible Corporate, are fully committed to honour Extended Producers Responsibility (EPR) for which the Rules could be framed for 100% compliance. The EPR should not only be extended on the domestic players but it should also be equally applicable on the importers.

Annexure IV

Implementation of Plastic Waste Management (PWM) Rules, 2016 and Plastic Waste Management (Amendment) Rules 2018 in different States

Implementation of Plastic Waste Management (PWM) Rules, 2016 and Plastic Waste Management (Amendment) Rules 2018 in different States

Technology advancements and global digitalization has resulted in augmentation of resource consumption, especially light weight and convenient materials, Plastics. This paradigm-shift from traditional metals, ceramics and paper to plastics in all sectors of life has been generating millions of tonnes of waste, which are irresponsibly dumped in landfills, roadsides and aquatic/marine habitats as well. This trend is expected to continue because of proposed exponential growth in plastic production in the next 10 – 15 years [Report on 'Single use Plastics: A roadmap to sustainability' by United Nations Environment Programme, 2018]. In order to cope with the plastic waste, we need to remodel its manufacturing, usage and management. It has to be a combined effort of governments to regulate, businesses to innovate and individuals to act, for tackling one of the biggest environmental menaces.

1.1 Salient features of PWM 2016

[Source: Published in the Gazette of India, Part-II, Section-3, Sub-section (i) by Ministry of Environment, Forest and Climate Change, New Delhi, on 18th March, 2016, as amended 27th March, 2018]

Plastic waste management: General Guidelines

- Recyclable Plastic Wastes, shall be channelized to registered plastic waste recycler and recycling of plastic shall conform to the Indian Standard: IS 14534:1998 titled as Guidelines for Recycling of Plastics, as amended from time to time.
- Local bodies shall encourage the use of plastic waste, preferably those which cannot be further recycled for various applications such as Road Construction as per Indian Road Congress guidelines; Energy Recovery; Waste to oil etc.
- Rural areas have been brought in the realm of these Rules since plastic has reached rural areas also, wherein the responsibility for implementation of the rules shall lie with Gram Panchayat.

Responsibility of Central / Local Bodies

- Central Pollution Control Board (CPCB) has been mandated to formulate guidelines for plastics difficult to recycle (thermoset plastics). Previously, there was no such provision.
- State Pollution Control Boards (SPCBs) will not grant/renew registration of plastic bags, or multi-layered packaging unless the producer proposes the action plan for recycling / waste management, endorsed by the concerned State Development Department.
- Every gram panchayat either on its own or by engaging an agency shall set up, operate and co-ordinate for waste management (segregation, collection and transport) in the rural area under their control, while creating awareness and preventing any open incineration of plastic wastes.

- Every local body shall be responsible for setting up of plastic waste management system and infrastructure for segregation, collection, storage, transportation, processing and disposal of the plastic waste. They shall seek assistance of producers and such system shall be set up within one year from the date of final publication of these rules. They shall also frame bye-laws incorporating the provisions of these rules.

Responsibility of Producers, Importers and Brand Owners

- Primary responsibility for collection of used multi-layered plastic sachet or pouches or packaging is of Producers, Importers and Brand Owners who introduce the products in the market under Extended Producer Responsibility (EPR). They have to formulate waste management system within the prescribed timeframe, in association with the local bodies / State Urban Development Departments. The plan of collection to be submitted to the SPCBs while applying for Consent to Establish or Operate or Renew.
- Producers shall keep a record of their vendors to whom they have supplied raw materials for manufacturing carry bags, plastic sheets, and multi-layered packaging to curb manufacturing of these products in unorganized sector.

Responsibility of Waste Generators

- All institutional generators of plastic waste, shall segregate and store the waste generated by them in accordance with the Municipal Solid Waste (Management and Handling) Rules and handover segregated wastes to authorized waste processing or disposal facilities or deposition centers either on its own or through the authorized waste collection agency.
- Individual and bulk generators like offices, commercial establishments, industries are to segregate the plastic waste at source, handover segregated waste, pay user fee as per bye-laws of the local bodies.
- Every person responsible for organizing an event in open space, which involves service of food stuff in plastic or multilayered packaging shall segregate and manage the waste generated during such events in accordance with the Municipal Solid Waste Rules.
- Take steps to minimize generation of plastic waste and segregation of plastic waste at source in accordance with the Solid Waste Management Rules.
- Not litter the plastic waste and ensure segregated storage of waste at source and handover segregated waste to urban local body or gram panchayat or agencies appointed by them or registered waste pickers', registered recyclers or waste collection agencies.

Rules pertaining to carry bags, and other packaging materials including multi-layered packaging

- Carry bags and plastic packaging shall either be in natural shade which is without any added pigments or made using only those pigments and colorants which are in conformity with Indian Standard: IS 9833:1981 titled as "List of pigments and colorants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water"
- Carry bags made of recycled plastic or products made of recycled plastic shall not be used for storing, carrying, dispensing or packaging ready to eat or drink food stuff.

- Carry bag made of virgin or recycled plastic, shall not be less than 50 microns in thickness. The provision of thickness shall not be applicable to carry bags made up of compostable plastic. Carry bags made from compostable plastics shall conform to the Indian Standard: IS 17088:2008 titled as Specifications for Compostable Plastics, as amended from time to time. The manufacturers or seller of compostable plastic carry bags shall obtain a certificate from the Central Pollution Control Board before marketing or selling.
- Plastic sheet or like, which is not an integral part of multilayered packaging and cover made of plastic sheet used for packaging, wrapping the commodity shall not be less than 50 microns in thickness except where the thickness of such plastic sheets impair the functionality of the product.
- Sachets using plastic material shall not be used for storing, packing or selling gutkha, tobacco and pan masala.
- The entry points of plastic bags/plastic sheets/multi-layered packaging in to commodity supply chain are primarily the retailers and street vendors. They have been assigned the responsibility of not to provide the commodities in plastic bags/plastic sheets/multi-layered packaging which do not conform to these rules or they will have to pay the fine.
- Plastic carry bag will be available only with shopkeepers/street vendors pre-registered with local bodies on payment of certain registration fee. The amount collected as registration fee by local bodies is to be used for waste management.
- Manufacturing and use of non-recyclable multi-layered plastic to be phased in two years.

1.2 Salient features of Amended PWM 2018

- The terminologies 'Alternate Use' and 'Energy Recovery' for plastic waste have been defined
- The amended Rules lay down that the phasing-out of Multilayered Plastic (MLP) is now applicable to MLP, which are "non-recyclable, or non-energy recoverable, or with no alternate use." The amended rules, 2018 also lay down that manufacture and use of non- recyclable multilayered plastic, (*which are "non-recyclable, or non-energy recoverable, or with no alternate use) if any, should be phased-out in Two years' time.
- The amended Rules also prescribe a central registration system for the registration of the producer/importer/brand owner. The centralised registration system will be evolved by Central Pollution Control Board (CPCB) for the registration of the producer/importer/brand owner.
- A national registry has been prescribed for producers with presence in more than two states, a state-level registration has been prescribed for smaller producers / brand owners operating within one or two states.
- The Rules also lay down that any mechanism for the registration should be automated and should take into account ease of doing business for producers, recyclers and manufacturers.
- In addition, Rule 15 of the Plastic Waste Management (Amendment) Rules 2018 on "Explicit Pricing of Carry Bags" has been omitted.

1.3 Implementation of Plastic Waste Management Rules (2016) and Plastic Waste Management (Amendment) Rules 2018: State-wise observations

[Excerpts from Annual Report for the year 2017-18 on Implementation of Plastic Waste Management Rules (As per Rule '17(4)' of PWM Rules, 2016, as amended 2018, Central Pollution Control Board, November 2018]

- Arunachal Pradesh: The state with 6 MT/annum plastic waste generation has banned use of plastic carry bags. However, State Government has not constituted State Level Monitoring Committee (SLMC) and details of processing of the waste as per IRC code is not available.
- Bihar: The state with 2280MT/annum plastic waste generation has implemented SLMC while waste management complying IRC code is not available. There is prevalence of unorganized sector – plastic manufacturing / recycling units in the state, which may be curbed.
- Chandigarh: PWM Rules (2016) and amendments has been executed; Municipality Authority collects solid waste by door to door collection mechanism and transports to waste processing plant for final disposal. A proposal for converting waste plastic into oil is under consideration. However, the UT has not constituted SLMC.
- Gujarat: The state has no unregistered plastic manufacturer/recycler. Out of 269808 MT plastic waste generated per annum, 68973.25 MT are co-processed in cement plants. Marking and labelling provisions, mentioned under PWM Rules, 2016, as amended, 2018 are followed by most of the manufacturers present in the State. Stringent warnings / show-cause notices are issued to those units violating PWM Rules, 2016 and its amendments.
- Jammu & Kashmir: Even though the state has many registered plastic manufacturing / multi-layered films / recycling units, proper labelling and marking of plastic carry bags are not followed by all the manufacturers. The state has not constituted SLMC.
- Manipur: The state has completely banned manufacture, import, storage, transportation, sale and use of plastic carry bags in the State. All plastic manufacturing/recycling units in the state are not following the practice of proper labelling and marking. Violation has been reported in terms of plastic carry bags with thickness below 50 microns.
- Meghalaya: SLMC has been constituted by the state and meetings are held for reviewing the implementation of PWM Rules 2016 and its amendments. Workshops have been organized in association with CPCB with all the cement plant to promote use of plastic waste in co-processing. The state with 15.096 MT/annum of plastic waste generation has implemented partial ban on plastic carry bags.
- Madhya Pradesh: Out of 50457.07 MT/annum plastics waste generated, 4383 MT of waste is co-processed in cement plants while 2000 MT is recycled and 54 MTs is utilized in road construction. SLMC recommended implementation of PWM Rules,

2016, as amended, 2018 as amended 2018. There is no violation reported in respect of thickness of carry bags.

- Nagaland: The SPCB has constructed bitumen polymer road within office premises. The Government of Nagaland has banned use of poly bags/plastic carry bags in the State with effect from January 1, 2004. The Board Provision for marking and labelling of carry bags are followed in Kohima and Dimapur City. The State Government has constituted SLMC Body to monitor implementation of the Plastic Waste Management Rules, 2016, as amended 2018.
- Odisha: All Urban Local Bodies have been instructed to send their plastic waste (12092.205 MT/annum) to M/s ACC Ltd., Bargarh for co-processing in cement kiln. SLMC is constituted to review implementation of the PWM Rules, 2016 as amended 2018 and no violation has been reported.
- Punjab: The state has implemented door to door collection facility for plastic waste in selected locations. However, no proper segregation mechanism available and informal sectors are involved in segregation of plastic waste. Government of Punjab has completely banned use of plastic carry bags in the State.
- Tripura: There is complete ban on use of plastic carry bags, there are no registered plastic manufacturing/recycling unit in the state. There is complete ban on manufacture, import, storage, transportation, sale and use of plastic carry bags. SLMC body has been constituted by the State Government. Practice of proper labelling and marking of plastic carry bags are not followed by all the manufacturers.
- Uttar Pradesh: The state has issued complete ban on manufacture, import, storage, transportation, sale and use of plastic carry bags. Practice of proper labelling and marking of plastic carry bags are not followed by all the manufacturers. SLMC body has not been constituted by the State Government. 206733.45 MT/annum plastic waste is generated in the state.
- Uttarakhand: There is complete ban on manufacture, import, storage, transportation, sale and use of plastic carry bags in the State. SLMC body has been constituted by the State Government. There is no clear picture of waste generation during 2016-17.

Observations

The status of implementation of Plastic Waste Management Rules 2016 and its amended version, 2018 shall thus be summarized as,

- The Plastic Waste Management Rules 2016 and its amended version, 2018 focuses on regulating the production of plastic products, especially, carry bags and multi-layer packaging.
- The PWM Rules 2016 has strictly prohibited the use of plastic films below 50 µm thickness, unless in very specified applications, wherein thickness may affect the functionality of the packaged item.

- As per Extended Producers' Responsibility (EPR), Producers, Importers and Brand Owners have been made responsible for the waste produced from their products. All institutions, organizations, event management teams etc. shall frame their waste disposal systems. CPCB, SPCBs, Gram Panchayats and other responsible Local Bodies are liable to design proper Plastic Waste Management network constituting arrangements for collection, segregation and recycling the waste.

- There has been a complete ban on manufacture, import, storage, transportation, sale and use of plastic carry bags, in most parts of the country. However, most of the states have not implemented the PWM Rules 2016 and its amendment, 2018 with full effectiveness. Also, only a few states have implemented door-to-door collection and segregation of waste plastics.

Further, the following are few recommendations for further strengthening the PWM Rules and its execution, [Source: Policy Perspectives, OECD Environment Policy Paper No. 12, Environment Directorate, ISSN 2309-7841, September 2018]

- **EPR needs to be implemented effectively at the discretion of producers or in association with the ULBs with periodic regulation and review by the State Authorities**
- **Domestic policy frameworks need to be reinforced to seize economic and business opportunities in high-end plastic waste processing**
- **International tie-ups and collaborations are required to boost innovation and support improved environmental standards in the fast growing markets**
- **Facilitation of better coordination and communication across the plastics value chain, including the promotion of chemical information systems**
- **Creation of consumer education and awareness campaigns to stimulate demand for products manufactured from recycled plastics.**
- **Responsibilities of Urban Local Bodies (ULBs) as well as Waste Generators / Producers need to be defined appropriately for necessary implementation and co-ordination.**
- **Design of requirements to collect and recycle all types of plastic products and implementation of value added taxes for recycled plastics or plastic products**
- **Introduction of certification standards for recycled plastics, labelling of recycled content and restrictions on the use of hazardous additives in plastics manufacturing.**

For more details on PWM 2016, as amended 2018, please refer the Rules Published in the Gazette of India, Part-II, Section-3, Sub-section (i) Ministry of Environment, Forest and Climate Change, New Delhi, dtd. 18th March, 2016, as amended 27th March, 2018.

Annexure V

Status of Plastic bans in different states

Status of Plastic bans in different states

In compliance with the Plastic Waste Management Rules, 2016 and amendment thereof in 2018, State Governments have formulated their own policies under the garbage control act and guidelines for regulating the manufacture and use of plastics and various plastic products.

Table given below compares the status of plastic ban in various states and Union Territories

Table 3 - List of Plastic Bans imposed by various State Governments

S. No.	State	Notification date	Banned Plastics Products	Source
1.	Andhra Pradesh[3]	20.06.2013	Plastics carry bags below 40 Microns, Packaging (Sachets)	Govt. Doc
	Andhra Pradesh (Tirupati Municipal Corporation)[4]	2.10.2018	Plastic coated paper plates, thermocol plates, containers & dishes, Water bottles below 500 ml, packaging covers below 51 Micron.	News
2.	Arunachal Pradesh[5]	Ban since – 03.07.2012	Plastics carry bags below 50 microns	News
3.	Assam[6,7]	Ban since August 2018	Plastics carry bags below 50 microns	News
4.	Bihar[8]	10.15.2018	Plastics carry bags below 50 microns	Govt. Notification
5.	Chhattisgarh[9,10]	Ban since : 24.12.2015	Poly vinyl chloride and chlorine laden plastic like flex, banners and posters	News
6.	Goa[11, 12, 13]	31.07.2002 Ban since – 16.03.2015	Plastics carry bags below 50 microns	Govt. Notification News
7.	Gujarat[14]	Ban since – 28.06.2011 (for Gandhinagar)	Plastics carry bags below 50 microns (religious places i.e. at Ambati, Dakor, Somnath and Dwarka) & Gandhinagar	CPCB & news

[3] http://swachhts.cgg.gov.in/Documents/Downloads/Plastic-Waste-GO_MS46.PDF
[4] http://tspcb.tripura.gov.in /Plastic_corrigendum.pdf
[5] http://pib.nic.in/newsite/mbErel.aspx?relid=169756
[6] http://pib.nic.in/newsite/mbErel.aspx?relid=169756
[7] https://www.downtoearth.org.in/news/waste/indian-states-implementation-of-plastic-ban-a-mixed-bag-62664
[8] http://www.bspcb.bih.nic.in/wnoti.pdf
[9] https://m.economictimes.com/news/politics-and-nation/chhattisgarh-to-ban-use-of-plastic-carry-bags-from-next-year/articleshow/45011260.cms
[10] https://www.outlookindia.com/newsscroll/chhattisgarh-bans-pvc-used-in-carry-bags/1162362
[11] http://pib.nic.in/newsite/mbErel.aspx?relid=169756
[12] http://goaprintingpress.gov.in/downloads/1415/1415-50-SI-EOG-2.pdf
[13] https://www.downtoearth.org.in/news/goa-bans-plastic-bags-18772
[14] http://pib.nic.in/newsite/mbErel.aspx?relid=169756

S. No.	State	Notification date	Banned Plastics Products	Source
8.	Haryana[15]	Ban since 20.08.2013	Cups, plates, straws, spoons, forks	News
9.	Himachal Pradesh[16]	06.07.2018	Thermocol Cutlery - cups, plates, glasses, spoons or any other item used for serving and consuming food	SPCB, Dept. Environment Science & Technology
10.	Jammu and Kashmir	03.02.2017	Plastic sheets, Cover made of plastic sheets, plastic packaging & multilayered packaging less than 50 microns in thickness	SPCB/ Govt. notification
11.	Jharkhand[17]	18.05.2017	Plastics carry bags below 50 microns	SPCB/ Govt. notification
12.	Karnataka[18]	11.03.2016	Plastic & Thermocol Plates, Spoons, Cups; Non-woven PP Bags, Plastic Flags, Banners & Flex, Plastic Bunting, Plastic Sheets used for spreading on Dining Table, Cling Films	SPCB/ Govt. notification
13.	Kerala[19]	11.10.2018 (w.e.f 01.11.2018)	Plastic and non-woven carry bags, plastic plates, plastic cups, plastic straws, plastic spoons, plastic bottles, plastic pouches, plastic flags, plastic sheet for covering purposes, plastic cling films, Plastic flex and banners, Items made of Thermocol/ Styrofoam/ polypropylene	Government Notification
14.	Madhya Pradesh[20]	24.05.2017	Plastics carry bags below 50 microns	SPCB/ Govt. notification
15.	Maharashtra[21]	23.03. 2018	Straw, plates, spoons, cups, forks, bowl, containers, PET / PETE bottles less than 200 ml, Plastic & Thermocol for decoration purpose.	SPCB/ Govt. notification
16.	Manipur[22]		Plastics carry bags below 50 microns	News
17.	Meghalaya[23]		Plastics carry bags below 50 microns	SPCB/ Govt. notification
18.	Mizoram		No	News

[15] http://hspcb.gov.in/Plastic.pdf
[16] http://desthp.nic.in/notifications/not19032011.pdf
[17] http://forest.jharkhand.gov.in/budgetFile/2075%20eng.pdf
[18] https://www.karnataka.gov.in/empri/PlasticBan/Ban_of_Plastics_Penalty_impose_BBMP.pdf
[19] http://sanitation.kerala.gov.in/wp-content/uploads/2017/08/prohibition-restriction-on-use-of-plastic-carry-bags-27.12.2011.pdf
[20] http://govtpressmp.nic.in/pdf/extra/2017-07-20-361.pdf
[21] http://mpcb.gov.in/images/pdf/plasticwasteGazetteSearch_03072018.pdf
[22] https://www.telegraphindia.com/states/north-east/manipur-to-ban-polythene-bags/cid/1451048
[23] http://megspcb.gov.in/Form/PWM Rules 2016.pdf

S. No.	State	Notification date	Banned Plastics Products	Source
19.	Nagaland[24]	1.1.2004	Plastics carry bags below 50 microns	News
20.	Odisha[25]	29.09.2018 (w.e.f 2nd Oct. 2018)	excluding compostable bags) Plastic dish, spoon, glass, fork, cup, plate, bowl, pouch, PET bottle less than 200 ml, thermocol decorative item.	SPCB/ Govt. notification
21.	Punjab[26]	18.02.2016	Plastic cups, tumblers, spoons, forks & straws, containers (made of virgin and recycled plastic)	SPCB/ Govt. notification
22.	Rajasthan[27]	21.07.2010	Plastics carry bags below 50 microns	SPCB/ Govt. notification
23.	Sikkim[28]	Ban since – 19.05.2016	Plastics made of Styrofoam	News
24.	Tamil Nadu[29]	25.06.2018 (W.E.F 01.01.2019)	Plastic sheets, food wrapping, spreading on dining table, plates, cups, tumbler, water pooches & packets, straw, flag - Term used 'Use & throwaway plastics'	Govt. notification
25.	Telangana[30]		Plastics carry bags below 50 microns	News
26.	Tripura[31]	Ban since – 10.03.2015	Plastics carry bags below 50 microns	News
27.	Uttar Pradesh	22.12.15	Plastic Glasses & cups, Plastic Cover, Plastic Sheet, Plastic Tube, Plastic to pack or cover any type of magazine, books & greetings/invitation card.	Govt. Notification & News
	Uttar Pradesh[32]	15.07.2018	Plastics carry bags below 50 microns Plastics cups, glasses, plates, spoons, tumblers etc. (effective from15th Aug 2018)(ban on Import & export as well)	Govt. Notification

[24] http://www.uniindia.com/nagaland-govt-bans-plastic-from-tomorrow/east/news/1421636.html
[25] http://ospcboard.org/wp-content/uploads /2017/03/52-NoticeforPlasticWaste.pdf
[26] http://www.ppcb.gov.in/Attachments/Plastic Ban Notification/plastic_ban.pdf
[27] http://environment.rajasthan.gov.in/content/dam/environment/Env/Pdf_Files/Notification_21_07_2010.pdf
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[29] http://pib.nic.in/newsite/mbErel.aspx?relid=169756
[30] https://www.thenewsminute.com/article/telangana-govt-bans-plastic-items-all-municipal-bodies-across-state-83019
[31] https://tspcb.tripura.gov.in/Plastic_corrigendum.pdf
[32] http://pib.nic.in/newsite/mbErel.aspx?relid=169756

S. No.	State	Notification date	Banned Plastics Products	Source
28.	Uttarakhand[33]	25.01.2017	Plastics carry bags below 50 microns	Govt. Notification
29.	West Bengal[34]		Plastics carry bags below 50 microns (in religious & historical places)	News

Table 4 - List of Plastic Bans imposed by various Union territories

S. No.	Union Territory	Notification date	Plastic bag	Single use disposable	Other banned material	Source
1.	Andaman and Nicobar Islands					
2.	Chandigarh[35]	16.9.2003	Plastics carry bags (less than 30 microns)			CPCB
3.	Dadra and Nagar Haveli					
4.	Daman and Diu[36]	24.01.2014 (w.e.f 01.03.2014)	Plastics carry bags below 50 microns			SPCB/ Govt. notification
5.	Delhi[37]	23.11.2012	Plastic Cover, Plastic Sheet, Plastic Tube, Plastic to pack or cover any type of magazine, books & greetings/invitation card.			SPCB/ Govt. notification
6.	Lakshadweep					
7.	Puducherry (Pondicherry)		Plastics carry bags below 50 microns			News

[33] http://pib.nic.in/newsite/mbErel.aspx?relid=169756
[34] http://www.wbpcb.gov.in/writereaddata/upload/downloads/Download-57.pdf
[35] http://chandigarhenvis.gov.in/beta/htm/BanonPolythene2Oct.htm
[36] http://pccdaman.info/pdf/Plastic_Bags_Ban_Notification.pdf
[37] http://www.delhi.gov.in/wps/wcm/connect/d1c5b7004f027fd58b34afb60aeecb21/Notification_PlasticBags.pdf?MOD=AJPERES&lmod=-332103428&CACHEID=d1c5b7004f027fd58b34afb60aeecb21

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)
PART II—Section 3—Sub-section (i)

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 12 अगस्त, 2021

सा.का.नि. 571(अ).—प्लास्टिक अपशिष्ट प्रबंधन नियम, 2016 को संशोधन करने के लिए भारत के राजपत्र, असाधारण में अधिसूचना संख्या सा.का.नि. 169 (अ) द्वारा तारीख 11 मार्च, 2021 में प्रारूप नियम प्रकाशित किए गए थे, जिसमें उन सभी लोगों से, जो उन नियमों से प्रभावित हो सकते हैं, उक्त प्रारूप नियम को अंतर्विष्ट करने वाले राजपत्र की प्रतियां जनता को उपलब्ध कराए जाने की तारीख से साठ दिन की अवधि के भीतर आक्षेप और सुझाव आमंत्रित किए गए थे;

और, उक्त प्रारूप नियमों को अंतर्विष्ठ करने वाले राजपत्र की प्रतियां जनता को तारीख 11 मार्च, 2021 को उपलब्ध कराई गई थी;

और, उपर्युक्त अवधि के भीतर प्राप्त आक्षेपों और सुझावों पर केंद्रीय सरकार द्वारा सम्यक रूप से विचार किया गया है;

अत:, अब केन्द्रीय सरकार पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 6, धारा 8 और धारा 25 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, एतद्वारा प्लास्टिक अपशिष्ट प्रबंधन नियम, 2016 में संशोधन करने के लिए निम्नलिखित नियम बनाती है, अर्थात्:-

1. (1) इन नियमों का संक्षिप्त नाम प्लास्टिक अपशिष्ट प्रबंधन (संशोधन) नियम, 2021 कहा है।

(2) वे राजपत्र में उनके प्रकाशन की तारीख को प्रवृत्त होंगे।

2. प्लास्टिक अपशिष्ट प्रबंधन नियम, 2016 (इसमें इसके पश्चात् उक्त नियमों को कहा गया है) में, नियम 2 में, उप-नियम (1) में, ''आयातकों'' शब्द के पश्चात् ''ब्राण्ड स्वामी, प्लास्टिक अपशिष्ट प्रसंस्करणकर्ता (पुनर्चक्रक, सह-प्रसंस्करणकर्ता आदि)'' शब्द अंत:स्थापित किया जाएगा।

उक्त नियमों में, नियम 3 में –

(i) खंड (ढ) के पश्चात, निम्नलिखित खंड अंत:स्थापित किया जाएगा, अर्थात् -

'(ढ क) "बिना बुने प्लास्टिक बैग" – से अभिप्रेत है जो यांत्रिक अथवा थर्मल अथवा रासायनिक साधनों द्वारा एक-साथ बंधे हुए जटिल प्लास्टिक फाइबरों या तंतुओं (और छिद्रित फिल्मों द्वारा) की प्लास्टिक की शीट अथवा वेब आकार के कपड़े से बने हुए बिना बुने प्लास्टिक के बैग और "बिना बुने कपड़े" से अभिप्रेत है जिसमें एक समतल अथवा गुच्छेदार छिद्रयुक्त शीट जो सीधे प्लास्टिक फाइबरों, पिघले हुए प्लास्टिक अथवा प्लास्टिक की फिल्मों से बनाया जाता है;

(ii) खंड (थ) के पश्चात, निम्नलिखित खंड अंत:स्थापित किया जाएगा, अर्थात् -

'(थ क) "प्लास्टिक अपशिष्ट प्रसंस्करण" – से अभिप्रेत है जिससे कोई ऐसी प्रक्रिया जिसके द्वारा प्लास्टिक अपशिष्ट को पुन:उपयोग, पुनर्चक्रण, सह-प्रसंस्करण अथवा नए उत्पादों में परिवर्तन के प्रयोजन के लिए प्रबंधित किया जाता है; ';

(iii) खंड (फ) के पश्चात, निम्नलिखित खंड अंत:स्थापित किया जाएगा, अर्थात् -

'(फ क) "एकल प्रयोग प्लास्टिक से बनी वस्तु" का अर्थ है – जिससे प्लास्टिक की मद, जिसके निपटान अथवा पुनर्चक्रण से पहले उसे एक ही प्रयोजन के लिए एक बार ही उपयोग किया जाना है;

(फ ख) "थर्मोसेट प्लास्टिक" से अभिप्रेत है जिसमें ऐसा प्लास्टिक जो गर्म करने पर अपरिवर्तनीय रूप से कठोर हो जाता है और इसलिए इसे वांछित आकार में नहीं बदला जा सकता है;

(फ ग) "थर्मोप्लास्टिक" से अभिप्रेत है जिसमें ऐसा प्लास्टिक जो गर्म करने पर नरम हो जाता है और इसे वांछित आकार में ढाला जा सकता है;'

4. उक्त नियमों में, नियम 4 में –

(क) उप-नियम (1) में, - (i) "आयातक भंडारण" शब्दों के स्थान पर "आयात, भंडारण" शब्द रखें जाएंगे;

(ii) खंड (ग) में, "पचास माइक्रोन की मोटाई", शब्दों के स्थान पर, शब्द आंकड़े, अक्षर और कोष्ठक "30 सितम्बर 2021 से पचहत्तर माइक्रोन की मोटाई और 31 दिसम्बर, 2022 से एक सौ बीस (120) माइक्रोन की मोटाई" शब्द रखे जाएंगे;

(iii) खंड (ज), "कैरी बैगों", शब्दों के बाद, "और वस्तु" शब्द अंतर्विष्ट किए जाएंगे;

(iv) खंड (ज), "कंपोस्ट योग्य प्लास्टिक कैरी बैगों", शब्दों के बाद, "या वस्तु या दोनों" शब्द अंतर्विष्ट किए जाएंगे;

(v) खंड (झ) के पश्चात, निम्नलिखित खंड अंत:स्थापित किया जाएगा, अर्थात् -

"(ञ) 30 सितम्बर, 2021 की तारीख से गैर-बुना हुआ प्लास्टिक कैरी बैग 60 ग्राम प्रति वर्ग मीटर (जीएसएम) से कम नहीं होगा।";

(ख) उप-नियम (1) के पश्चात, निम्नलिखित उप-नियम अंत:स्थापित किया जाएगा, अर्थात् -

"(2)" 1 जुलाई, 2022 की तारीख से पोलीस्टाइरीन और विस्तारित पोलीस्टाइरीन वस्तुओं सहित निम्नलिखित एकल-प्रयोग-प्लास्टिक वस्तुओं के विनिर्माण, आयात, भंडारण, वितरण, बिक्री और उपयोग का निषेध किया जाएगा:-

(क) प्लास्टिक स्टिक युक्त ईयर बड्स, गुब्बारों के लिए प्लास्टिक की डंडिया, प्लास्टिक के झंडे, कैंडी स्टिक, आइसक्रीम की डंडिया, पोलीस्टाइरीन (थर्मोकोल) की सजावटी सामग्री;

(ख) प्लेटें, कप, गिलास, कांटे, चम्मच, चाकू, स्ट्रॉ, ट्रे जैसे कटलरी, मिठाई के डिब्बों के इर्द-गिर्द लपेटने या पैक करने वाली फिल्में, निमंत्रण कार्ड और सिगरेट पैकेट, 100 माइक्रोन से कम मोटाई वाले प्लास्टिक या पीवीसी बैनर, स्ट्रिर।

(3) उप-नियम (2) (ख) के उपाबंध, कंपोस्ट योग्य प्लास्टिक से बनी हुई वस्तुओं पर लागू नहीं होंगे।

(4) इस अधिसूचना के बाद कैरी बैग, प्लास्टिक शीट या समान प्रकार की सामग्री या प्लास्टिक शीट और बहु-परतीय पैकेजिंग से बने कवर और पोलिस्टाइरीन और विस्तारित पोलिस्टाइरीन, वस्तुओं सहित एकल प्रयोग के प्लास्टिक के विनिर्माण, आयात, भण्डारण, वितरण, विक्रय और उपयोग को निषिद्ध करने के संबंध में, जारी की गई कोई भी अधिसूचना, इस अधिसूचना के प्रकाशन की तारीख से दस वर्ष की अवधि समाप्त होने के पश्चात लागू होगी।

5. उक्त नियमों में, नियम 5 में, उप-नियम (1) में, खण्ड (घ) में "2000" अंकों के स्थान पर "2016" रखा जाएगा।

6. उक्त नियमों, में, नियम 6 में, उप-नियम (2) में, खण्ड (क) के पश्चात निम्नलिखित खण्ड अंत-स्थापित किया जाएगा, अर्थात्:-

"(क क) सुनिश्चित करना कि इन यथा संशोधित नियमों के उपबंधों का अनुपालन किया जाए।

7. उक्त नियमों में नियम 7 में, उप-नियम (1) में, खण्ड (क) के पश्चात निम्नलिखित खण्ड अंत:स्थापित किया जाएगा, अर्थात्:-

"(क क) सुनिश्चित करना कि इन यथा संशोधित नियमों के उपबंधों का अनुपालन किया जाए।

8. उक्त नियमों में, नियम 9 में, उप-नियम (1) में, "संबंधित स्थानीय निकाय" शब्दों के पश्चात, "इन नियमों के अंतर्गत समय-समय पर जारी किए गए दिशानिर्देशों के अनुसार" शब्द अंत:स्थापित किए जाएंगे।

9. नियम 11 में, उप-नियम (1), -

(i) "प्लास्टिक कैरी बैग" शब्दों के पश्चात, "प्लास्टिक पैकिंग" शब्द अंत:स्थापित किए जाएंगे;

(ii) खंड (क) में "विनिर्माता" शब्द के पश्चात, "उत्पादक" या ब्रैंड स्वामी" शब्द जोड़े जाएंगे, और "कैरी बैग" शब्द के बाद, "और ब्रैंड के स्वामी द्वारा उपयोग प्लास्टिक पैकिंग" शब्द अंत:स्थापित किए जाएंगे;

(iii) खंड (ख), "बहु-परतीय पैकिंग" शब्दों के पश्चात, "आयातित सामग्री के लिए उपयोग बहु-परतीय पैकिंग को छोडकर" अंत:स्थापित किया जाएगा।

(iv) खंड (ग) में, "नाम और प्रमाणपत्र सं." शब्दों के पश्चात, "उत्पादक का" अंत:स्थापित किया जाएगा।

10. नियम 12 में, -

(i) उप-नियम (2) में, "अपशिष्ट जनक" शब्दों के पश्चात, "पर प्रतिबंध या निषेध" शब्द अंत:स्थापित किए जाएंगे;

(ii) उप-नियम (3) में, "अपशिष्ट जनक" शब्दों के पश्चात, "पर प्रतिबंध या निषेध" शब्द अंत:स्थापित किए जाएंगे।

11. नियम 13, में उप-नियम (1) में, "संबंधित संघ राज्यक्षेत्र" शब्दों के पश्चात, "या केंद्रीय प्रदूषण नियंत्रण बोर्ड" अंत:स्थापित किया जाएगा।

[फा. सं. 17-2/2001(पार्ट)पार्ट I-एचएसएमडी]

नरेश पाल गंगवार, संयुक्त सचिव

टिप्पण: मूल नियम, भारत के राजपत्र, असाधारण, भाग-II, खंड 3, उपखंड (i) में सा.का.नि. 320(अ) तारीख 18 मार्च, 2016 द्वारा प्रकाशित किए गए थे और तत्पश्चात इनमें अधिसूचना संख्या सा.का.नि. 285(अ) तारीख 27 मार्च, 2018 के द्वारा संशोधन किया गया था।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 12th August, 2021

G.S.R. 571(E).—Whereas the draft rules to amend the Plastics Waste Management Rules, 2016, were published in the Gazette of India, Extraordinary, dated the 11th March, 2021 vide notification number GSR 169 (E), inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days from the date copies of the Gazette containing the said draft rules were made available to the public;

And whereas, copies of the Gazette containing the said draft rules were made available to the public on the 11th March, 2021;

And whereas, objections and suggestions received within the aforesaid period have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sections 6, 8 and 25 of Environment (Protection) Act 1986, (29 of 1986), the Central Government hereby makes the following rules to amend the Plastic Waste Management Rules, 2016, namely :-

1. (1) These rules may be called Plastic Waste Management (Amendment) Rules, 2021.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Plastic Waste Management Rules,2016 (hereinafter referred to as the said rules), in rule 2, in sub-rule (1), after the word "Importers", the words, "brand-owner, plastic waste processor (recycler, co-processor, etc.)" shall be inserted.

3. In the said rules, in rule 3,

(i) after clause (n), the following clause shall be inserted, namely :-

'(na) "Non-woven plastic bag" means Non-woven plastic bag made up of plastic sheet or web structured fabric of entangled plastic fibers or filaments (and by perforating films) bonded together by mechanical or thermal or chemical means, and the "non-woven fabric" means a flat or tufted porous sheet that is made directly from plastic fibres, molten plastic or plastic films;'

(ii) after clause (q), the following clause shall be inserted, namely: -

'(qa) "Plastic waste processing" means any process by which plastic waste is handled for the purpose of reuse, recycling, co-processing or transformation into new products;'

(iii) after clause (v), the following clauses shall be inserted, namely: -

'(va) "Single-use plastic commodity" mean a plastic item intended to be used once for the same purpose before being disposed of or recycled;'

'(vb) "Thermoset plastic" means a plastic which becomes irreversibly rigid when heated and hence cannot be remoulded into desired shape;'

'(vc) "Thermoplastic" means a plastic which softens on heating and can be moulded into desired shape;'.

4. In the said rules, in rule 4, -

(a) in sub-rule (1),−

(i) for the words "importer stocking", the words "import, stocking" shall be substituted;

(ii) in clause (c), for the words "fifty microns in thickness" , the words, figures, letters and brackets "seventy five microns in thickness with effect from the 30th September, 2021and one hundred and twenty (120) microns in thickness with effect from the 31st December, 2022" shall be substituted;

(iii) in clause (h), after the words, "carry bags", the words "and commodities" shall be inserted;

(iv) in clause (h), after the words, "compostable plastic carry bags", the words "or commodities or both" shall be inserted;

(v) after clause (i), following clause shall be inserted, namely: -

" (j) non-woven plastic carry bag shall not be less than 60 Gram Per Square Meter (GSM) with effect from the 30th September, 2021.";

(b) after sub-rule (1), the following sub-ules shall be inserted, namely:-

"(2) The manufacture, import, stocking, distribution, sale and use of following single-use plastic, including polystyrene and expanded polystyrene, commodities shall be prohibited with effect from the 1st July, 2022:-

(a) ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol] for decoration;

(b) plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.

(3) The provisions of sub-rule (2) (b) shall not apply to commodities made of compostable plastic.

(4) Any notification prohibiting the manufacture, import, stocking, distribution, sale and use of carry bags, plastic sheets or like, or cover made of plastic sheets and multi-layered packaging and single-use plastic, including polystyrene and expanded polystyrene, commodities, issued after this notification, shall come into force after the expiry of ten years, from the date of its publication".

5. In the said rules, in rule 5, in sub-rule (1), in clause (d), for the figures "2000", the figures "2016" shall be substituted.

6. In the said rules, in rule 6, in sub-rule (2), after clause (a), following clause shall be inserted, namely: -

"(aa) ensuring that the provisions of these rules, as amended, are adhered to;".

7. In the said rules, in rule 7, in sub-rule (1), after clause (a), following clause shall be inserted, namely : -

"(aa) ensuring that the provisions of these rules, as amended, are adhered to;".

8. In the said rules, in rule 9, in sub-rule (1), after the words, "local body concerned", the words "as per guidelines issued under these rules from time to time" shall be inserted.

9. In rule 11, sub-rule (1), −

(i) after the words "plastic carry bag", the words, "plastic packaging" shall be inserted;

(ii) in clause (a), after the word "manufacturer", the words "producer or brand-owner" shall be inserted, and after the words "carry bag", the words "and plastic packaging used by the brand owner" shall be inserted;

(iii) in clause (b), after the words "multilayered packaging", the words "excluding multi-layered packaging used for imported goods" shall be inserted;

(iv) in clause (c), after the words "name and certificate number", the words "of producer" shall be inserted.

10. In rule 12, −

(i) in sub-rule (2), after the words "waste generator," ,the words "restriction or prohibition on" shall be inserted;

(ii) in sub-rule (3), after the words "waste generator," ,the words "

restriction or prohibition on" shall be inserted.

11. In rule 13, in sub-rule (1), after the words "Union Territory concerned", the words "or the Central Pollution Control Board" shall be inserted.

[F. No. 17-2-2001 (Pt)-Part I -HSMD]

NARESH PAL GANGAWAR, Jt. Secy.

Note : The principal rules were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i), *vide* number GSR 320 (E), dated the 18th March, 2016 and subsequently amended vide notification number GSR 285 (E), dated the 27th March, 2018.

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