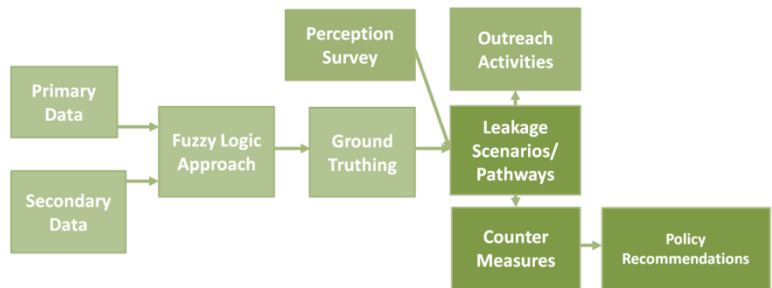
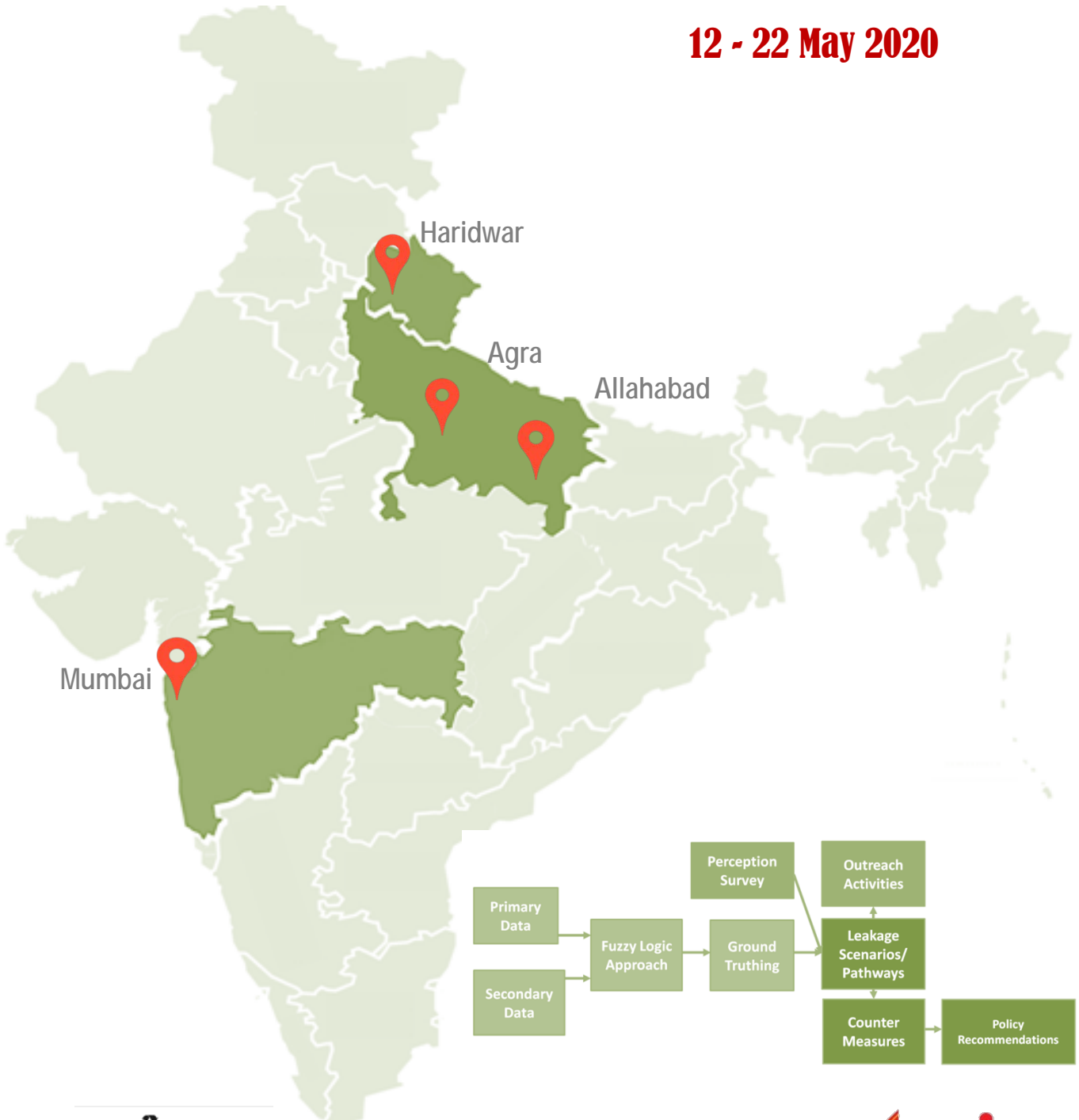


## OUTCOME REPORT OF

# National Policy Workshop Webinar Series on “Countermeasures for Riverine and Marine Plastic Litter in India”

**12 - 22 May 2020**



## ACKNOWLEDGEMENT

The project on Countermeasures for riverine & marine plastic litter as undertaken in four cities (Haridwar, Agra, Prayagraj and Mumbai) facilitated & sponsored by UNEP, has been concluded with the organization of National Policy Workshop via six webinars organized during 12-22 May, 2020 as facilitated & sponsored by UNDP.

This outcome report is a collation of insights on the project theme, with compilation of proceedings & presentations that have been made by a galaxy of expert speakers & panelists and includes the recommendations that are made through the presentations along with those of policy dialogue & industry advice through the enthusiastic participation of various stakeholders.

NPC accordingly acknowledges the kind support & guidance of UNEP & UNDP and for the partnering by Chintan, Development Alternatives & TERI who engaged in the outreach process & perception surveys. We are grateful to all the esteemed speakers & panelists from various organizations and Ministries & Research Institutions.

We further wish to thank all the panelists of the policy dialogue session who have set directionality for future initiatives that may be undertaken in the Plastics domain & sector. We express our gratitude to the Chemical & Petrochemicals Manufacturing Association for sharing key recommendations as well for consideration into policy making.

We thank Shri S.P. Chandak for the inspired moderation of the webinars in association with the Coordinators of NPC & acknowledge the significant work by the Environment Group of NPC, and its team and the office of the Regional Directorate, Delhi for the successful organization of the well received and appreciated webinar series. We thank all attendees/ participants to the webinars who enthusiastically engaged in Q & A's and deliberations & encouraged deep & meaningful discussion to enable a fresh momentum to arise to address the beneficial aspects & challenges of plastics in the Economy.

We would like to thank our DG, NPC Shri A.K. Jha, IES for the guidance, support & inspiration in undertaking the national policy workshop via webinar series and to the IT team of NPC for facilitating the IT platform & infrastructure.

NPC Team

## NPC TEAM

Mr. K.D. Bhardwaj	<i>Regional Director, Delhi</i>
Dr. Shukla Pal Maitra	<i>Director</i>
Dr. Harsh Thukral	<i>Deputy Director</i>
Mr. Oinam Samuel	<i>Deputy Director</i>
Ms. Nikita Roy	<i>Assistant Director</i>
Mr. Vijay Kumar Nehra	<i>Assistant Director</i>
Mr. S.K. Jain	<i>Lab, Analyst</i>
Mr. Himendra Singh	<i>Project Associate</i>
Mr. Hemant Kumar	<i>Project Associate</i>
Ms. Pooja Saroj	<i>Project Associate</i>
Mr. Jayant Kamde	<i>Project Associate</i>



### NATIONAL PRODUCTIVITY COUNCIL

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Ministry of Commerce & Industry, Govt. of India  
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## **EXECUTIVE SUMMARY**

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## Executive Summary

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UN Environment Programme Regional Office of Asia and the Pacific (UNEP-ROAP) with the support from India Country Office helps to implement its global programmes in the region by initiating, coordinating and catalyzing regional and sub-regional cooperation and action in response to environmental problems. On 4<sup>th</sup> March 2019 the Government of Japan and UN Environment Programme announced that they will join hands in effort to boost information and know-how to develop countermeasures against marine plastic litter in Southeast Asia and in India. The new initiative, Promotion of countermeasures against marine plastic litter in Southeast Asia and India, was created to develop a model for plastic leakage besides monitoring and determining leakage hotspots along the Mekong and the Ganges. Additionally, in India, provincial and local governments in Mumbai, Agra, and selected cities along the Ganges received support to create awareness and engage communities to check plastic pollution and for sustained clean-up campaigns.

The overall goal of the project has been “To lead benchmarking and standards-setting effort to combat marine litter and plastic pollution and engage communities to prevent pollution in certain hotspots”. The project aimed to identify a region-based model for monitoring and assessment of plastic leakage and pollution reduction. The project developed a comprehensive methodology for future studies, and reached out to a wide spectrum of stakeholders to enhance action and would continue to disseminate the project findings and work towards developing future strategies.

To showcase important achievements of the Counter MEASURE project (*“Promotion of countermeasures against marine plastic litter in Southeast Asia and India”*) as undertaken in its first phase, a National Policy Workshop has been organised via Webinar Series on “Countermeasures for Riverine and Marine Plastic Litter in India” as

organized through *Webex* platform during 12 – 22 May 2020. The workshop highlighted project’s technical accomplishments, innovative solutions and key findings, as well as outreach and perception survey insights and stories towards nudging behaviour change in the context of plastics consumption, disposal and recycling etc and community initiatives for plastic waste management, with an overall goal of developing a national road map and strategy on plastic pollution and marine litter. In addition to the focus on plastics waste management theme a special session was also organised to address impact of COVID-19 on Plastic Waste Generation (used PPEs and Wastes from HCFs) and Upcoming Challenges as Webinar 5.

The overall schedule of the webinar series is given below. In addition, for each webinar’s theme respective agenda with sub topics and presentations are provided in the report.

<b>WEBINAR</b>	<b>THEME/TOPIC</b>	<b>DATE</b>
1	The Science, Technology of Plastics & Techniques/Best Practices of Plastics Pollution Assessment and Investigation	12 <sup>th</sup> May
2	Community Perceptions and Behavioural Aspects for Plastic Management and Promotion of Countermeasures to address (Riverine and Marine) Plastic Litter	14 <sup>th</sup> May
3	Activities and Best Practices to Counter Plastics Litter by Sustainable Waste Management and Circularity	16 <sup>th</sup> May
4	Assessment of Plastic Pollution Impact on Natural Capital and Riverine and Marine Ecosystems needing Policy Intervention	18 <sup>th</sup> May
5	Impact of COVID-19 on Plastic Waste Generation (used PPEs and Wastes from HCFs) and Upcoming Challenges	20 <sup>th</sup> May
6	Scenarios to Counter Plastics Litter by Overcoming Barriers and Identifying Enabling Measures	22 <sup>nd</sup> May
	POLICY DIALOGUE	

The webinar was attended by 3852 participants as located across 18 countries such as Denmark, Egypt, Ethiopia, Germany, India, Ireland, Malaysia, Netherlands, Norway, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Taiwan, Thailand, United Arab Emirates, United Kingdom, United States of America etc. The participants were from across

various sectors (public / private organizations, civil society, academia, embassy, and from across a range of national and multilateral institutions such as UN Organisations, GIZ, WWF, ZSL, World Bank, JICA, SACEP etc). The Webinar has been highly appreciated by participants and attracted attention from a wide range of stakeholders and is being referred to as a milestone in Indian efforts to address the various issues concerning plastics.

This workshop outcome document comprises Concept Notes, Flyers, Agendas, Proceedings, Press Releases and Presentations (PPTs) of each webinar which serves as a valuable source of information and literature for a spectrum of stakeholders as available on the website of NPC ([www.npcindia.gov.in](http://www.npcindia.gov.in)).

In addition, the output of ‘Policy Dialogue’ in the form of structured recommendations for consideration of various ministries and policy makers towards strengthening management of plastic across the economy and future initiatives to undertake emerged as placed in the report. Further, the recommendations from Industry, especially from the Chemical and Petrochemicals Manufacturing Association as received, to draw attention towards future research and project initiatives along with suggestions on a collective approach to circular economy of plastics has been appended for consideration of policy makers towards evolving and enabling suitable range of policy interventions.



## PRESS RELEASE

10 MAY 2020

National Productivity Council (NPC) under DPIIT, Ministry of Commerce and Industry of India organization has been engaged in identifying a region-based model for monitoring and assessment of plastic leakage and pollution reduction targeting land-based plastic leakage entering waterways such as rivers and canals or drainages to the sea, one-of-a-kind study by NPC identified about 50 categories of product based plastic litter at hotspots near rivers Ganga and Yamuna and about 40 types of polymer-based microplastics in these rivers.

In order to disseminate findings, NPC is organizing the National Policy Workshop through a series of the webinar during 12-22 May 2020 comprising of six on-line sessions. This workshop is part of the UNEP lead project "Promotion of countermeasures against marine plastic litter in Southeast Asia and India" funded by the Govt. of Japan. This project targets to identify the countermeasures, which would be utilized as inputs for developing national roadmap and strategy to prevent plastic pollution in the river and Marine Eco-System in India.

The workshop comprises of sessions on science and technology of plastic pollution assessment, community perception and behavioural aspects, plastic waste management through circularity concept, plastic pollution impact on riverine and marine ecosystem, scenario to counter plastic litter. A specific session on plastic waste generation during COVID 19 spread in India has also been organized. This workshop is open to all interested stakeholders who can register at <https://www.npcindia.gov.in/NPC/User/unep>

To conclude and deliberate the project and workshop outcomes, and potential policy measures & strategy to counter plastic pollution in the river and marine ecosystem, a session for high ranking policymakers has been planned from 4.00 to 5.00 pm on 22nd May 2020. This session will be chaired by the Secretary, Ministry of Environment, Forest and Climate Change, and will also be participated by senior officials from UNEP and relevant Ministries & Departments.

National Productivity Council  
5-6 Institutional Area, Lodi Road,  
New Delhi 110003  
Ph: 24607313



# **WEBINAR 1**

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**THE SCIENCE, TECHNOLOGY OF PLASTICS & TECHNIQUES/BEST  
PRACTICES OF PLASTICS POLLUTION ASSESSMENT AND INVESTIGATION**





## Concept Note

### WEBINAR 1

Date: 12<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Theme:

The Science & Technology of Plastics & Techniques/best practices of plastics pollution assessment and investigation.

#### Background:

In the plastic age we are in, if plastics are not reorganized and redesigned to be maintained in a circular loop or properly managed at their end-of-life, they will find their way into the environment, a phenomenon called leakage. To increase plastic material circularity, leakage of plastic from the human technosphere must be reduced, and ultimately prevented. To effectively control the plastic waste litter, stakeholders must be able to identify and detect the leaks at different points in the plastic value chain and initiate appropriate control measures. Plastics enter the environment by one of two core streams: visible macroplastics mainly from mismanaged waste, and a significant quantum as invisible primary microplastics. Currently there is a need to standardise methodology to perform plastic leakage assessments.

#### Objective:

The session shall highlight the science and technology features of polymers and plastics and the growing consumption aspects and generation of plastic waste including from single use plastics. Further, the initiatives in plastic waste assessment undertaken by various institutions / researchers is deliberated to reflect on the concerns of land based hotspots and problem of riverine and marine litter. The session shares insights from clean up initiatives in four cities as part of UNEP project. Further, the discussions seek to explore and identify gaps in plastic waste assessment that could be taken up for new projects.

#### The session shall cover the following topics:

- Assessment of Plastic Pollution by NPC in 4 cities.
- Polymer Science & Technology for plastics products.
- Environmental Implication of Single Use Plastic.
- Methodology for Macro-plastic assessment undertaken in India and challenges.
- Methodology for Micro-plastic assessments in rivers & Oceans and constraints.
- Approach of sampling & analysis in sediments of river Ganga.
- Problem of Marine Litter and Initiatives undertaken by Government of India in the area of plastic pollution assessments.

#### Expected Outcome:

Recommendations for Plastic waste assessment methodology and need for standardization and compilation of best practices followed in India.





## AGENDA Webinar 1

### The Science, Technology of Plastics & Techniques/Best Practices of Plastics Pollution Assessment and Investigation

12 May 2020 | 14:30 – 17:00 hrs

**Moderator:** Mr. SP Chandak, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH

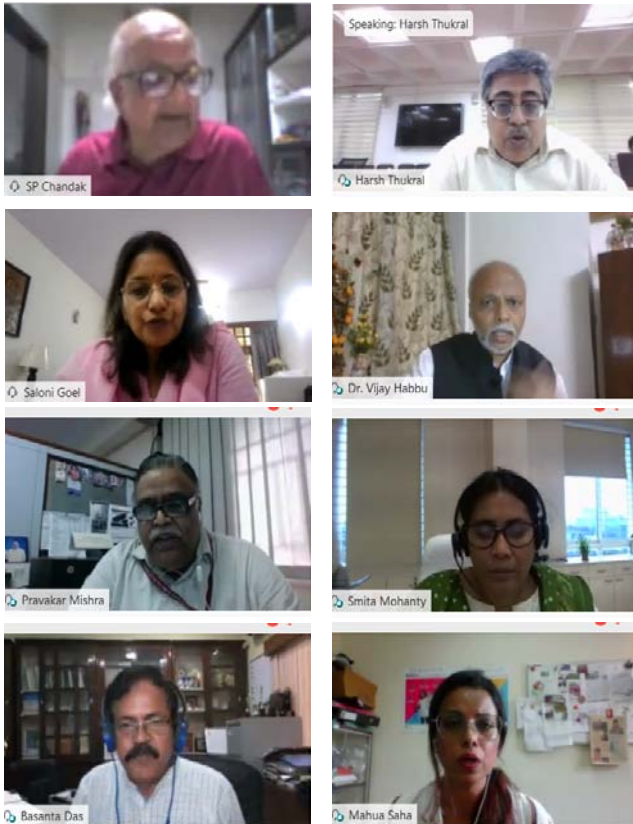
**Coordinator:** Dr. Harsh Thukral, Deputy Director, NPC

Time (hrs)	Theme/Topic	Speaker
14:30 – 14:40	Introduction of the Counter Measure Project	Ms. Saloni Goel, UNEP
14:40- 15:00	Understanding Plastics for their utility and environmentally safe handling”	Dr. Vijay G. Habbu, Adjunct Professor, Institute of Chemical Technology (ICT)
15:00 – 15:15	Problem of Marine Litter and Initiatives by MoES regarding Plastic Pollution Assessment	Dr. Pravakar Mishra, Scientist ‘F’, NCCR, MoES
15:15 – 15:30	Plastics Consumption and Disposal-Methodology for Waste Plastics Assessment in India	Dr. Smita Mohanty, Director, CIPET
15:30 – 15:45	Methodology for Micro-plastic Assessments in Rivers & Oceans	Dr. Mahua Saha, NIO
15:45 – 16:00	Approach of Sampling & Analysis in Sediments of River Ganga	Dr. Basanta Kumar Das, Director, CIFRI
16:00 – 16:15	Methodology for Macro-plastic Assessments in four Cities, India	Dr. Harsh Thukral, Deputy Director, NPC
16:15 – 17:00	Panel Discussion: Recommendations for Plastic Waste Assessment Methodology and need for standardization and compilation of best practices followed in India.  Questions and Answers	Additional Panel Members: Ms. Saloni Goel, UNEP Dr. D.D. Kale, Former Prof. UDCT Mr. K.D. Bhardwaj, RD, NPC, Delhi; Mr. Amit Jain, IRG System South Asia Dr. Shuklupal Maitra, Director, NPC



# Proceedings National Policy Workshop through Webinar on Riverine and Marine Plastic Litter in India

**12<sup>th</sup> May, 2020 | 14:30 – 17:30 hrs**



## WEBINAR 1

**The Science, Technology of Plastics &  
Techniques/Best Practices of Plastics Pollution  
Assessment and Investigation**

**National Policy Workshop (Virtual)**  
on  
**Countermeasures for Riverine and Marine Plastic Litter in India**  
12-22 May 2020

**Webinar Session 1**  
**Science & Technology of Plastics and Techniques / best practices of plastics pollution assessment and investigation**  
Date: 12th May 2020 | 14:30 – 17:00 hrs

**Session Coverage**

- Understanding Plastics for their utility and environmentally safe handling
- Problem of Marine Litter and Initiatives regarding Plastics Pollution Assessment
- Plastics Consumption and Disposal-Methodology for Waste Plastics Assessment
- Methodology for Micro-plastic Assessments in Rivers & Oceans
- Approach of Sampling & Analysis in Sediments of River Ganga
- Methodology for Macro-plastic Assessments in four Cities, India

**Potential Resource Speakers**

- Dr. Vijay G. Habbu, Institute of Chemical Technology
- Dr. Pravaakar Mishra, National Centre for Coastal Research.
- Dr. Smita Mohanty, CIPET
- Dr. Mahua Saha, National Institute of Oceanography
- Dr. Basanta Kumar Das, Central Inland Fisheries Research Institute
- Ms. Saloni Goel, UNEP
- Dr. Harsh Thukral, NPC

**Registration Link**  
<https://npcindia.gov.in/NPC/User/unep>

**Partner Agencies**

Development Alternatives  
chintan environmental research and action group  
teri

## WEBINAR 1

### Proceeding

## The Science and Technology of Plastics & Techniques/Best Practices of Plastics Pollution Assessment and Investigation

12 May 2020 | 14:30 - 17:30 hrs

#### Moderator

**Mr. SP Chandak,**

*Former Deputy Director, UNEP & Professor Emeritus, BIMTECH*

#### Coordinator

**Dr. Harsh Thukral,**

*Deputy Director, NPC*

### INTRODUCTION

In the plastic age we are in, if plastics are not reorganized and redesigned to be maintained in a circular loop or properly managed at their end-of-life, they will find their way into the environment, a phenomenon called leakage. To increase plastic material circularity, leakage of plastic from the human technosphere must be reduced, and ultimately prevented. To effectively control the plastic waste litter, stakeholders must be able to identify and detect the leaks at different points in the plastic value chain and initiate appropriate control measures. Plastics enter the environment by one of two core streams: visible macro-plastics mainly from mismanaged waste, and a significant quantum as invisible primary micro-plastics. Currently there is a need to standardise methodology to perform plastic leakage assessments.

### SESSION HIGHLIGHTS

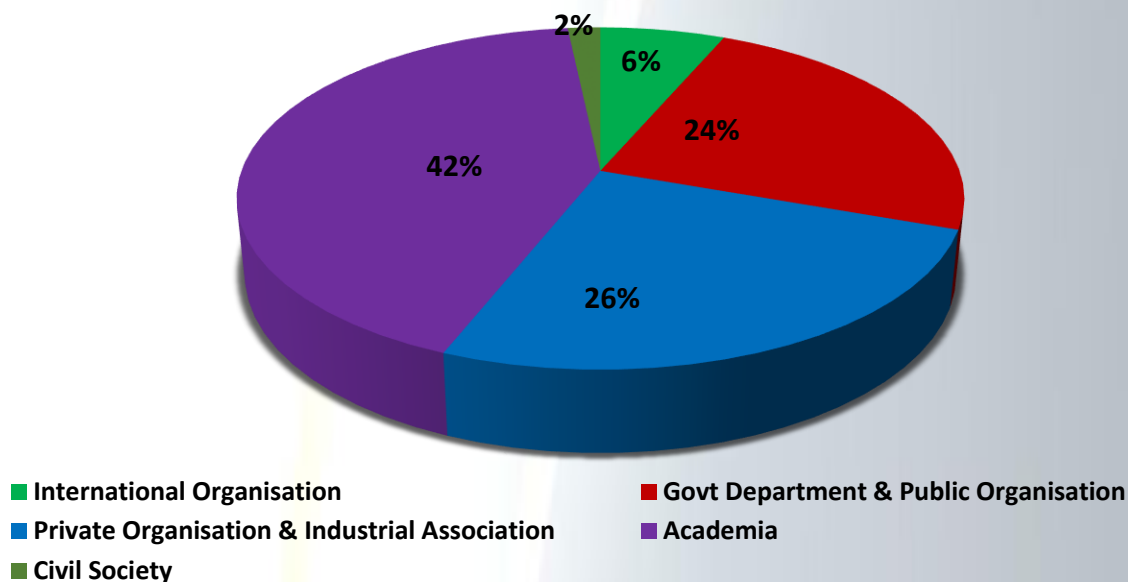
The session highlighted the science and technology features of polymers and plastics and the growing consumption aspects and generation of plastic waste including from single use plastics. Further, the initiatives in plastic waste assessment, including macroplastics and microplastics as undertaken by various institutions such as Ministry of Earth Science, National Institute of Oceanography, CIPET and the researchers was deliberated to reflect on the concerns of land based hotspots and problem of riverine and marine litter and their impacts as well as on methodologies adopted for the analyses undertaken. The session further highlighted insights from clean up initiatives in four cities as part of UNEP project. Further, the discussions led to exploring and identify gaps in plastic waste assessment (including plastics in airborne dust, tap water / RO water studies etc) that could be taken up for new projects.

### WEBINAR 1 AGENDA

Time (hrs)	Theme/Topic	Speaker
14:30 - 14:40	Introduction of the Counter Measure Project	Ms. Saloni Goel, UNEP

Time (hrs)	Theme/Topic	Speaker
14:40- 15:00	Understanding Plastics for their utility and environmentally safe handling”	Dr. Vijay G. Habbu, Adjunct Professor, Institute of Chemical Technology (ICT)
15:00 – 15:15	Problem of Marine Litter and Initiatives by MoES regarding Plastic Pollution Assessment	Dr. Pravakar Mishra, Scientist ‘F’, NCCR, MoES
15:15 – 15:30	Plastics Consumption and Disposal-Methodology for Waste Plastics Assessment in India	Dr. Smita Mohanty, Director, CIPET
15:30 – 15:45	Methodology for Micro-plastic Assessments in Rivers & Oceans	Dr. Mahua Saha, NIO
15:45 – 16:00	Approach of Sampling & Analysis in Sediments of River Ganga	Dr. Basanta Kumar Das Director, CIFRI
16:00 – 16:15	Methodology for Macro-plastic Assessments in four Cities, India	Dr. Harsh Thukral, Deputy Director, NPC
16:15 – 17:00	Panel Discussion: Recommendations for Plastic Waste Assessment Methodology and need for standardization and compilation of best practices followed in India.  Questions and Answers	Additional Panel Members: Ms. Saloni Goel, UNEP Dr. D.D. Kale, Former Prof. UDCT Mr. K.D. Bhardwaj, NPC Mr. Amit Jain, IRG System South Asia Dr. Shuklupal Maitra, NPC

The webinar was attended by 700 plus participants as located across 12 countries. The participants were from across various sectors (public / private organizations, civil society, academia, and from across a range of national and multilateral institutions such as UN Organisations and the World Bank). The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders. The participant profile details are depicted in **Figure 1**.



**Figure 1: Participant Profile**



## WEBINAR PROCEEDINGS

The session was opened by the coordinator Dr. Harsh Thukral, Deputy Director, NPC, who welcomed the Moderator, all the resource speakers, panelists and attendees / participants on behalf of NPC and introduced the moderator of the session, Mr. SP Chandak, former Deputy Director, UNEP & Professor Emeritus, BIMTECH. The broad features of the UNEP – NPC project on identifying countermeasures for riverine marine plastic litter was also introduced to the participants.

Mr. Chandak thanked the organizers and appreciated the idea of the virtual National Policy workshop, and highlighted that in this way, we are able to control the carbon footprint, which would have been generated otherwise. He shared his perspectives on the webinar theme and thereafter opened the forum for the resource speakers.



Dr. Harsh Thukral



Mr. SP Chandak

## PRESENTATION 1:

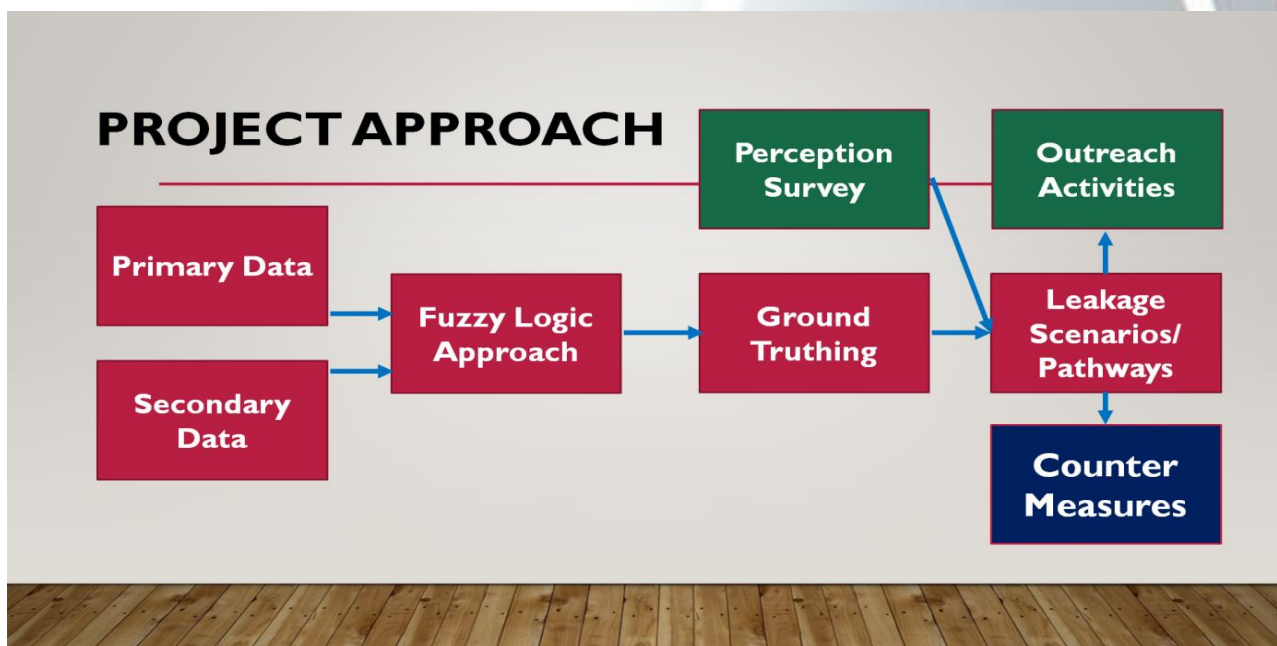
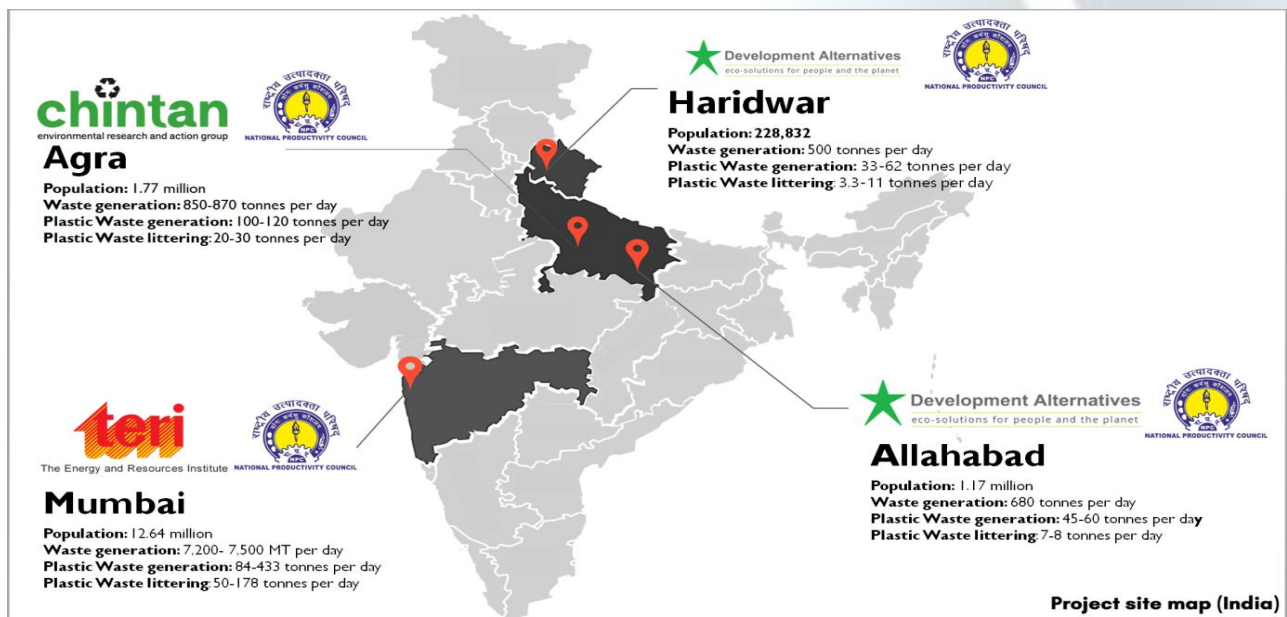
### Introduction of the Counter Measure Project by Ms. Saloni Goel, UNEP



The first presentation by Ms. Saloni Goel, UNEP reflected on the aspects of the counter measure project in India, the 4 cities which were chosen for detailed study (namely Agra, Haruidwar, Allahabad/Prayagraj and Mumbai) and the approach which was adopted during

the execution of the project. She spoke about how the primary data and secondary data were collated and with the help of fuzzy logic, a plastic leakage scenario was developed for each of the 4 cities and further it was substantiated by ground truthing.

She further deeply acknowledged the efforts of the partner agencies in this project which were engaged to carry out the perception survey studies and outreach activities as undertaken by M/s Chintan (at Agra), Teri (at Mumbai) and Development Alternatives (at Haridwar and Prayagraj). She also acknowledged the funding agency, Government of Japan, Ministry of Foreign Affairs and other UNEP initiatives on Marine Litter, like the Indo-Norway Marine Pollution Initiative, Tide Turner Challenge, and Un-Plastics Collective.



She highlighted that the outreach activities carried out under this project enabled the engagement of communities and students in the promotion of counter measures. She even

quoted an epic example of how the outreach activity created awareness amongst boatmen and they had now started keeping garbage bins in their boats to control littering of waste.

She concluded her presentation with need for attention to the following:

- Circularity needs to be strengthened- to reduce entry of virgin plastics in plastic value chain and leakage of plastic waste
- Plastic bans need to cover both production and use. Additionally, they need to be strengthened with robust regulatory and monitoring capacity. Good practices need to be documented and disseminated.
- Incentivise investment in development of alternatives.
- Strengthen incentives and mechanisms for collection of plastic waste for integration into a value chain- EPR, Deposit Refund Schemes, Garbage Cafes, Kiosks (providing mobile recharge facility) etc.
- Emphasis and incentives for innovative product design to support recyclability- easy dismantling, replaceable/changeable parts for enhanced life, alternatives to hazardous additives, compostable/re-useable/recycleable product packaging.
- Effective waste management infrastructure (littering @ 10-25% found to be significant culprit for plastic leakage).
- Civil society led clean-ups.
- Regular monitoring and evaluation network to inform local, national and regional action.

Further Madam Saloni enumerated key project outputs & outcomes as follows.

- Region Based Approach for mapping plastic leakage hotspots
- Ground data on plastic waste generation and disposal
- Leakage Scenarios and Countermeasures
- Research and technical capacity for extension in other regions
- Partnerships and capacity for sustained action
- Outreach material in English, Vernacular Languages, Braille- video, audio, written
- Recommendations for policy

## **PRESENTATION 2:**

### **Understanding plastics for their utility and environmentally safe handling by Dr. Vijay G. Habbu, Adjunct Professor, Institute of Chemical Technology (ICT)**

The second presentation was undertaken by Dr. Vijay G. Habbu, Adjunct Professor, Institute of Chemical Technology (ICT). Dr Habbu gave insights on the science and polymer component of plastic and emphasized on how there has been fascinating evolution of synthetic plastics over the past 110 years. He discussed about Polymer Identification Codes and various categories of plastics being utilized by us in our day to day lives. He also deliberated on the Plastic Articles Manufacturing Process and Growth in Global Plastics Production. It was highlighted that plastics have numerous advantages ranging from light weight, durability,



insulation, versatility to cost effectiveness and that plastics have no functional equivalents. He differentiated rigid packaging and flexible packaging varieties and key polymers that are used including mono-polymer based, multi-polymer based and multi-material based packaging.



He noted that in spite of abundant advantages, the visibility of its litter is out screaming the superiority of its eco-footprint. Dr. Habbu further explained about the EPR perspective of Plastics litter management and Plastics life-chain. He also explained how the Market for recycling plastics in India has emerged and highlighted examples of products made from recycled plastics. He acknowledged that there is enhanced focus on microplastics which has emerged as a new challenge when it comes to plastic pollution.

Towards the end of presentation, Dr. Habbu flashed how plastic is in the service of Nation in the times of COVID-19, by means of use in relief & rescue work and several PPEs which are being utilized by millions of doctors, health care staff, sanitary workers and even general public.

His key recommendations for handling plastic specified the multi-pronged approach by the :

- **Government/ Administration:** in education, awareness, infrastructure, enforcement and policy formulation
- **Citizens:** in source segregation, reduce and reuse
- **Industry:** innovative design for collectability, recycling, prevention of litter generation etc.

### PRESENTATION 3:

**Problem of Marine Litter and Initiatives by MoES regarding Plastic Pollution Assessment by Dr. Pravakar Mishra, Scientist 'F', National Center for coastal research (NCCR), MoES**

The third presentation was delivered by Dr. Pravakar Mishra, Scientist 'F', National Center for coastal research (NCCR), MoES. He began with the Scale of Plastic Problem in India and particularly how marine plastics pollution has reached at its crisis levels.



The image shows a screenshot of a webinar presentation slide on the left and a Zoom meeting interface on the right. The slide is titled "National Policy Workshop Webinar Series on Counter measures for Riverine and Marine Plastic Litter in India 12 -22 May 2020". It is for "Session 1: The Science and technology of Plastics & techniques/best practices of plastics pollution assessment and investigation". The current slide is "Page 1" and is titled "Problem of Marine Litter and Initiatives by MoES regarding Plastic Pollution Assessment" by "Dr Pravakar Mishra, Scientist F, National Center for Coastal Research (NCCR), Ministry Earth Sciences, India". The Zoom interface on the right shows a video feed of Dr. Pravakar Mishra and a list of participants including NPC INDIA (Host), Pravakar Mishra, Amit Jain, Arun Kumar Jha, Basanta Das, and odkale.

He described about the MoES program on Marine Litter & Micro plastics comprising of :

- Sources, Fate of plastic ; Quantification & Modelling
- Impact of plastic pollution on marine eco-systems
- Micro-plastics and health- Toxicity – Food chain
- Social and behavioral change / Awareness campaign
- Design and testing interventions
- Re-designing of the single use of plastics

He elaborated on Studies carried out so far along Indian coast and Marine litter along the Indian beaches and state wise composition of marine litter in India. Further he gave insights on tools and techniques for Water sample collection & Processing for microplastics, Sediment collection & Processing for microplastics. He also discussed about microplastics in coastal waters and in commercial fish species

Finally he gave A few key recommendations pertaining to

- Development of a National Marine Litter policy
- Segregation of the wastes at source
- Responsibility should be of the manufacturer / seller to recycle the used plastic products from the consumers
- Adoption of beaches for regular monitoring
- Deployment of low cost traps in rivers, creeks, canals - Cleaning and monitoring activities.
- Introduction of bio-degradable materials
- Exploring opportunities and benefits of shifting to a circular plastic economy.

**PRESENTATION 4:**

**Plastics Consumption and Disposal-Methodology for Waste Plastics Assessment in India by Dr. Smita Mohanty, Director, CIPET**



The fourth presentation was delivered by Dr. Smita Mohanty, Director, CIPET. She began with the statistics related to the plastic consumption in India and tagged the plastic products demand growth drivers in India wrt Agriculture, Infrastructure, Packaging industry , automotive appliances, medical & personal care etc.

She also delved on the statistics of plastic waste generation in India, the quantity of which is collected and the uncollected. Dr. Mohanty further shared details about categorisation of single use plastic products and careful assessment of their impact and concerns. She gave insights about innovative and collaborative approach to address the challenges of single use plastic systematically adhering to the waste management hierarchy. She briefly touched upon the recycling process and techniques adopted in India, comprising of collection, sorting, shredding, cleaning, melting and reusing.

Dr. Mohanty elaborated on the aspects of value addition of recycled plastic packaging material in India and economic aspect of recycling in India. She highlighted the facets of Extended Producer Responsibility (EPR) and significance of Design for Environment, Resource Security and about Sharing and Transfer of the responsibility/cost of collection & disposal.



## PRESENTATION 5:

### Methodology for Micro-Plastic Assessments in Rivers & Oceans and Constraints by Dr. Mahua Saha, Sr. Scientist, NIO



The fifth session was taken up by Dr. Mahua Saha, Senior Scientist, Chemical Oceanography Division (COD), National Institute of Oceanography (NIO).

She discussed about the sampling methodology undertaken during the conduct of her study as part of the project with NPC and UNEP, and also shared the details of quantification and characterization of micro plastic waste samples collected. She presented the findings and results of the micro plastic sampling and assessment undertaken by NIO at 6 locations under this project, in the river basins of Ganga, Yamuna in Agra and Prayagraj. She indicated that over 30 types of polymers were detected in a sample of microplastics samples from one of the river stretches.

She elaborated on the challenges faced in the process of surface water sampling and corrective measures to be taken.

## PRESENTATION 6:

### Approach of Sampling & Analysis in Sediments of River Ganga by Dr. Basanta Kumar Das, Director, CIFRI

The sixth presentation of session 1 was given by Dr. Basanta Kumar Das, Director, Central Inland and Fisheries Research Institute (CIFRI). He delved on plastics transport to rivers, plastic transformation in aquatic bodies and subsequently its effects on aquatic biota. He reflected on estimates of Microplastics in the World in terms of river sediment, lacustrine sediment, beach sediment and marine sediment.

The image shows a screenshot of a webinar presentation slide on the left and a Zoom meeting interface on the right. The slide features the UN Environment Programme logo, the NPC logo, and the Counter Measure logo. The text on the slide reads: "National Policy Workshop Webinar Series On Countermeasures for Riverine and Marine Plastic Litter in India 12 -22 May 2020". Below this, it says "Session 1: The Science and technology of Plastics & techniques/best practices of plastics pollution assessment and investigation". A red arrow points to the title "Approach of MPs sampling and analysis in sediments of river Ganga". The presenter is identified as Dr. B. K. Das, Director, ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata, 700120. The Zoom interface on the right shows a video feed of a man with a mustache and glasses, and a list of participants including NPC INDIA (Host), Basanta Das, Amit Jain, Arun Kumar Jha, Siddhanta, and Dr. Vijay Habbu.

The case of sediment sampling at river Ganga was explained by him in detail. He highlighted how the Sediment sampling from Ganga was carried out and how the sampling locations were frozen and the tools/ techniques used. He then presented on the methodology and key steps of sieving, density separation and peroxide digestion involved in the Extraction of Microplastics from the samples collected. The Findings of Microplastics found in River Ganga was explained. The ATR-FT-IR spectrum of microplastics found from River Ganga was shown. The quantification of Microplastics in Ganga was depicted in the presentation in terms of mass fraction of plastics and no. of plastics per kg of sediment. The results were also correlated with water pollution parameters like phosphate concentration of sediment and water, and with BOD of water. His recommendations included :-

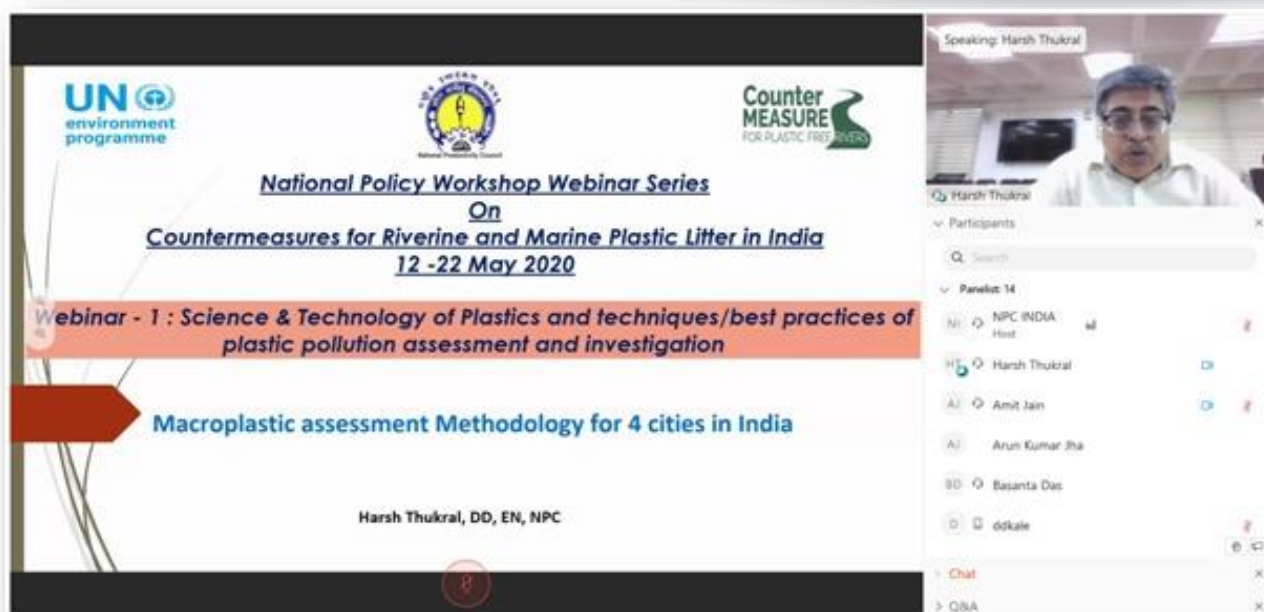
- Immediate measures to be taken to reduce plastic load in the Indian rivers
- Need of more comprehensive study on the plastic transport, fate and toxicity toward life
- Need of extensive studies to assess microplastics contamination and their distribution in Indian rivers, associated wetlands, lakes and others
- Need of Government support and more funding to execute the research activities in this direction

#### **PRESENTATION 7:**

#### **Methodology for Macro-plastic Assessments in four Cities, India by Dr. Harsh Thukral, Deputy Director, NPC**

The final presentation of the session was delivered by Dr. Harsh Thukral, Deputy Director, NPC. He presented about the details of 19 clean up drives that were taken up by NPC for Macro plastic sampling and assessment in 4 cities of India, with the help of partner agencies and local volunteers. He elaborated on the protocols that were developed for carrying out the clean up drives.





He emphasized that the Standard operating procedures were developed to structure the over all clean up drive and define the step wise activities to be performed within a specific time frame. Since the clean-up activities were executed with the help of local volunteers comprising of representatives of partner agencies, local NGOs, sanitary workers etc., the SOP helped in enabling the participants/volunteers of clean up group to acquaint with the proceedings and accomplish the tasks. The procedure reflected on aspects of demarcation of boundary for clean-up area, wearing of personal protective equipment, collection of mixed waste, filling in gunny bags, labelling of gunny bags, segregation of plastic waste and weighing of waste in two key stages, categorizing the plastic waste collected etc. The posters were developed showcasing the various categories of plastic and non plastic waste to be collected and segregated. The Do's and Don'ts were also developed for the clean up drive.

Further, he explained about the trash data sheet that was maintained in all clean ups to maintain the uniformity in reporting the categories of waste plastics found during clean ups. The prominent product based plastic waste litter types found during Clean Ups in 4 cities was highlighted by him besides the fact that about 53 varieties of plastic litter types were identified during the 19 clean – up exercises.

He concluded the presentation indicating the way ahead in terms of Integrating primary data based research and econometric studies of various focus areas with secondary data and data obtained via IoT system / devices, Continual application of GIS tools and modeling components for site selection and assessments and recording inputs for analysis, Assessment needed at all nodes of waste disposal and reverse logistics chain and Encouraging FMCG companies, manufacturers of plastics packagings and components and plastics products producers, including brands, to engage in product composition declarations including for plastics content

## KEY QUESTIONS RAISED BY ATTENDEES / PARTICIPANTS

The session was concluded by answering of a series of questions by the speakers and panellists that were put up by several participants in the workshop.

The nature of questions that were received and reflected upon by the speakers and panellists is indicated in the set of questions below :-

1. If any protocols were available for finding microplastic in urban atmospheric dust ?
2. If any protocols were available for measuring microplastics in SPM and in fluvial sediments in urban river
3. How can information about circular economy especially for plastics be disseminated among citizens?
4. What are the chances of releasing of microplastics from recycled plastics based products
5. How can your research be utilised for making public more aware of the micro plastics- whether any national dashboard on impact of microplastics for public data analytics exists or planned ?
6. What methodology was adopted by CIPET for assessment of plastic waste in 60 cities in India
7. What kind of polymers are found in Chips packets and what polymers are present in Tobacco sachets
8. What are instruments, tools and technologies utilised by CIPET in undertaking plastic waste assessment
9. What are the new initiatives NCCR is planning to undertake in order to assess and prevent marine plastic litter?
10. Is RO drinking water having microplastics in it as used filtration media is made up of Plastic fibre material? Etc...

## SALIENT FEATURES OF THE WEBINAR 1

The sessions highlighted the following. (a) The importance of plastics and various polymers and their applications in a vast spectrum of products, and the concern that humanity has an instinct to discard especially single use plastics, and that there is a need to revisit the behavioural approach to managing plastics including towards segregation (b) While all plastics are not recyclable or most have limits to degrees of recyclability, there is a need to have a system of well segregated plastic waste collection and recycling initiatives and that suitable labeling of the polymer types could facilitate for products in the market including value addition back to original products and for circular economy to be realised; (c) The need to draft a national marine litter policy to control and manage the litter at the land boundary to prevent from entering the marine environment; (d) The importance of a detailed material balance of plastics production and consumption, and constructing a detailed leakage scenario; (e) Attention to periodic and geographically dispersed macroplastics assessments including the importance of polymer analysis at the plastic litter end; (f) Significance of comprehensive studies and mapping of microplastics in River Ganga and all rivers and linking / correlating to macroplastics in hotspots; (g) The development of a standardized methodology for clean-up exercises for adoption (h) The application of various methods in the analysis and

identification of macro and microplastics and identifying polymers; (i) The deliberations highlighted the methodology and framework adopted for the project, reflected on various types of plastic litter identified in trash during clean – up studies in 4 cities and indicated the efforts ongoing to develop a toolbox on plastic leakage scenario development and the need for constructing a harmonized methodology.

## ENCLOSURES

- **Press Release (s)**
- **Programme Agenda**
- **Session Flyer**
- **Concept Notes**
- **Presentation by each resource speaker**





## PRESS RELEASE

13 MAY 2020

National Productivity Council, under DPIIT, Ministry of Commerce and Industry, Govt. of India is organizing the National Policy Workshop through a series of the webinar during 12-22 May 2020 comprising of six on-line sessions as part of the UNEP lead project “Promotion of countermeasures against marine plastic litter in Southeast Asia and India” funded by the Govt. of Japan. Webinar 1 on the theme ‘The Science, Technology of Plastics & Techniques/Best Practices of Plastics Pollution Assessment and Investigation’ as part of the National Policy Workshop on Countermeasures for riverine and marine plastic litter has been organized on 12 May 2020 during 14.30 – 17.30 hrs.

The sessions highlighted the following. (a) The importance of plastics and various polymers and their applications in a vast spectrum of products, and the concern that humanity has an instinct to discard especially single-use plastics, and that there is a need to revisit the behavioral approach to managing plastics including towards segregation (b) While all plastics are not recyclable or most have limits to degrees of recyclability, there is a need to have a system of well-segregated plastic waste collection and recycling initiatives and that suitable labeling of the polymer types could facilitate for products in the market including value addition back to original products and for the circular economy to be realized; (c) The need to draft a national marine litter policy to control and manage the litter at the land boundary to prevent from entering the marine environment; (d) The importance of a detailed material balance of plastics production and consumption, and constructing a detailed leakage scenario; (e) Attention to periodic and geographically dispersed macroplastics assessments including the importance of polymer analysis at the plastic litter end; (f) Significance of comprehensive studies and mapping of microplastics in River Ganga and all rivers and linking / correlating to macroplastics in hotspots; (g) The development of a standardized methodology for clean-up exercises for adoption (h) The application of various methods in the analysis and identification of macro and microplastics and identifying polymers; (i) The deliberations highlighted the methodology and the framework adopted for the project, reflected on various types of plastic litter identified in the trash during clean – up studies in 4 cities and indicated the efforts ongoing to develop a toolbox on plastic leakage scenario development and the need for constructing a harmonized methodology.

The webinar was attended by 700 plus participants as located across 12 countries representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions such as UN Organisations and the World Bank. The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders.

The upcoming webinars are scheduled on 14, 16, 18, 20 and 22nd May 2020 and shall be leading to a policy dialogue on the subject. The participants can register for the webinars via <https://www.npcindia.gov.in/NPC/User/unep>


National Productivity Council  
5-6 Institutional Area, Lodi Road,  
New Delhi 110003  
Ph: 24607313



## **WEBINAR 2**

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**COMMUNITY PERCEPTIONS AND BEHAVIOURAL ASPECTS FOR PLASTIC  
MANAGEMENT AND PROMOTION OF COUNTERMEASURES TO ADDRESS  
(RIVERINE AND MARINE) PLASTIC LITTER**





## Concept Note

### WEBINAR 2

Date: 14<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Theme:

Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address (Riverine and Marine) plastic litter.

#### Background:

India generates approximately 9.4 million tonnes of plastic waste every year, and out of this approximately 60 percent of plastic waste is recycled and rest 40percent is left uncollected or littered (source: Ministry of Housing and Urban Affairs, March 2019), which often ends up in open areas or drains and eventually in the river bodies. There is an urgent need to curb the plastics ending up in the Ganga and other rivers by providing alternatives to plastics, improved management of plastic waste, promoting awareness amongst locals and tourists / visitors. In order to achieve this, there is a need to understand the perception of various stakeholders in the city on plastic waste – its source, impact, major contributors, their current actions and overall willingness to prevent it from going into the river.

#### Objective:

Exploring and reflecting upon awareness levels regarding plastic consumption and disposal implications, and approaches to enabling behaviour change in society. Highlighting case examples from 4 cities (including tourist and pilgrimage sites) and engagement of various stakeholders in the process.

#### The session shall cover the following topics:

- Perception survey for Plastics Consumption and Waste Management in Agra city, Prayagraj and Haridwar, and Mumbai - Case examples of the UNEP project.
- Programmatic engagement of children and behavioral shift towards plastics management.
- Plastics manufacturers and industry response to single use plastic phase out.
- Case study : Engaging citizen for Door-to door collection of segregated waste along with GPS tracking of vehicles carrying waste in Mumbai by BMC.
- Swachh Survekshan-The competitive approach to behaviour transition in city region.
- Acceptance of change towards transitioning to use plastic alternatives in society.
- Media and waste segregation pursuit- Is change occurring.
- Response and effect of single use plastic ban in selected cities (Mumbai/ Bangalore).
- Participative methodology for online perception survey towards educative behaviour shift.

#### Expected Outcome:

Recommendations for enhancing community participation by instilling behaviour change leading to sustainability of countermeasures to prevent plastic littering.



## AGENDA

## Webinar 2

## Community Perceptions and Behavioural Aspects for Plastic Management and Promotion of Countermeasures to address (Riverine and Marine) Plastic Litter

14 May 2020 | 14:30 – 17:00 hrs

**Moderator:** Mr. SP Chandak, Former Deputy Director UNEP & Professor Emeritus, BIMTECH

**Coordinator:** Ms. Nikita, Assistant Director, NPC

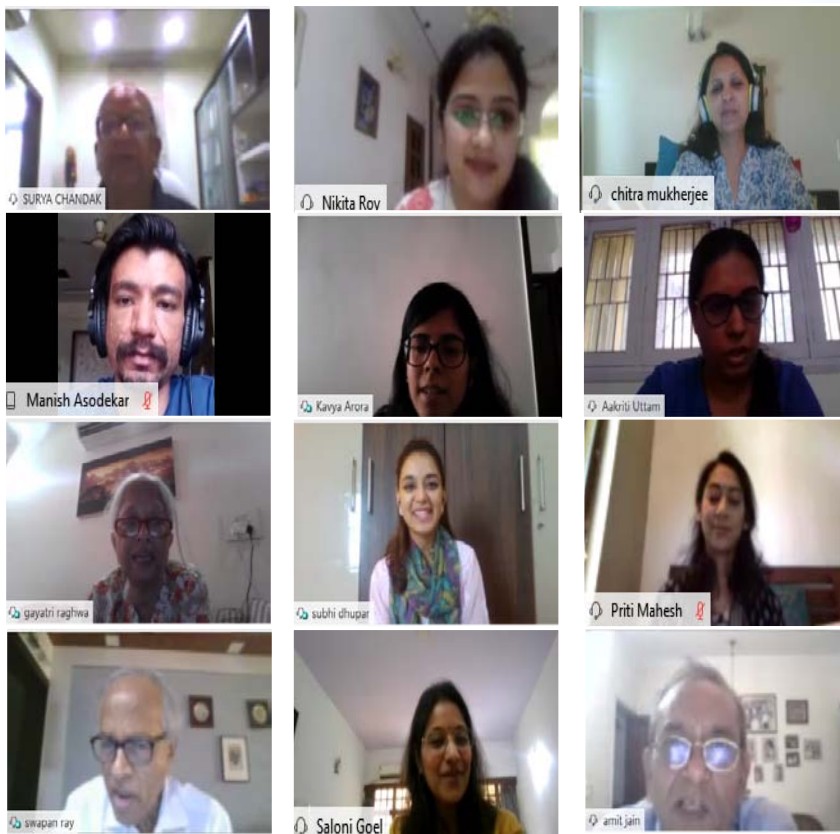
Time (hrs)	Theme/Topic	Speaker
14:30 – 14:35	Introduction of the Session	Ms. Nikita, Asstt. Director, NPC
14:35- 14: 50	Case Study of Perception Survey for Agra City	Ms. Chitra Mukherjee, CHINTAN
14:50- 15:05	Case study of Perception survey for Mumbai City	Ms. Anjali Parasnis, TERI
15:05 – 15:20	Case Study of Perception Survey for Prayagraj and Haridwar Cities	Ms. Aakriti Uttam & Ms. Kavya Arora, Development Alternatives
15:20 – 15:35	Promoting Youth Education and Advocacy for Mitigating Plastic Pollution-Case Study of UNEP'sTide Turners Plastic Challenge	Ms. Gayatri Raghwa, Tide Turners
15:35 – 15:50	Opportunities and Challenges in Engaging Faith Based Organizations in Abating Marine Pollution	Ms. Subhi Dhupar, United Religions Initiative(URI)
15:50 – 16:05	Single use Plastic - Seas at Risk	Ms. Priti Mahesh, Toxics Link
16:05 – 17:00	Panel Discussion: Recommendations for enhancing community participation by instilling behaviour change leading to sustainability of countermeasures to prevent plastic littering  Questions / Answers	Additional Panel Members: Ms. Nalini Shekar, Hasiru Dala Mr. Swapan Ray, ICPE, Advocate Afroz Shah, Afroz Shah Foundation Ms. Saloni Goel, UNEP Mr. Amit Jain, IRG System South Asia Mr. K D Bhardwaj, NPC



## Proceedings

# National Policy Workshop Webinar Series on “Countermeasures for Riverine and Marine Plastic Litter in India”

14 May 2020 | 14:30 – 17:00 hrs



## WEBINAR 2

# Community Perceptions and Behavioural Aspects for Plastic Management and Promotion of Countermeasures to address (Riverine and Marine) Plastic Litter

## WEBINAR 2

### Proceeding

## Community Perceptions and Behavioural Aspects for Plastic Management and Promotion of Countermeasures to address (Riverine and Marine) Plastic Litter

14 May 2020 | 14:30 - 17:30 hrs

#### Moderator

**Mr. SP Chandak,**

*Former Deputy Director, UNEP & Professor Emeritus, BIMTECH*

#### Coordinator

**Ms. Nikita,**

*Assistant Director, NPC*

### INTRODUCTION

India generates approximately 9.4 million tonnes of plastic waste every year, and out of this approximately 60 percent of plastic waste is recycled and rest 40 percent is left uncollected or littered (source: Ministry of Housing and Urban Affairs, March 2019), which often ends up in open areas or drains and eventually in the river bodies. There is an urgent need to curb the plastics ending up in the Ganga and other rivers by providing alternatives to plastics, improved management of plastic waste, promoting awareness amongst locals and tourists / visitors. In order to achieve this, there is a need to understand the perception of various stakeholders in the city on plastic waste – its source, impact, major contributors, their current actions and overall willingness to prevent it from going into the river.

The objective is towards exploring and reflecting upon awareness levels regarding plastic consumption and disposal implications, and approaches to enabling behaviour change in society. Highlighting case examples from 4 cities (including tourist and pilgrimage sites) and engagement of various stakeholders in the process.

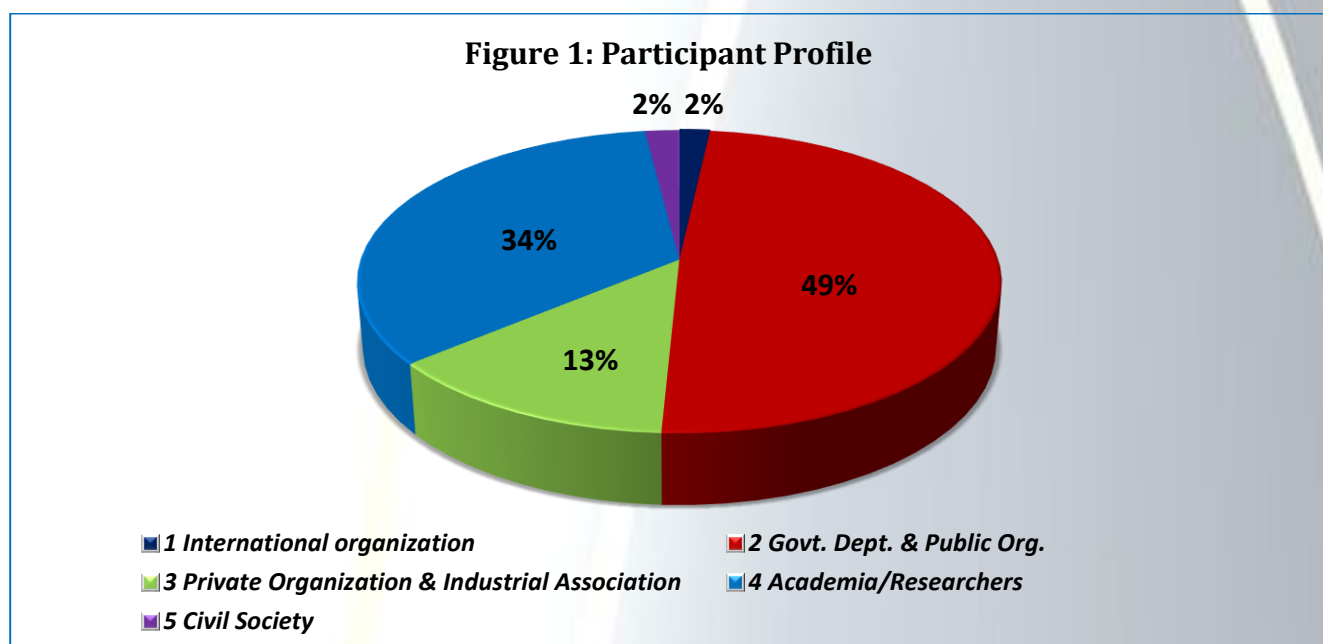
### WEBINAR 2 AGENDA

Time (hrs)	Theme/Topic	Speaker
14:30 – 14:35	Introduction of the Session	Ms. Nikita, Asstt. Director, NPC
14:35- 14: 50	Case Study of Perception Survey for Agra City	Ms. Chitra Mukherjee, CHINTAN
14:50- 15:05	Case study of Perception survey for Mumbai City	Mr. Manish Asodekar, TERI

15:05 – 15:20	Case Study of Perception Survey for Prayagraj and Haridwar Cities	Ms. Aakriti Uttam & Ms. Kavya Arora, Development Alternatives
15:20 – 15:35	Promoting Youth Education and Advocacy for Mitigating Plastic Pollution-Case Study of UNEP'sTide Turners Plastic Challenge	Ms. Gayatri Raghwa, UNEP's Tide Turners plastic Challenge
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### WEBINAR PARTICIPATION

The webinar was attended by 450 plus participants. The participants were from across various sectors (public / private organizations, civil society, academia, and from across a range of national and multilateral institutions). The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders. The participant profile details are depicted in **Figure 1**.



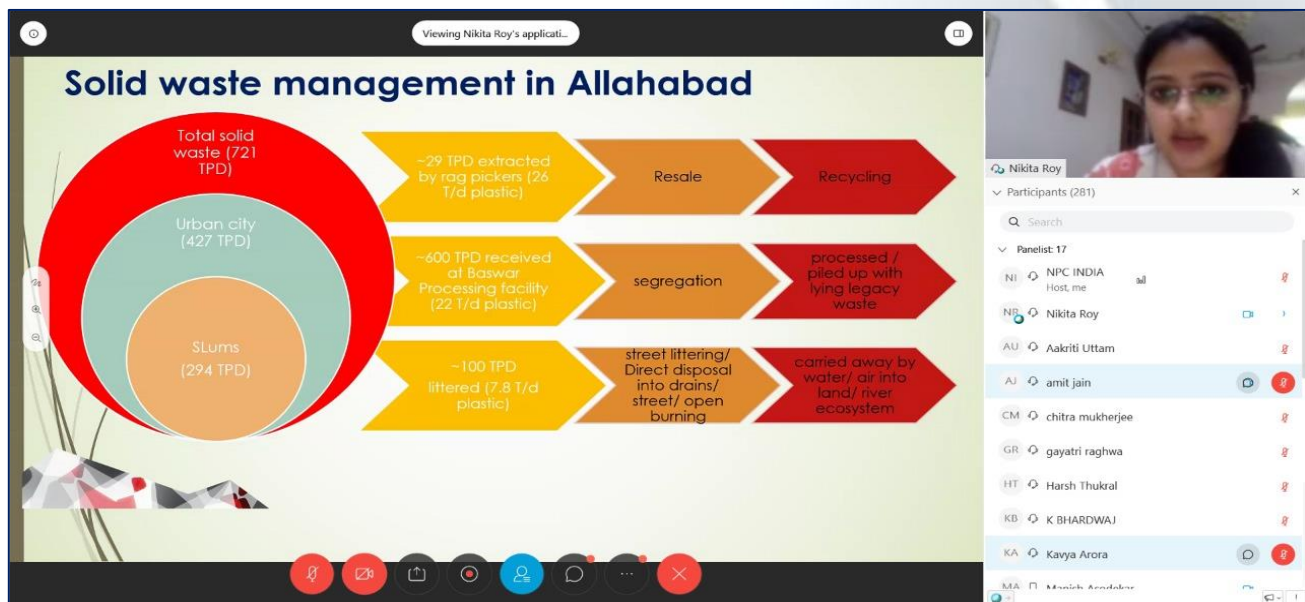


## OPENING REMARKS

All the speakers, panelists and attendees were welcomed by the moderator of the session, Mr. S.P. Chandak, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH. Mr. Chandak briefed the audience about the first webinar session held on 12 May 2020 and sought the speakers to initiate presentations and to highlight essence in more detail.

## PRESENTATION 1:

### Assessment of plastic pollution by NPC in 4 cities by Ms. Nikita, Assistant Director, NPC



In the first presentation of Webinar 2 Ms. Nikita acknowledged the efforts and support of the of the partner agencies in the project, especially carrying out the perception survey studies and outreach activities in the four cities, namely Prayagraj, Mumbai, Agra and Haridwar. To set the stage for discussing the outcomes of the perception surveys undertaken under the project, she presented the key findings of assessment of plastic pollution & plastic leakage scenario carried out by NPC in the 4 cities, as part of the deliverables under the counter measures project.

She explained about the three steps methodology adopted to assess the plastic leakage in the cities including a combination of analysis of secondary data, primary data and preparation of mass balance of waste generated, collected, treated and disposed.

She shared the summary of quantity of plastic leakage, prominent plastic categories and their sources as assessed by NPC. The presentation was supported by several images depicting the scenario of plastic litter at several hot spots in the cities.

The pathways of plastic leakage into the riverine system via the means of drains, water channels, direct disposal etc., were reflected upon and various photographs and plates as captured during the course of the project enabled a visual overview of the project activities as undertaken.

## PRESENTATION 2:

### Development and Dissemination of a tailor-made set of Outreach Activities to Sensitize and Engage Communities and Stakeholders at Agra by Ms. Chitra Mukherjee, CHINTAN



The image shows a screenshot of a webinar presentation slide on the left and a video call interface on the right. The slide features the UN Environment Programme logo, the National Policy Council logo, and the Counter Measure for Plastic Free Rivers logo. The main text on the slide reads: "National Policy Workshop Webinar Series On Countermeasures for Riverine and Marine Plastic Litter in India 12 -22 May 2020". Below this, a red banner contains the text: "Session 2: Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address". A green arrow points to the title of the presentation: "Development and Dissemination of a tailor-made set of Outreach Activities to Sensitize and Engage Communities and Stakeholders at Agra". The presenter is identified as "Presented by: Chitra Mukherjee, Head-Avocadoy and Policy, Chintan". The video call interface shows a participant named "chitra mukherjee" and a list of other participants including Oinam Samuel Me, NPC INDIA Host, Aakriti Uttam, amit jain, gayatri raghwa, and Harsh Thukral. The interface also includes a search bar, a list of participants, and a Q&A section.

In the second presentation made by Ms Chitra Mukherjee, of M/s CHINTAN, the insights on overall strategy and approach adopted for the outreach activities to Sensitize and Engage Communities and Stakeholders at Agra were detailed. She elaborated on the methods and tools of engagement and about scenario on Perception and Behaviour for Riverine Plastic Litter in Agra. Further, regarding the use of stratified random sampling the selection of survey and outreach participants were made. The perception survey identified the key users of plastic and the plastic waste generators, i.e. households, offices, commercial establishments, shops and institutions/schools.

She presented the snapshots of outreach activities carried out in Agra and specifically detailed about the Plastic Free Taj Mahotsav Event done at Agra. She further spoke about the behavioural change and shift aspect at Agra where the students, communities and volunteers they had engaged adopted practices like Switching from plastic bottles to sustainable steel glasses and tiffin boxes; Substituting Plastic shopping bags with cloth bags; Composting, Paper bin liners and Cloth bags; Women adapting composting pit in society; engaging in Plastic Clean up drives etc.



She showcased the key responses from the stakeholder meetings, where the stakeholders highlighted that they are aware that burning plastic is dangerous and harms environment by choking drains, death to animals by ingesting plastic etc. The positive features of plastics which ironically are also a problem considering plastic items are economical to procure, are durable and easy to use as opposed to alternatives have been highlighted as well.

Her key recommendations included need for plugging the loopholes- eg. Ban on Non woven bags; promoting Green Procurement by Government, including state and municipality to limit plastic usage; Inclusive Recycling to ensure smooth plastic recycling and Building Capacity to use the Legal Provisions.

### PRESENTATION 3:

#### Case study of Mumbai-Perception And Behaviour Towards Use Of Plastic And Its Management by Mr. Manish Asodekar, Research Associate, TERI

The image shows a Zoom webinar interface. The main slide is titled "National Policy Workshop Webinar Series On Countermeasures for Riverine and Marine Plastic Litter in India 12 -22 May 2020". It is Session 2: Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address Perception And Behaviour Towards Use Of Plastic And Its Management Mumbai Story. The slide includes logos for UN Environment Programme, National Policy Council, and Counter Measure for Plastic Free Rivers. It also mentions the project time frame (October 2019 - March 2020), implemented by TERI, and presented by Mr. Manish B. Asodekar, Research Associate, TERI, on May 14th, 2020. On the right, a video feed shows Manish Asodekar speaking. Below the video is a participant list with 18 names, including Oinam Samuel, NPC INDIA (Host), Aakriti Uttam, amit jain, chitra mukherjee, gayatri raghwa, and Harch Thukral. A Q&A section is also visible at the bottom right.

The third presentation was delivered by Mr. Manish Asodekar, TERI. He highlighted the campaign “RETHINK PLASTIC” – A UNEP-TERI joint initiative in Mumbai region, under which several outreach activities were carried out. The stakeholders covered under the outreach activities comprised of academia, research institutes, industries/corporates, grass root organizations, government, NGOs/Foundations, media as well as differently abled communities.

He discussed about the strategies and tools of engagement of the stakeholders. He presented a case study of outreach conducted at the Gateway of India and Elephanta Island where volunteers

from K.C College of Mumbai were engaged to seek response from more than 100 tourists regarding the establishment of waste management system at the island.

Talking about the perception of people in Mumbai with respect to plastic usage, he highlighted that the respondents shared that they cannot completely avoid plastic usage and that even manufacturing of plastic alternatives would require huge resources such as wood, bamboo, metal etc. He highlighted that there is a huge opportunity for bringing behavioural change among the people and the possible actions in this direction could be by creating awareness, capacity building, practicing segregation from school level and by imposing heavy penalty on usage of single use plastics. He further discussed about the cleanup drives which were carried out to understand the behaviour of stakeholders with regard to plastic waste . The first hand reaction of Volunteers after participating in cleanup drives was a sense of outrage, and by seeing the actual ground reality; they took a pledge to not use single use plastic , committed self to engage in such activities regularly and promised to share their experience with other stakeholders.

He also shared the findings of the stakeholder consultations, where it was identified that it is required to focus on sustainability and environmental impact of plastics. From the policy dimension, it was recommended to identify hotspots, incentivize plastic recycling, prompt implementation of bans and laws and make state wide action plan and road map.

#### PRESENTATION 4:

**Sustaining the countermeasures initiative - Learning from behaviour change communication in Haridwar and Prayagraj by Ms. Kavya Arora and Ms. Aakriti Uttam from Development Alternatives.**

The screenshot displays a Zoom webinar interface. On the left, a presentation slide is visible with the following content:

- Logos for UN environment programme, National Productivity Council, and Counter MEASURE FOR PLASTIC FREE RIVERS.
- Title: **National Policy Workshop Webinar Series**
- Subtitle: **On Countermeasures for Riverine and Marine Plastic Litter in India**
- Date: **12 -22 May 2020**
- Session Title: **Session 2: Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address**
- Topic: **Sustaining the countermeasures initiative - Learning from behaviour change communication in Haridwar and Prayagraj**
- Logo for Development Alternatives.

On the right side of the interface, a video feed shows a participant speaking, with the name "Speaking: Aakriti Uttam" above it. Below the video feed is a list of participants:

- Aakriti Uttam (Host)
- Participants (337)
- Panelist: 18
- OS - Oinam Samuel Me
- NI - NPC INDIA Host
- KA - Kavya Arora
- AU - Aakriti Uttam
- AJ - amit jain
- CM - chitra mukherjee
- GR - navatri ranhwa

At the bottom of the interface, there are icons for mute, video, chat, and other controls, along with a "Q&A" section.



**UN environment programme**

**Counter MEASURE FOR PLASTIC FREE RIVERS**

**National Policy Workshop Webinar Series**  
**On**  
**Countermeasures for Riverine and Marine Plastic Litter in India**  
**12-22 May 2020**

**Session 2: Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address**

Sustaining the countermeasures initiative - Learning from behaviour change communication in Haridwar and Prayagraj

**Development Alternatives**

Speaking: Kavya Arora

Participants (335)

Panelist: 18

- OS Oinam Samuel Me
- NI NPC INDIA Host
- KA Kavya Arora
- AU Aakriti Uttam
- AJ amit jain
- CM chitra mukherjee
- GR navatri ranhwa

In this presentation the findings of perception surveys undertaken at Prayagraj and Haridwar were highlighted. It was indicated that plastic cans are one of the major plastic item used by the visitors; clothes and plastic sheets are found in river waste; primary reason for use of the plastic is its low cost and wide availability; and that inadequate or lack of bins on streets was leading to plastic litter.

They collated the key factors that led to plastic litter in these two cities of religious significance amongst behavioral, infrastructural and systemic issues. The achievements of the outreach activities carried out were reflected via connect and engagement with stakeholders, through awareness by IEC (Information, education & communication) tools, and related material & via social media and reflected on the **Mega Event – Humara Sankalp Plastic Mukta Ganga**, organised at major location – Sangam and Har Ki Paudi which was attended by city administration, Civil Society, Faith leaders, academia and more than 2000 people in both the cities.

She further discussed about the approach and strategy adopted during the study. In the end she elaborated on the aspects of communication carried out for behavioral change in both cities and also showcased the key gaps identified in plastic waste management.

Some of the key recommendations included:

- Continuous capacity building and awareness generation programs
- Municipality+CSO led promotion of alternatives
- Working extensively with faith based leaders, and seeking their contribution to spread the message
- Basic infrastructure upgrade – dustbins installed at a 50m distance on prime locations
- Informal waste collectors to be included in the system to recover maximum resources during collection

- Slums to be included on the collection map
- Pilot demonstration of some waste recycling/ co-processing solutions
- Govt schemes such as SBM, Namami Gange to be synergized with Municipal level waste management system and initiatives such as UNEP countermeasures.

#### PRESENTATION 5:

#### Promoting Youth Education and advocacy for mitigating plastic pollution'- Case Study of UNEP Tide Turners Plastic Badge by Ms. Gayatri Raghwa, UNEP's Tide turner plastic Challenge

The image shows a Zoom webinar interface. On the left is a presentation slide with the following text:

- Logos for UN environment programme, National Productivity Council, and Counter MEASURE FOR PLASTIC FREE RIVERS.
- Title: **National Policy Workshop Webinar Series**
- Subtitle: **On Countermeasures for Riverine and Marine Plastic Litter in India**
- Date: **12 -22 May 2020**
- Session 2: **Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address**
- Topic: **Promoting Youth Education and advocacy for mitigating plastic pollution'- Case Study of UNEP Tide Turners Plastic Badge**
- UN environment programme logo at the bottom right.

On the right is a Zoom meeting control panel showing:

- Participant: gayatri raghwa (video on)
- Participants: 325
- Panelist: 18
- Host: NPC INDIA
- Other participants: Oinam Samuel Me, Aakriti Uttam, amit jain, chitra mukherjee, Hareh Thirkral.
- Buttons for mute, video, chat, and Q&A.

The fifth presentation was made by Ms. Gayatri Raghwa, of UNEP's Tide Turner Plastic Challenge. She focused on UN Environment's Clean Seas Campaign to educate young people about plastic pollution and to encourage them to play a part in resolving pressing environmental issues. She explained that this initiative engages youth across the country, seeks to educate young individuals on single use plastics and aims to motivate youth to alter behaviour and norms around plastic usage at both individual and community levels. The target audience of this initiative is from formal as well as non formal education centres and hence includes middle & secondary school students, young college students and scouts & guides.

She detailed out the approach and methodology and emphasised on the process of acquiring knowledge leading to transformation. The importance of gamifying learning and structuring different levels of learning, participant capacity and application into appropriate activities through basic, leadership and Champion levels was especially emphasised. She shared 3-4 stories of tide turners, where actions had been taken at individual and community to combat plastic pollution.



Apart from India, she also talked about this initiative in other African, Asian and Caribbean countries.

She concluded with her recommendations, a few of which are:

- Lack of sound knowledge is a driver at the same time is also the best response mechanism to address most environmental concerns
- Any policy on Single use plastic ban should get the necessary buy in from all the stakeholders, only that can secure its successful implementation
- Integrating emerging issues such as the impact of single use plastic into education curriculum is essential.
- While ensuring a strong component on education and training, one should also ensure resource allocation for it.
- Behavioral change in the community comes with knowledge, skills, attitude and participation .

#### PRESENTATION 6:

**Opportunities and challenges in engaging Faith Based Organizations (FBOs) in abetting riverine pollution by Ms. Subhi Dhupar, Regional Coordinator (United Religions Initiative, North India and Afghanistan)**

The image shows a Zoom webinar interface. On the left, a presentation slide is displayed with the following content:

- Logos for UN environment programme, National Productivity Council, and Counter MEASURE FOR PLASTIC FREE RIVERS.
- Title: **National Policy Workshop Webinar Series**
- Subtitle: **On Countermeasures for Riverine and Marine Plastic Litter in India**
- Date: **12 -22 May 2020**
- Session 2: **Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address**
- Topic: **Opportunities and challenges in engaging Faith Based Organizations (FBOs) in abetting riverine pollution**
- Presenter: **SUBHI DHUPAR**, Regional Coordinator (Uri North India and Afghanistan), [www.uri.org](http://www.uri.org)
- Logos for uri and UNITED RELIGIONS INITIATIVE.

On the right, a Zoom participant list is visible, showing 317 participants. The list includes:

- Panelist 18:
- OS Oinam Samuel Me
- NI NPC INDIA Host
- SD subhi dhupar (Current speaker)
- AU Aakriti Uttam
- AJ amit jain
- CM chitra mukherjee
- GR navatri ranhwa

The sixth presentation has been by Ms. Subhi Dhupar of United Religions Initiative. She introduced United Religions Initiative, as a global grassroots interfaith network and one of the 10 most innovative and successful grassroots initiatives building culture of peace, justice and healing for all human beings and mother earth. It is spread across 109 countries & has over 1000+ member Cooperation Circles (CC) globally with 23 Regional Offices in India.



She emphasized how faith based organization can bring a difference in behavioral change among people as they have massive public following, they are a source of Spiritual values for individual behavior change in devotees, they are lifestyle influencers and drivers of cultural values and agents of advocacy and change. Further, that the faith based organizations inter-connect science and spiritual practices and create potential multiplier effect and mobilize local community. She highlighted the problem of plastic pandemic and the good practices adopted in Gurudwaras, mosques, temples and churches to mitigate plastic pollution. She also discussed about the physical components and governance features and importance of systematic plastic waste management.

She concluded by her recommendations to focus on:

- Education, empowerment and energizing
- Organizing more initiatives and convening of training platforms for FBOs
- Recognizing best practices in the field and supporting to improve efficiency.
- Undertaking survey to identify the knowledge gaps like amount of plastic production and consumption thereby making relevant policies for the same.
- Equipping FBOs with tools and resources for promoting change like declarations, toolbooks, manuals etc. - that nurtures the bond between religion and environmental sector.
- Recognizing the role of interfaith organizations
- Building bridges between communities, creating platforms and resources by linking grassroots experiences with existing policies.

## PRESENTATION 7:

### Single Use Plastic- Seas at Risk by Ms. Priti Mahesh, Toxics Link

The image shows a screenshot of a webinar presentation slide on the left and a video call interface on the right. The presentation slide features the logos of the UN Environment Programme, the National Productivity Council, and Counter Measure for Plastic Free Rivers. The text on the slide reads: "National Policy Workshop Webinar Series On Countermeasures for Riverine and Marine Plastic Litter in India 12 -22 May 2020". Below this, it says "Session 2: Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address SINGLE USE PLASTIC- SEAS AT RISK Understanding consumer perspective". The Toxics Link logo is also present. The video call interface shows a participant named Priti Mahesh and a list of other participants including Oinam Samuel Me, NPC INDIA Host, Aakriti Uttam, amit jain, chitra mukherjee, and navatri ranhwa.

The final presentation of webinar 2 was delivered by Ms. Priti Mahesh, from Toxics Link. She began with highlighting the fact that “In total, half of all plastic produced is designed to be used only once- and then thrown away” and are one of the largest secondary sources of Microplastics in the ocean as they break up very easily under the action of sun and sea water.

She then moved towards presenting the aspects of consumer survey on “Single Use Plastic - Consumer Readiness for Change”. She shared the approach adopted for the survey through a structured questionnaire from target audience of upper middle class and semi structured interviews with Waste Collectors, Waste Segregators, Dealers of Plastic Waste etc. The main components of the survey included:

- Identifying single use plastic
- How often people use single use plastic
- What are the common usage of single use plastic by the stakeholders
- Customer choice with respect to usage of single use plastic;
- Awareness level amongst stakeholders
- Acceptance to ban of single use plastic by Govt.

She went on to highlight the different plastic waste categories which are recyclable or non recyclable, hence ending up at litter spots. The top 3 plastic waste identified which were not picked by any waste recycler were:

- Multi-layered packaging,
- Small plastic pouches used by many industries (FMCG, PCPP, Pharma etc.)
- FMCG packaging of noodles etc.

She concluded on the note that the biggest finding of their survey was that the consumer awareness and support existed to reduce / eliminate use of single use plastics.

## **SALIENT FEATURES OF THE WEBINAR 2**

The session and presentations highlighted the following aspects:

- Features of NPC and UNEP project towards Macroplastics assessment in four cities and key results regarding plastic leakage related estimates, dominant plastics categories identified and aspects on counter measures indicative to combat plastic leakage scenario in the context of field studies undertaken in key hotspots, primary data collected / analysed and secondary data assessed on the waste management situation in the cities of Agra, Haridwar, Prayagraj and Mumbai
- Reflections on how outreach activities were carried out and behavioural change process nudged via addressing knowledge and perception gaps amongst different stakeholders including a mass of youth, tour guides, waste workers, local government and ambassadors of

change with a key focus being Single Use Plastics. The indicative behavior changes being achieved included switching from SUPs to alternatives and reduction of SUPs usage, Plastic Free Taj Mahotsav etc.

- The tools utilized for outreach and behavior change facilitation included pledges, partnerships, hosting workshops and Focus Group Discussions, volunteering work, social media, IEC material etc., along with focus on and exploration of plastics disposal patterns, inclination to change, incentive issues
- The success factors identified include focus on targeted stakeholders, customised campaigns, persuasion and repeated messaging, data supported campaigns, focus on youth and women etc.
- The efforts on outreach also included developing plastic rethink mobile app, development of Braille book, touch and feel kits, online surveys via google forms, face to face interactions, mobile videography, strengthening efforts via Training of Trainers etc., and various activities supported by stakeholder mapping
- Explorations have included the reasons for preference for plastic products such as characteristics of plastics, propensity for reuse of plastic bags, tendency and / or forgetfulness in carrying own bags, acceptability of pricing for carry bags along with goods procured
- The significance of city choices made for the outreach efforts, key factors contributing to marine litter (Behavioural / Infrastructural and systemic). The stakeholder connect also included Faith Based Organisations, boatmen / navik community and more.
- The recommendations include need for continuous capacity building, municipality + CSO led promotion of alternatives etc.
- The UNEP led Tide Turner initiative was also deliberated that systematically engages and motivates youth (middle school, colleges and Scouts and Guides) and utilizes the concept of gamifying learning and raising potential from basic knowledge to leadership to championing levels and related efforts by the participants. Through partnerships, synergy and alignment successes are achieved and stories highlighted and efforts on Tide Turner Plastic Challenge Version 2 and reflections on plastics and connect to Covid 19 highlighted
- Further plastic pandemic was recognized by Faith based organizations along with the ideology of immortality of plastics (resulting either by oversight or the importance and convenience of plastic use due to its characteristics, and focus on business as usual orientation). The importance of FBOs in view of mass following, linkage to spiritual values and a scientific connect, influencing capacity on lifestyles, drivers of cultural values and social inclusion and trust from community etc and being advocates of change highlighted along with various initiatives by FBOs on the subject.
- The exploration of perceptions also highlighted the contextualized massive nature of the problem as indicative by a statement that ‘just a single plastic straw used and disposed amounted to 8 billion on a global scale’. The advantages aside the SUP quantum including in deep seas has grown as a concern and it is highlighted that amongst the top 10 litter items 8 have been plastic products. The insights on recognition of SUPs and its understanding



amongst a range of percentage of stakeholders for various types of SUPs has reflected the gaps as well and need and potential for more outreach work. Further continued usage of plastic bags and plastic products and behavior shifts occurring have been insightfully mapped, along with the indication on recognition of alternatives to plastic carry bags, plastic cutlery, straws etc. Further, the emphasis that PWM Rules need further awareness creation. Indications on plastic varieties collected or littered further emphasise the need for more work to be done in reaching out.

- The recognition of the need to address management of plastics better and valuing the role of plastics has been further emphasized and agreed upon in the panel discussion.

## ENCLOSURES

- **Press Release (s)**
- **Programme Agenda**
- **Session Flyer**
- **Concept Notes**
- **Presentation by each resource speaker**



## PRESS RELEASE

16 MAY 2020

National Productivity Council, under DPIIT, Ministry of Commerce and Industry, Govt. of India is organizing the National Policy Workshop through a series of webinars during 12-22 May 2020 comprising of six on-line sessions as part of the UNEP lead project “Promotion of countermeasures against marine plastic litter in Southeast Asia and India” funded by the Govt. of Japan. Webinar 2 on theme ‘Community Perceptions and behavioural aspects for plastic management and promotion of countermeasures to address (Riverine and Marine) plastic litter’ as part of the National Policy Workshop on Countermeasures for riverine and marine plastic litter has been organized on 14 May 2020 from 14.30 – 17:00 hrs.

The webinar highlighted the following.

(a) Plastic leakage scenarios in four cities Prayagraj, Agra, Haridwar and Mumbai developed by NPC using primary and secondary data and field observations (b) Perception surveys and outreach activities carried out by partner agencies, namely, Chintan in Agra, TERI in Mumbai and Development Alternative in Prayagraj and Haridwar (c) Important stakeholders engaged in outreach activities (d) Success factors as well as Challenges for an effective outreach program (e) The stakeholder connect through Faith-Based Organisations, boatmen/ navik community, and more. (f) The importance of Faith-based Organizations (FBOs) in view of a mass following, linkage to spiritual values and a scientific connect, influencing capacity on lifestyles, drivers of cultural values and social inclusion and trust from community etc and being advocates of change highlighted along with various initiatives by FBOs on the subject. (g) The insights on recognition of Single Use Plastics (SUPs) and its understanding amongst a range of percentage of stakeholders for various types of SUPs have reflected the gaps as well and need and potential for more outreach work. (h) Systematic engagement and motivation of youth (middle school, colleges and Scouts and Guides) and through utilization of the concept of game-based learning, etc which can develop champions/ ambassadors which can lead to mass behavioural change. Also, it is the education regarding plastic pollution science in youth which is considered more important than banning plastic items as better management of plastics will be the result.

The webinar was attended by 450 plus participants representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions. The webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders.

The upcoming webinars are scheduled on 16, 18, 20 and 22 May 2020 and shall be leading to a policy dialogue on the subject. The participants can register for the webinars via <https://www.npcindia.gov.in/NPC/User/unep>

National Productivity Council  
5-6 Institutional Area, Lodi Road,  
New Delhi 110003  
Ph: 24607313





## **WEBINAR 3**

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**ACTIVITIES AND BEST PRACTICES TO COUNTER PLASTICS LITTER BY  
SUSTAINABLE WASTE MANAGEMENT AND CIRCULARITY**





## Concept Note

### WEBINAR 3

**Date: 16<sup>th</sup> May 2020 | 14:30 – 17:00 hrs**

#### Theme:

Activities and Best practices to counter plastics litter by sustainable waste management and circularity.

#### Background:

Plastics have the potential to be better managed at end of life of products and components. To increase material circularity, leakage of plastic from the human technosphere must be reduced, and ultimately prevented. This requires right policy intervention, effective implementation of rules, good depository schemes to enable organized collection of plastic waste, appropriate product design to enable recycling, other novel treatment and disposal options, and alternatives to plastics to be provisioned as part of the scope for sustainability initiatives.

#### Objective:

Issues and challenges of linear plastics economy and exploring prospects for Circular Economy via innovative techno-economic solutions and approaches for redesigning the value chains.

#### The session shall cover the following topics:

- Snapshots of Findings of macroplastic assessment during clean up exercise.
- Collection and channelizing plastic bottle recycling via reverse vending system.
- Grass root waste management enterprise creation in the ecosystem- A case study.
- Case study - Garbage Cafe, a depository scheme for collection of the plastic waste.
- Value Creation from single use plastic waste- Novel initiatives of Indian Oil Corporation Ltd.
- plastics recycling as an important link in achieving circularity.
- Plastic Credit Units, Its benefits, Exchange Ecosystem to be used for sustainability, Dynamic pricing mechanism for fulfilling compliance and its social and financial impact on the industry. and consumer / people behaviour.
- Evolving EPR framework in plastics management.
- Value Creation from single use plastic waste- Novel initiatives of Indian Oil Corporation Ltd.
- Multi Layer plastic management -post consumer disposal.
- Use of Waste Plastic for Bituminous Road.
- FMCG initiatives in plastics circular economy in India.
- Technical specification for Co processing of plastic waste in cement kiln and Constraints faced.
- PWM Rules and their implementation scenario - status and prospects.
- Standardising Recycled Plastic material and products.
- Waste to Energy from Plastics.
- ULB initiatives for promoting plastics circularity.
- Flexible packaging - scope of biodegradation.

#### Expected Outcome:

Recommendations for bringing circularity through sustainable waste management to minimize plastic waste and littering in Indian conditions.



### AGENDA

### Webinar 3

### Activities and Best Practices to Counter Plastics Litter by Sustainable Waste Management and Circularity

16 May 2020 | 14:30 – 17:00 hrs

**Moderator:** Mr. SP Chandak, Former Deputy Director UNEP & Professor Emeritus, BIMTECH

**Coordinator:** Mr. Vijay Kumar Nehra, Assistant Director, NPC

Time (hrs)	Theme/Topic	Speaker
14:30– 14:35	Introduction	Dr. Shukla Pal Maitra, Director, NPC
14:35 – 14:45	Initiatives by UNDP In Promoting Circularity in Plastic Sector	Mr. Prabhjot Sodhi Head (Circular Economy), UNDP
14:45- 14:55	Evolving EPR Framework in Plastics Management	Mr. Ashish Chaturvedi, GIZ
14:55- 15:05	Collection and Channelizing Plastic Bottle Recycling via Reverse Vending System	Mr. Pranjul Jha, Biocruz India Pvt. Ltd.
15:05- 15:15	Plastic Credit Units and Its benefits through Exchange Ecosystem to Achieve Sustainability	Mr. Kunal Sanghavi, Financial Services and Capital Market Expert
15:15– 15:25	Technical Specification for Co-processing of Plastic Waste in Cement Kiln and Constraints Faced	Mr. Varun Dilip Boralkar, Head of Growth & Special Projects, Geocycle India
15:25 – 15:40	Use of Waste Plastic for Bituminous Road Surfacing	Dr. Sangita, Former Head (Flexible Pavement), CRRI & Mr. Sanket Gupta (Director-S K Polymers) Researcher Plastic waste material for road surfacing
15:40 – 15:50	Innovative Systems and Technologies to address Solid Plastic Pollution and Market Creation for Soft Plastic	Mr. Rama Commuri, Renew Oceans
15:50-16:00	Digital EPR System	Mr. Suraj Nandkumar, Recity
16:00- 17:00	Panel Discussion: Recommendations for bringing circularity through sustainable waste management to minimize plastic waste and littering in Indian conditions  Questions & Answers	Additional Panel Members : Ms. Saloni Goel, UNEP Mr. K.D. Bhardwaj, NPC Mr. Amit Jain, Director, IRG System South Asia



**Proceedings**

**National Policy Workshop Webinar Series on  
“Countermeasures for Riverine and Marine Plastic Litter in India”**

**16 May 2020 | 14:30 – 17:00 hrs**



**WEBINAR 3**

**Activities and Best Practices to Counter Plastics Litter by Sustainable Waste Management and Circularity**





## WEBINAR 3

### Proceeding

## Activities and Best Practices to Counter Plastics Litter by Sustainable Waste Management and Circularity

16 May 2020 | 14:30 - 17:30 hrs

#### Moderator

**Mr. SP Chandak,**

*Former Deputy Director, UNEP & Professor Emeritus, BIMTECH*

#### Coordinator

**Mr. Vijay Nehra,**

*Assistant Director, NPC*

### INTRODUCTION

Plastics are widely used material used in textile, rubber automobiles, FMC etc. However if they are not kept in a circular loop that not properly managed at their end of life finds it way to natural environment. Plastics have the potential to be better managed at end of life of products and components. To increase material circularity, leakage of plastic from the human technosphere must be reduced, and ultimately prevented. This requires right policy intervention, effective implementation of rules, good depository schemes to enable organized collection of plastic waste, appropriate product design to enable recycling, other novel treatment and disposal options, and alternatives to plastics to be provisioned as part of the scope for sustainability initiatives. Issues and challenges of linear plastics economy and exploring prospects for Circular Economy via innovative techno-economic solutions and approaches for redesigning the value chains.

### WEBINAR AGENDA 3

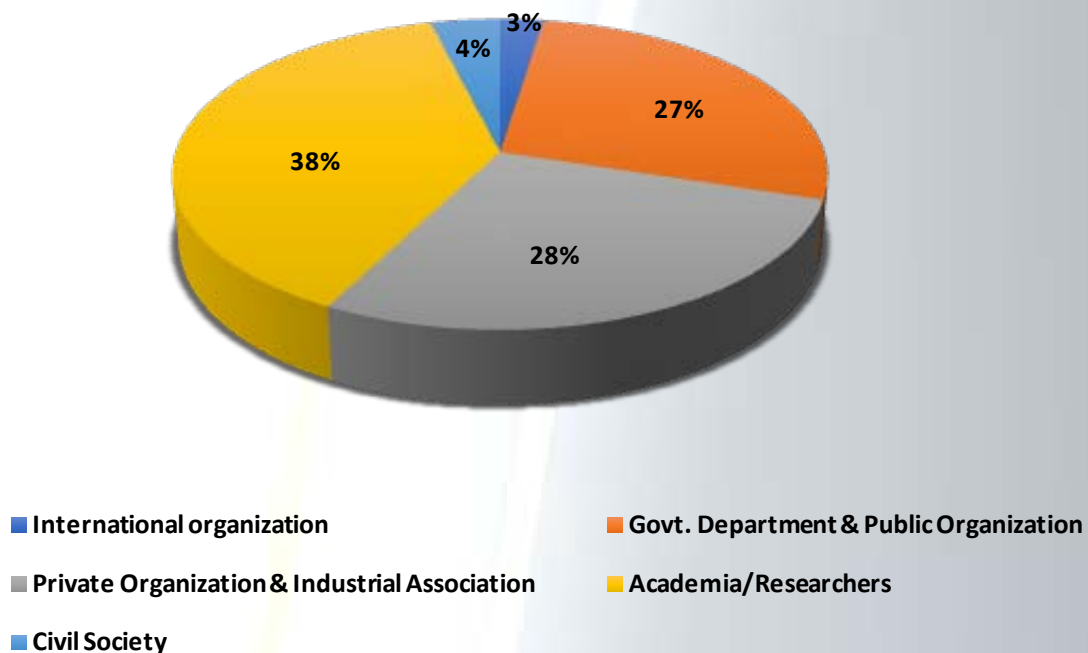
Time (hrs)	Theme/Topic	Speaker
14:30- 14:35	Introduction	Dr. Shukla Pal Maitra, Director, NPC
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14:55- 15:05	Collection and Channelizing Plastic Bottle Recycling via Reverse Vending System	Mr. Pranjul Jha, Biocrux India Pvt. Ltd.
15:05- 15:15	Plastic Credit Units and Its benefits through Exchange Ecosystem to Achieve Sustainability	Mr. Kunal Sanghavi, Financial Services and Capital Market Expert
15:15- 15:25	Technical Specification for Co-processing of Plastic Waste in Cement Kiln and Constraints Faced	Mr. Varun DilipBoralkar, Head of Growth & Special Projects, Geocycle India
15:25 - 15:40	Use of Waste Plastic for Bituminous Road	Dr. Sangita, Former Head

Time (hrs)	Theme /Topic	Speaker
	Surfacing	(Flexible Pavement), CRRI & Mr. Sanket Gupta (Director-S K Polymers) Researcher Plastic waste material for road surfacing
15:40 – 15:50	Innovative Systems and Technologies to address Solid Plastic Pollution and Market Creation for Soft Plastic	Mr. Rama Commuri, Renew Oceans
15:50- 16:00	Digital EPR System	Mr. Suraj Nandkumar, Recity
16:00- 17:00	Panel Discussion: Recommendations for bringing circularity through sustainable waste management to minimize plastic waste and littering in Indian conditions Questions & Answers	Additional Panel Members : Ms. Saloni Goel, UNEP Mr. K.D. Bhardwaj, NPC Mr. Amit Jain, Director, IRG System South Asia

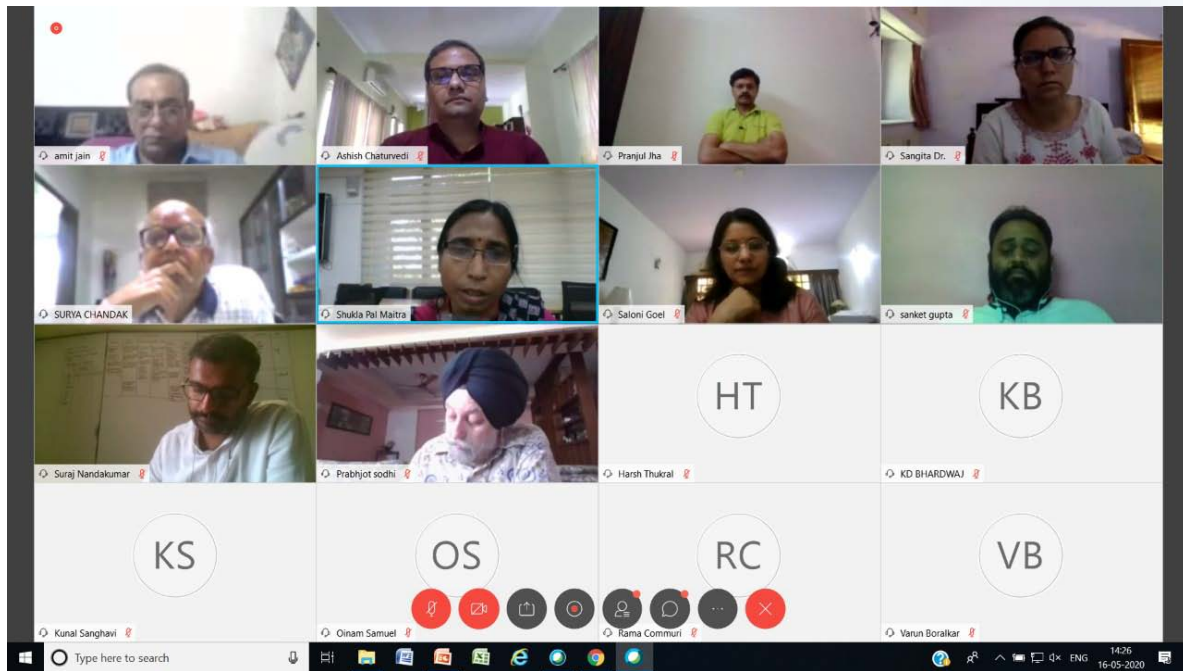
## PARTICIPANT PROFILE

The webinar was attended by 700 plus participants. The participants were from across various sectors (public / private organizations, civil society, academia, and from across a range of national and multilateral institutions such as UN Organisations and the World Bank). The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders. The participant profile details are depicted in **Figure 1**.

**Figure 1: Participant Profile**



## WEBINAR PROCEEDINGS



The session was opened by the Moderator, Mr. SP Chandak, former Deputy Director, UNEP & Professor Emeritus, BIMTECH He welcomed all the resource speakers, panelists and attendees / participants on behalf of NPC and introduced Dr. Shukla Pal Maitra, Director , NPC to introduce the theme of counter measures against marine plastic litter to the participants. Dr. Shukla briefed the participants about the identified counter measures again plastic litter. She quoted several examples and initiatives taken by various companies in India and abroad to minimize on the plastic waste generation. She emphasized on the need of good Plastic Waste Management (PWM), design of product and innovations in management and design to combat plastic pollution.

### PRESENTATION 1:

#### **Initiatives by UNDP in promoting circularity in plastic sector**

The first presentation by Prabhjot Sodhi, Head (Circular Economy), UNDP reflected on the Initiatives by UNDP in promoting circularity in plastic sector. He started with the statistics of plastic waste generation in the country and then went on to discuss the responsibilities of businesses under PWM Rules. He emphasized on creating a responsible environment with a social, institutional and economic construct for the WARRIORS – SAFAI SATHIS especially women

He talked about City Commissioners & UNDP, Private Sector Model covering Socio-technical model, Material Recovery Centres, Institutionalization of Swaccha Kendra, Knowledge management and structure of its implementation

He explained about Circular Economy through Plastic Waste Recycling Management through PRITHVI PWM Partnership and Circular Economy through PRITHVI.

He also presented a case study of a model Swachhta Kendra (Material Recovery Facility), equipped with machineries for better efficiency, provision of all basic amenities and safe working environment of workers and logging of waste flow, data recording and traceability.

He stressed upon mainstreaming of Waste-Pickers by intervening catering to the issues faced by them in occupational as well as personal level

In the end, he suggested Implementation of Extended Producers Responsibility (EPR): With reference to PWM rules, 2016 by bringing clarity among brand owners regarding the implementation of EPR ; promotion of concepts such as buy-back mechanisms and reverse logistics and need of increasing incentives for recyclers to maintain the Circularity of Reuse, Recycle, Reduce, Regenerate

## PRESENTATION 2:

### Evolving EPR Framework in Plastics Management by Mr. Ashish Chaturvedi, GIZ

The screenshot shows a Cisco Webex webinar interface. The main content is a presentation slide titled "Extended Producer Responsibility Evolution". The slide text reads: "EPR is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product. The Extended Producer Responsibility is implemented through administrative, economic and informative instruments. The composition of these instruments determines the precise form of the Extended Producer Responsibility." Below the text is a timeline from 1990 to 2019 with the following milestones: 1990: Thomas Lindqvist introduces idea of EPR on behalf of Lund University to Swedish Ministry of Environment; 1991: First EPR Legislation 'launched in Germany, Popularly known as 'Green Dot'; 2000: 13 more countries in European Union implement EPR legislation; 2011: First EPR rules come to India through E-waste rules; 2016: EPR rule applied to plastics through plastic waste management rules, 2016. Targets not specified for plastics; 2019: EPR framework for plastic waste under preparation in India. The webinar interface includes a top navigation bar, a participant list on the right (425 participants), and a Windows taskbar at the bottom.

The second presentation was by Mr. Ashish Chaturvedi from GIZ. He explained the chronology of EPR evolution across globe. He flagged that the Extended Producer Responsibility is implemented through administrative, economic and informative instruments.

He then discussed about several best practices worldwide for plastic waste management, a few of which were:



**Austria:** The initiative “PfiatdiSackerl” (Goodbye plastic bag) mandates retail sector to charge for plastic bags.

**Italy :**The producers are obliged to pay depending on the type of packaging put onto the market that is used to pay the Municipalities for managing waste.

**United Kingdom:** Tradable Packaging Waste Recovery Note (PRN) system.

**South Korea:** Mandated Rates of Recycling by Item and mandatory submission of Recycling Plan by PRO and Producer to K-eco.

**Japan:** The Container and Packaging Recycling Act mandates sorted disposal by consumers, separate collection by municipalities and recycling of the waste by manufacturers.

In the end he talked about the lessons to be learnt for India, which included:

- Set up a central packaging registry to track packaging used, waste generated, collected, recycled and landfilled (MoEFCC).
- Implement polluters pay principle by including cost of transportation and processing of packaged waste in product prices (MoEFCC and Ministry of Finance)
- Promote business models of MRFs and recycling units based on location specific studies specifying types of plastics available and demand of processed products as raw material (MoHUA and MoEFCC)
- Promote design changes in packaging. e.g. Alternative materials to plastics, shift from polymers to monomers (MoEFCC, DST for research)
- Promote market potential of recycled products (eg.Bottle to Bottle Recycling) by including standards for products in the National EPR Framework (MoEFCC)
- Strengthen value chain of plastics with special focus on strengthening role of the informal sector in collection and operation of MRFs (MoHUA, ULBs, PRIs)

### **PRESENTATION 3:**

**Collection and Channelizing Plastic Bottle Recycling via Reverse Vending System, by Mr. Pranjul Jha, Biocrux India Pvt. Ltd**

The third presentation was delivered by Mr. Pranjul Jha, Biocrux India Pvt. Ltd. He Explained Basic Challenges of Recycling across world.

He started by highlighting the use of plastics in our day to day life and hence how it substantially contributes to the waste generation. He further spoke about the basic Challenges of Recycling across world such as segregation of waste , etc.

He detailed about sustainable PET Recycling Solution and 360 degree Methodology, where PET flakes is converted into resins to make paints, dustbin, toilet seat etc. PET is also recycles to apparels, caps and bags.



He elaborated on the Biocrux – RVMD (Reverse Vending Machine Digital), its features and annual impact

He presented the case study for RVMD (Vaishno Devi Shrine Board) , where more than 80000 bottles were collected and recycled.

He concluded his talk by sharing the challenges faced by RVM industry, some of which were:

- Support from Government
- Policy interventions and execution e.g EPR detailing, Mandate to use recycled material.
- A deposit system like other countries
- Financial: Currently dependence on CSR
- Installation but slow ramp up.
- One machine to take every thing. (Despite MSW 2016 mandate of segregation)
- Habit of waste disposal – Indiscriminate littering.

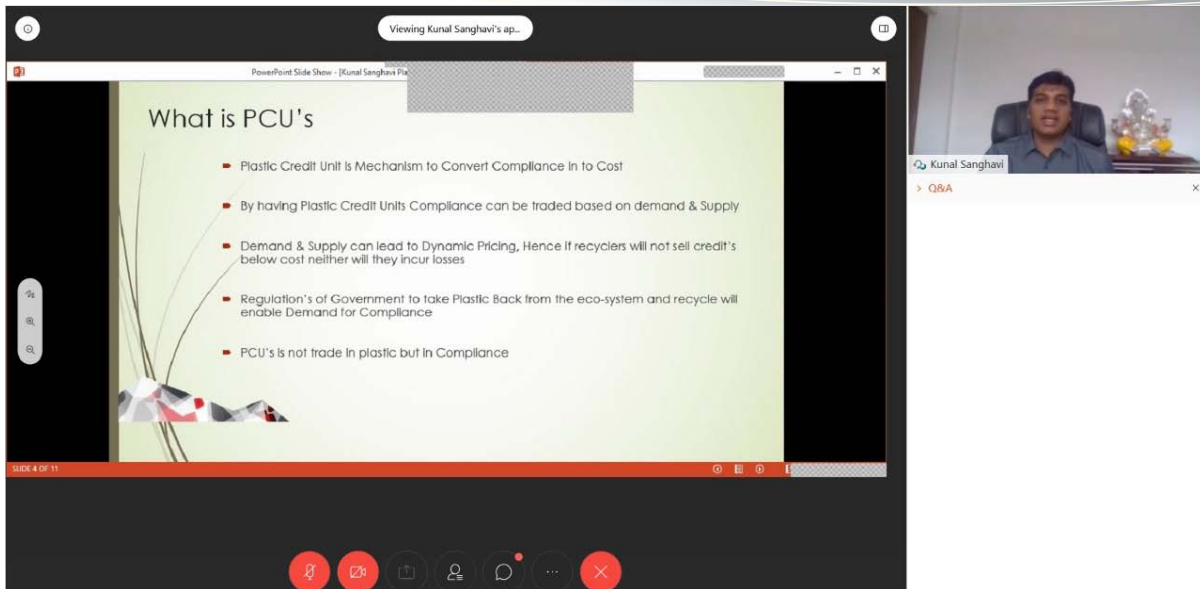
#### **PRESENTATION 4:**

#### **Plastic Credit Units and Its benefits through Exchange Ecosystem to Achieve Sustainability by Mr. Kunal Sanghavi, Financial Services and Capital Market Expert**

The fourth presentation was taken by Mr. Kunal Sanghavi, Financial Services and Capital Market Expert. He explained PCU (plastic credit unit), its role in PW management based on gap in Demand & Supply compliance trading.

He elaborated on the Process for Issuance of PCU's. He discussed about key findings showing cost wise difficulties in managing PW from producer to recycler in value chain while very high awareness & Sensitivity locally & globally to avoid plastic & need to become plastic neutral.

He suggested that there is need for infrastructure, policy level support to make PCU compliance tradeable.

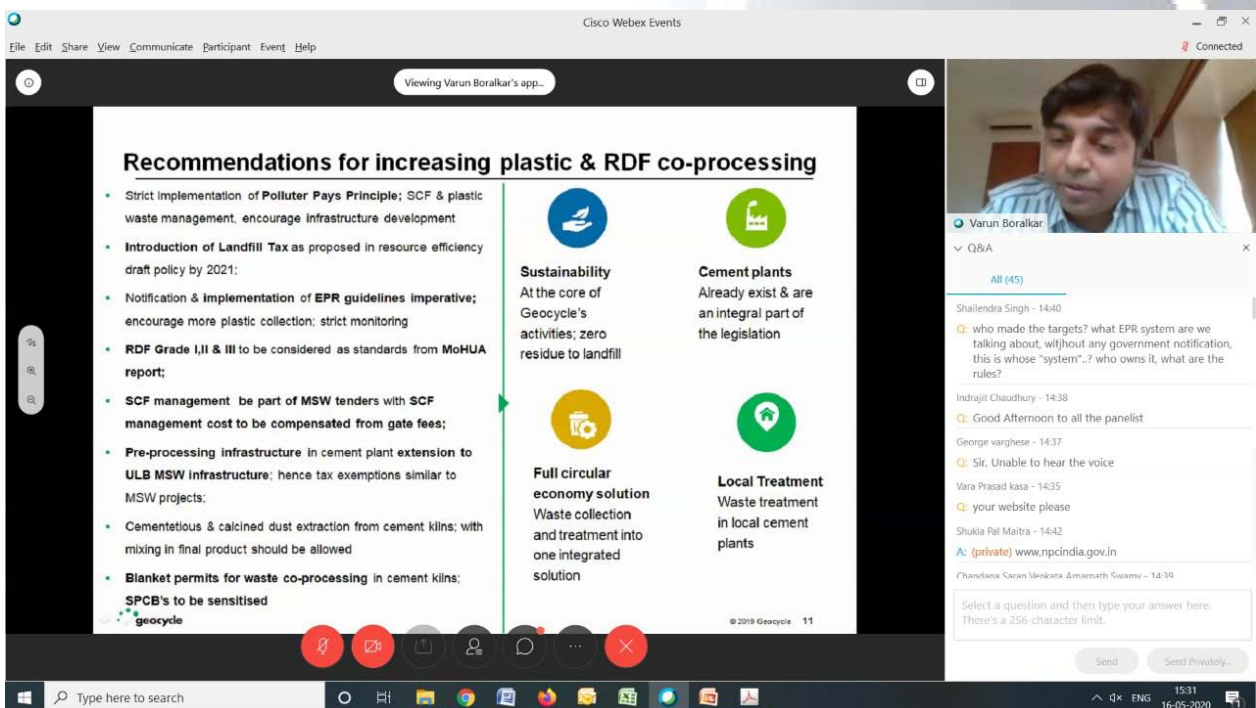


His recommendations included the following:

- Policy makers to allow creation and trade of PCU
- Govt. can themselves develop or participate with allowing entities in enabling the platform for trade of credit units
- Tax and other incentives for corporates, recyclers and individuals complying with the norms.

**PRESENTATION 5:**

**Co-processing: Bringing Circularity to waste managementby Mr. Varun Dilip Boralkar,Head of Growth & Special Projects, Geocycle India**





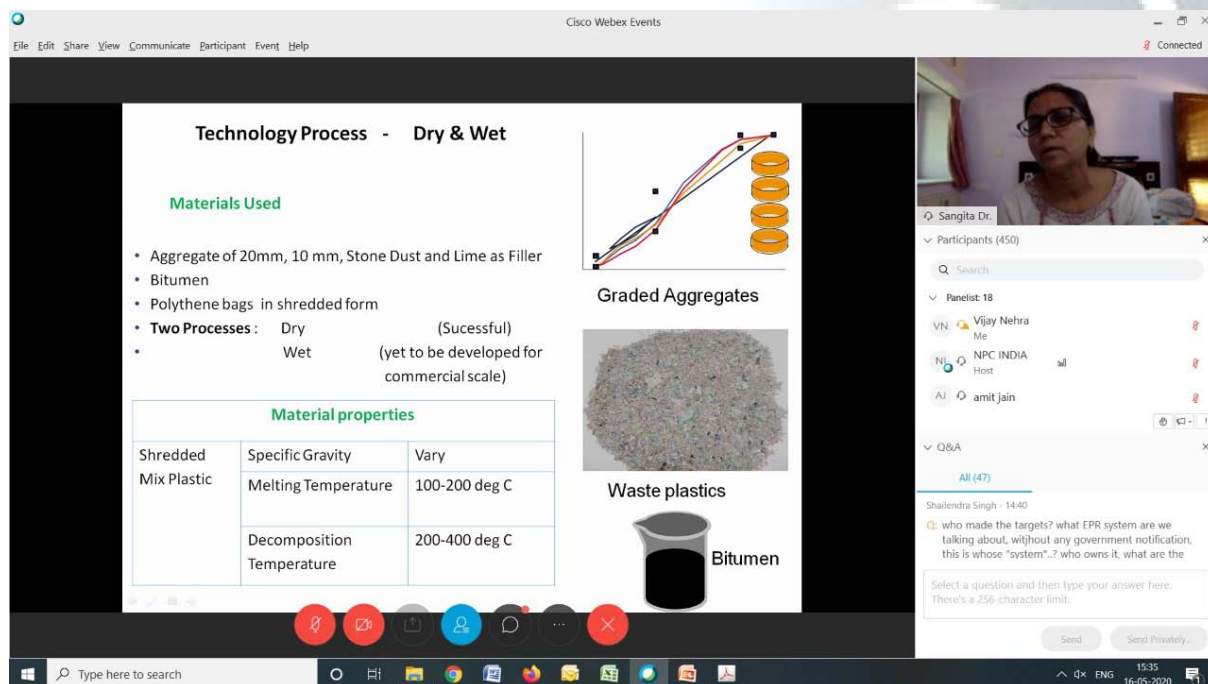
In the fifth presentation, by Mr. Varun Dilip Boralkar, Head of Growth & Special Projects, Geocycle India, he explained need of preprocessing for co processing Plastic Waste

He stressed that legally Co-processing is a preferred technology for the disposal of waste as it leaves no residue and hence facilitates zero landfill option. He showcased a case study of **Development of Bio-mining Projects in Goa, India.**

In the end he concluded with **recommendations for increasing plastic & RDF co-processing** by strictly implementing polluter pays principle, introducing landfill tax, Pre-processing infrastructure in cement plant extension to ULB MSW infrastructure; hence tax exemptions similar to MSW projects.

**PRESENTATION 6:**

**Use of Waste Plastic for Bituminous Road Surfacing by Dr. Sangita, Former Head (Flexible Pavement), CRRI & Mr. Sanket Gupta (Director-S K Polymers) Researcher Plastic waste material for road surfacing**



In the fifth presentation by Dr. Sangita, Former Head (Flexible Pavement), CRRI & Mr. Sanket Gupta (Director-S K Polymers) Researcher, Plastic waste material for road surfacing, the facets of Use of Waste Plastic in Bituminous Road Surfacing were presented.

Dr. Sangita began her talk with the limitation of available options for plastic waste disposal/utilization and the need for the use of waste plastic in Bituminous mixes .

She detailed about two technology processes - Dry and Wet for processing Plastic Waste with bitumen and Optimization of quantity of waste plastic in Bituminous Mixtures. The optimum quantity of waste plastics is 6- 8% by weight of bitumen depending on Type and thickness of Road Surface



She highlighted the case studies of India where plastics were used for city roads, rural roads and national highways.

She then talked about advantages of Using Waste Plastic as Modifier and Binder, like higher resistance to deformation, higher resistance to water induced damages, increased durability and improved fatigue life and improved stability and strength.

She indicated that not all plastics can be used for road construction PVC cannot be used in road construction due high melting point than hot mix temperature.

#### PRESENTATION 7:

### Innovative Systems and Technologies to address Solid Plastic Pollution and Market Creation for Soft Plastic by Mr. Rama Commuri, Renew Oceans



The screenshot shows a Cisco Webex Events window displaying a presentation slide. The slide content includes the following text and logos:

- Logos: UN environment programme, National Productivity Council, Counter MEASURE FOR PLASTIC FREE RIVERS, and renew oceans.
- Text: **National Policy Workshop Webinar Series**  
**On**  
**Countermeasures for Riverine and Marine Plastic Litter in India**  
**12 -22 May 2020**  
**Session 3: Activities and Best practices to counter plastics litter by sustainable waste management and circularity**  
**Innovative systems and technologies to address ocean plastic pollution and market creation for soft plastic**

A video feed of Mr. Rama Commuri is visible on the right side of the screen, and a Q&A chat window is open below it.

In the seventh presentation by Mr. Rama Commuri, Renew Oceans, the Innovative Systems and Technologies to address Solid Plastic Pollution were discussed.

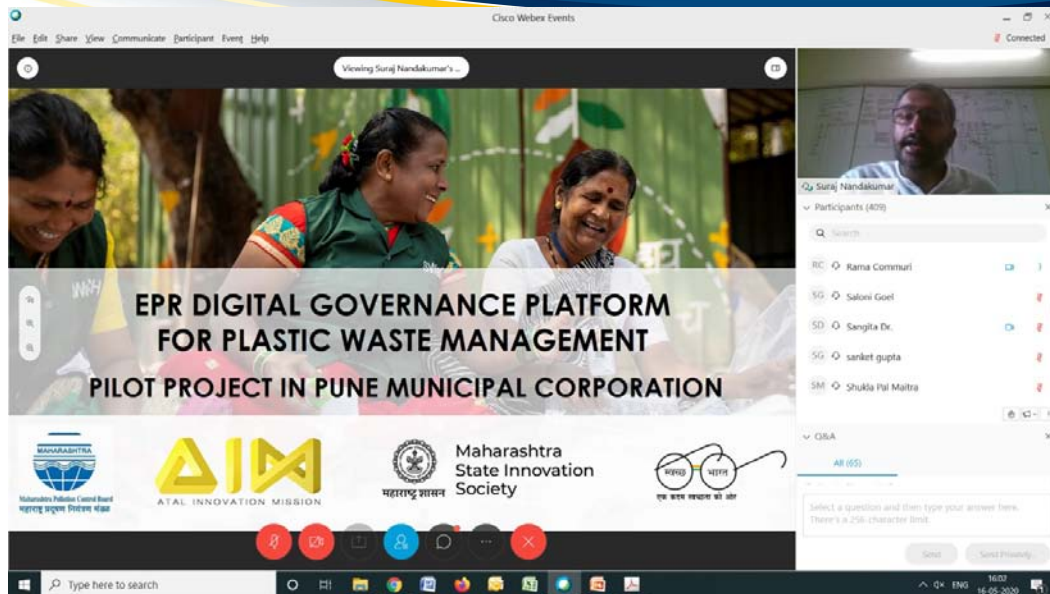
After briefing the audience about their firm, they started with the aspects of data collection carried out by them with detailed mapping of Plastic waste generators, Plastic collectors and types & Quantities of plastic at various zones

He presented a Case study of Varanasi where they have installed pyrolysis plant for conversion of low economic value (soft) plastic in to diesel.

He discussed the infrastructural, behavioral, technological and financial challenges faced by them in meeting their objective.

#### PRESENTATION 8:

### Digital EPR System by Mr. Suraj Nandkumar, Recity



The final presentation of the session was taken up by Mr Nand Kumar on EPR Digital Governance Platform. Mr. Suraj discussed pilot project study of implementation of EPR Digital Governance Platform in Pune. The project focus was towards standardizing and bringing Accountability & Traceability in managing post consumer plastic packaging waste. He highlighted the prime aspects of EPR Governance platform comprising of Central registration portal, Obligation management, Discharging EPR, accountability, Compliance and decision support & analytics.

He elaborated on the practical ground work being undertaken from procurement of low value plastic from waste pickers, process of transfer at sorting & bailing facility to recycler creating a safe disposal certificate. He concluded by highlighting the scaling of this pilot study in 7 other states- Haryana, Himachal Pradesh, Uttrakhand, Maharashtra, Goa, Pondicherry and Karnataka.

### KEY QUESTIONS RAISED BY ATTENDEES / PARTICIPANTS

The session was concluded by answering a series of questions by the speakers and panellists that were put up by several participants in the workshop. The significant questions asked during the Q&A session is as follows:

1. Is there any suggestion to how to minimize the use of plastic in common people in normal lifestyle? and also what we use instead of plastic
2. What is the difference between littered plastic and MSW? Can we say littered plastic if collected from MSW?
3. Is recycling of bottles cost effective too?
4. How do you promote behavioural change in low income groups where sustainable products are not purchased due to either high costs or other inhibitive factors like lack of resources to adopt such practices? Eg A high income group family can shop in bulk for
5. How can quality control system for waste segregation be improved?

6. Is plastic credit in practice yet? what is its acceptance/penetration with Gol?
7. How to collect the used plastic like bottle, plastic cups etc., some body collect in the streets,road sides how to avoid from the diseases in the plastic material and how to confirm from this
8. Bituminous roads is the most environmentally unfriendly process, in terms of heat it uses etc. Why is this called Green technology?
9. How can we make retailers co- effective partners in EPR process because collection from the customer is also essential besides collection from waste dumps
10. Can we use any type of plastic for road constructions?
11. Has there been any concerns of leaching of toxins into ground from these roads?
12. What can be done with the plastic scrap after road life is over and fresh layer has to be added

### **SALIENT FEATURES OF THE WEBINAR 3**

The sessions highlighted the following.

(a) The importance of mainstreaming of Waste-Pickers and to bring Recyclers Incentives to maintain the Circularity of Reuse, Recycle, Reduce & Regenerate initiatives

(b) Collaboration with Municipal Corporations with investments for safety nets, social protection and basic services for Safai Sathis

(c) Strengthening of existing EPR framework and role of informal sector to maintain value chain of plastic

(d) Promote design changes in packaging , shift of alternatives to plastics and promote market potential for recycled products

(c) Focus on reverse vending system where plastic waste such as PET bottles can be converted into PET resins for recycling into various applications such in paints and apparels, Caps & Bags, etc.

(d) Introduce Plastic Credit Unit (PCU) mechanism to covert compliance into Cost. To bring dynamic pricing to benefit of trade system that will encourage more recycling further the consumer & producer will become more sensitive to not to litter plastic. This will upgrade the existing socially responsible system to Auto Sustainable mode.

(e) For increasing plastic & RDF co-processing, it is recommended that Strict Implementation of Polluter Pays Principle is required through Introduction of Landfill Tax. Also recommended that Pre-processing infrastructure in cement plant may be extended to



Municipal Solid Waste management (MSW) infrastructure; hence tax exemptions similar to MSW projects shall be considered.

(f) To encourage use of Plastic waste in Bituminous Road Surfacing to construct all rural roads, city roads and state highways including single-use plastic is a possible solution for today’s plastic pollution. Policy level intervention is required to make use of waste plastic as much as possible in Govt. tenders for road constructions.

(g) It was indicated that the soft plastics such as those having low economic value can be converted to oil.

(h) EPR digital governance platform is required to standardize, and bring accountability & traceability in managing post-consumer plastic packaging waste.

#### **ENCLOSURES:**

- **Press Release (s)**
- **Programme Agenda**
- **Session Flyer**
- **Concept Notes**
- **Presentation by each resource speaker**



## PRESS RELEASE

18 MAY 2020

National Productivity Council, under DPIIT, Ministry of Commerce and Industry, Govt. of India is organizing the National Policy Workshop through series of webinar during 12-22 May 2020 comprising of six on-line sessions as part of the UNEP lead project “Promotion of countermeasures against marine plastic litter in Southeast Asia and India” funded by the Govt. of Japan. The Webinar 3 on theme ‘Activities and Best practices to counter plastics litter by sustainable waste management and circularity’ as part of the National Policy Workshop on Countermeasures for riverine and marine plastic litter has been organised on 16 May, 2020 during 14.30 – 17.00 hrs.

The sessions highlighted the following. (a) The importance of plastics product as well as product packaging redesign towards bringing circularity; (b) Creating a responsible environment with a social, institutional and economic construct for the WARRIORS – SAFALI SATHIS – largely women towards enabling circularity in the plastic products economy; (c) Need to incentivize recyclers to achieve circularity; (d) EPR evolution across globe, prevalent best practices and lessons for India to be learnt regarding Plastic Waste Management; (f) Reverse Vending machine for PET bottles as a solution towards organized segregated waste collection; (g) Issuance of plastic credit units as an economic instrument for plastic recyclers for encouraging collection of segregated plastic waste. (h) Co-processing is a preferred technology for the disposal of plastic waste. (i) Use of low value plastic waste which cannot be recycled, such as polyethylene bags in road construction (j) Plastic to Diesel conversion technology (k) Case study of implementation of Digital EPR Governance platform in Pune as a solution for Plastic Waste Management

The webinar was attended by 700 plus participants as located representing public / private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions. The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders.

The upcoming webinars are scheduled on 18, 20 and 22<sup>nd</sup> May 2020 and shall be leading to a policy dialogue on the subject. The participants can register for the webinars via <https://www.npcindia.gov.in/NPC/User/unep>

National Productivity Council  
5-6 Institutional Area, Lodi Road,  
New Delhi 110003  
Ph: 24607313



## **WEBINAR 4**

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**ASSESSMENT OF PLASTIC POLLUTION IMPACT ON NATURAL CAPITAL  
AND RIVERINE AND MARINE ECOSYSTEMS NEEDING POLICY  
INTERVENTION**







## Concept Note

### WEBINAR 4

Date: 18<sup>th</sup> May 2020 | 14:30 – 17:30 hrs

#### Theme:

Assessment of plastic pollution impact on natural capital and riverine and marine ecosystems needing policy intervention

#### Background:

Impacts of plastics on flora, fauna and humanity have been observed by researchers. Plastic debris in the environment soaks up hazardous pollutants, transports them through the ecosystem and transfers the compounds to organisms that consume the plastic particles, potentially producing adverse health effects, and also causing plastics and associated chemicals to reach higher trophic levels into food chains. To fairly evaluate the impacts of plastics within a comprehensive ecological and economic and environmental framework and to address trade-offs, life cycle methodologies will need to be bolstered by standardized and widely-accepted plastic leakage assessment and accounting.

#### Objective:

To understand mismanaged plastics in the environment ideology (Macro and Micro plastic), Valuing eco - system services and bio - diversity and implications from waste plastic litter, and river economics and impact of plastics on the eco - system and food chain and Life Cycle aspects.

#### The session shall cover the following topics:

- Snapshots of Findings of Microplastic assessment in Ganga and Yamuna
- "The Lost Plastic and it's Consequences"
- Ecological Economics of Plastics and Fiscal and Behavioural Policy Instruments
- Macro and Micro plastic in Indian Marine environment – concerns regarding food chain and Impact evaluation Methodology
- Addressing mission clean Ganga - Technical elements
- River economics and impact of Plastics on the eco system and food chain
- Valuing eco system services and bio diversity and implications from waste litter
- Sustainable Development Goals and indicators monitoring to cover plastic impact
- Natural capital implications from plastic pollution impacts - Assessment Methodology and results
- Life cycle analysis of plastic products in the value chain

#### Expected Outcome:

Improved understanding of economic implications including econometric tools for assessment of impact of plastic waste on riverine and marine ecosystem, in Indian context and recommendations for developing regulatory & market based instruments for preserving riverine and marine ecosystems.



## AGENDA

## Webinar 4

### Assessment of Plastic Pollution Impact on Natural Capital and Riverine and Marine Ecosystems needing Policy Intervention

18 May 2020 | 14:30 – 17:00 hrs

**Moderator:** Mr. SP Chandak, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH

**Coordinator:** Mr. Oinam Samuel, Deputy Director, NPC

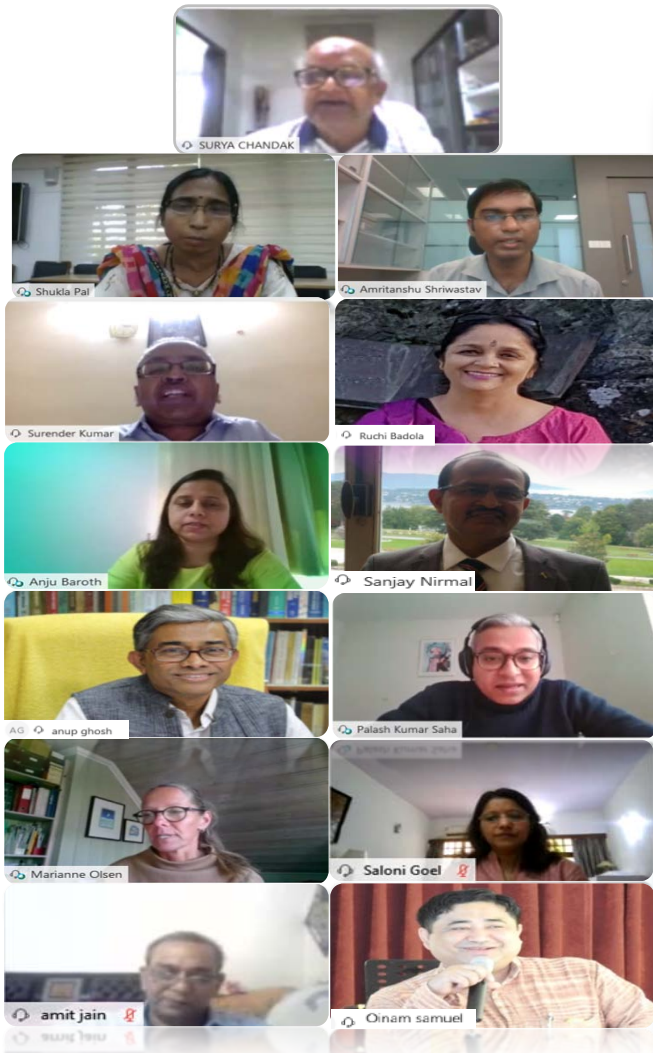
Time (hrs)	Theme/Topic	Speaker
14:30 – 14:45	Snapshots of Findings of Micro-plastic Assessment in Ganga and Yamuna Rivers	Dr. Shukla Pal Maitra, Director, NPC
14:45 – 15:00	The Lost Plastic and it's Consequences	Dr. Amritanshu Shrivastav, Asstt. Professor, ESED, IIT-Bombay
15:00- 15:15	Ecological Economics of Plastics and Fiscal and Behavioural Policy Instruments	Dr. Surender Kumar, Professor, Delhi School of Economics
15:15 – 15:30	Valuing Ecosystem Services and Bio-Diversity and implications from Waste Litter	Dr. Ruchi Badola, Sr. Scientist, Wildlife Institute of India
15:30 – 15:45	Sampling and Analysis challenges in microplastic studies”	Dr. Anju Baroth, Scientist, Habitat Ecology Department Wildlife Institute of India
15:45 – 16:00	Use of Waste Plastic in Road Construction and its Future Impacts	Mr. S.K. Nirmal, Secretary General, Indian Road Congress
16:00 – 16:15	Life Cycle Analysis of Plastic Products in the Plastic Value Chain	Prof. A K Ghosh, IIT Delhi
16:15 - 16:30	Ocean Plastic Turned into an Opportunity in Circular Economy-OPTOCE-Project Details	Mr. Palash Kumar Saha, Research Scientist, SINTEF Community, Norway, Norway
16:30 - 16:45	Insights of the Project India-Norway Capacity Building Project on Plastic and Chemical Pollution in India (INOPOL)	Dr. Marianne Olsen, Research Manager Environmental Contaminants, Norwegian Institute for Water Research
16:45 – 17:00	Panel Discussion: Standardisation of Impact Assessment Studies of Plastic Waste on Riverine and Marine System  Questions and Answers	Additional Panel Members: Ms. Saloni Goel, UNEP Mr. Amit Jain, IRG System South Asia Mr. K D Bhardwaj, NPC,



**Proceedings**

**National Policy Workshop Webinar Series on  
“Countermeasures for Riverine and Marine Plastic Litter in India”**

**18 May 2020 | 14:30 – 17:00 hrs**



**WEBINAR 4**

**Assessment of Plastic Pollution Impact on  
Natural Capital and Riverine and Marine  
Ecosystems needing Policy Intervention**



## WEBINAR 4

### Proceeding

## Assessment of Plastic Pollution Impact on Natural Capital and Riverine and Marine Ecosystems needing Policy Intervention

18 May 2020 | 14:30 - 17:30 hrs

#### Moderator

**Mr. SP Chandak,**

*Former Deputy Director, UNEP & Professor Emeritus, BIMTECH*

#### Coordinator

**Mr. Oinam Samuel,**

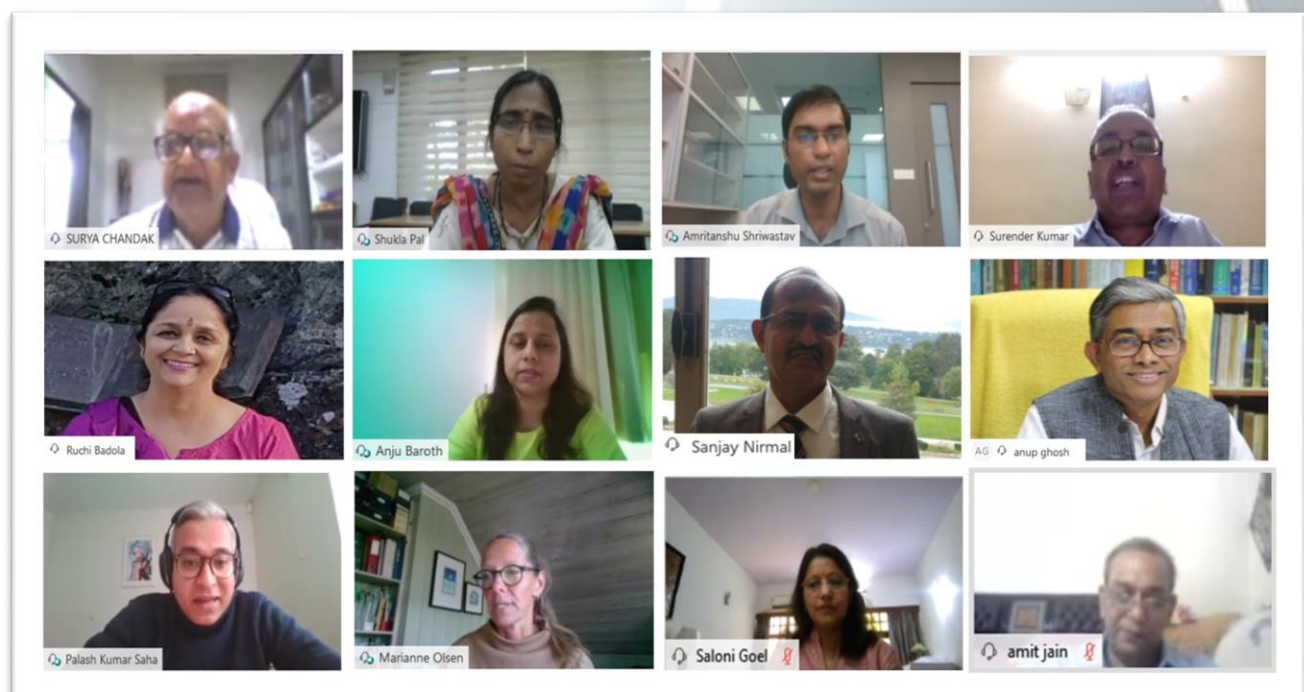
*Deputy Director, NPC*

### INTRODUCTION

Impacts of plastics on flora, fauna and humanity have been observed by researchers. Plastic debris in the environment soaks up hazardous pollutants, transports them through the ecosystem and transfers the compounds to organisms that consume the plastic particles, potentially producing adverse health effects, and also causing plastics and associated chemicals to reach higher trophic levels into food chains. To fairly evaluate the impacts of plastics within a comprehensive ecological and economic and environmental framework and to address trade-offs, life cycle methodologies will need to be bolstered by standardized and widely-accepted plastic leakage assessment and accounting.

The objective is to understand mismanaged plastics in the environment (Macro and Micro plastic), Valuing eco - system services and bio - diversity and implications from waste plastic litter, and impact of plastics on the eco - system and food chain and Life Cycle aspects.

### WEBINAR 4 AGENDA

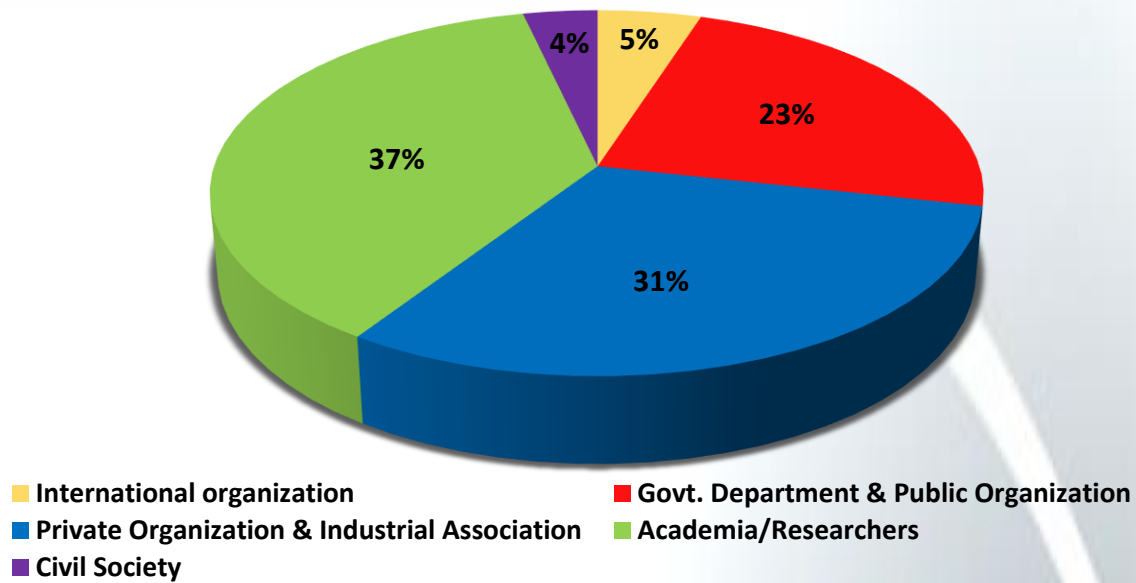


Time (hrs)	Theme/Topic	Speaker
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15:00- 15:15	Ecological Economics of Plastics and Fiscal and Behavioural Policy Instruments	Dr. Surender Kumar, Professor, Delhi School of Economics
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## PARTICIPANT PROFILE

The webinar was attended by 600 plus participants as located across 10 countries such as Denmark, Japan, Malaysia, Netherland, Norway, Oman, Philippines, Sri Lanka, United Kingdom, United States of America etc. The participants were from across various sectors (public / private organizations, civil society, academia, and from across a range of national and multilateral institutions such as UN Organisations, GIZ, WWF, ZSL, World Bank, JICA, SACEP etc). The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders. The participant profile details are depicted in **Figure 1**.

Figure 1: Participant Profile



Sl. No.	Countries Attended
1	Denmark
2	India
3	Japan
4	Malaysia
5	Netherlands
6	Norway
7	Oman
8	Philippines
9	Sri Lanka
10	United Kingdom
11	United States of America

**Total Attendance**  
643

**WEBINAR PROCEEDINGS**

The session was opened by the coordinator Mr. Oinam Samuel, Deputy Director, NPC, by welcoming the moderator, all the resource speakers, panelists and attendees / participants on behalf of NPC and UNEP.

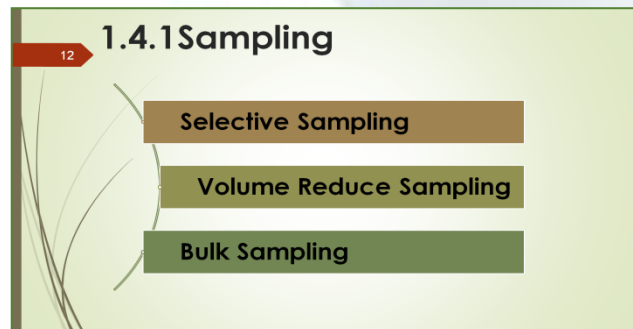
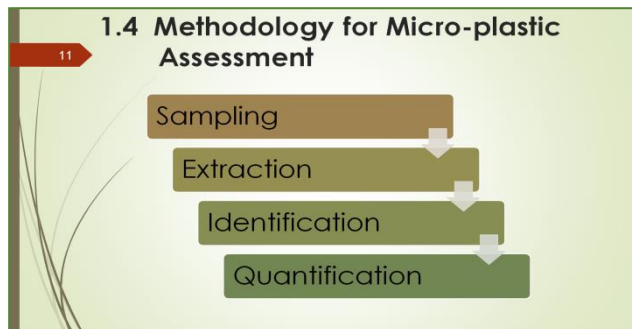
Mr. SP Chandak thanked the organizers and appreciated the idea of the virtual workshop, and briefed to resource speakers to optimise time to draw maximum attention to the core and significant aspects and important case examples. He also appealed to reflect on the key recommendations that could guide a direction for policy makers.



## PRESENTATION 1:

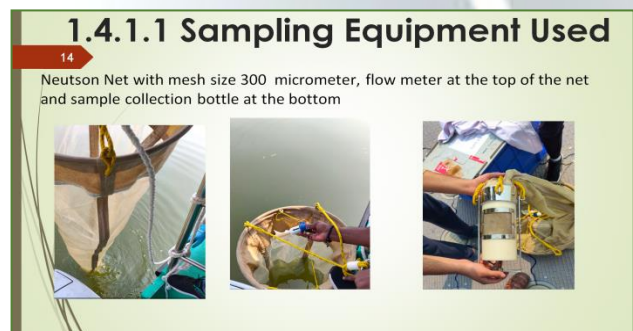
### Snapshots of Findings of Micro-plastic Assessment in Ganga and Yamuna Rivers by Dr. Shukla Pal Maitra, Director, NPC

The first presentation by Dr. Shukla Pal Maitra, Director, NPC reflected on the findings of micro-plastic assessment in Ganga and Yamuna Rivers and methodology which was adopted during the micro-plastic assessment.



**13** **1.4.1.2 Key parameters**

<b>Tow Duration</b>	10 to 30 minutes
<b>Tow Distance</b>	500 meter
<b>Vessel Speed</b>	~1 to 3 Nautical
<b>Sweep area and filtered water volume</b>	~500 ml
<b>Tow Position</b>	Sampling net was towed at one side of the vessel with less influence from its turbulence.
<b>Net Immersion depth</b>	about 1/2 to 3/4 of the height of the net's mouth.
<b>Meta Data recorded</b>	Time of day and date, latitude, longitude, initial and final flowmeter reading



She described how sampling, extraction, identification, quantification steps and equipment were used during micro-plastic assessment in Ganga & Yamuna Rivers and how microplastic results have been correlated with types of plastic waste/products assessed during clean up /perception studies. She further highlighted the major findings from perception surveys in Prayagraj & Agra that varieties of polymer were observed in water and another source of microplastic was wastewater both domestic as well as industrial which is drained into the river. She emphasised that microplastic survey also needs to be undertaken in wastewater falling into river. Microplastic survey results can be a very good source of information in developing plastic leakage scenario. The analytical data will also be helpful to develop the risk assessment and mitigation strategies.

She concluded her presentation with the need for attention to the following:

- Microplastic sampling indicated presence of polymers that are likely present in food packaging and Tobacco, Pan Masala sachet (EVOH, PVAL, PE, PP, PVC, PET), thermo packaging material (Polyamide), disposable cups and plates (polystyrene, styrene) thin polybags and plastic bags (LDPE, HDPE).
- Microplastic analysis validates our primary studies and macro assessment studies in Prayagraj and Agra.
- There is a requirement to make a comprehensive microplastic monitoring plan in water, sediments, fishes and other aquatic plants to understand its impact.

- Microplastic survey has to be validated through macroplastic assessment studies leading to identifying the polymers in macroplastic being leaked into the natural environment
- This study has to be undertaken in other major rivers and river banks and river beds along the major plastic waste generating cities in the country

## PRESENTATION 2:

### The Lost Plastic and it's Consequences by Dr. Amritanshu Shriwastav, Asstt. Professor, ESED, IIT-Bombay



These second presentation was undertaken by Dr. Amritanshu Shriwastav, Asstt. Professor, ESED, IIT-Bombay. Dr. Amritanshu gave insights on the loss of plastics and its consequences on terrestrial and marine lives. He explained about global plastic value chain and estimated losses to the environment and this lost plastic has entered into eco system. The presence of microplastics in different environmental matrices was indicated however he reflected that data availability about human exposure and ingestion of microplastics and direct evidence of health effects on humans is still not available in detail.

He indicated that direct evidences are available for their health effects on different organisms and further informed about how vitro studies suggest cytotoxicity to humans. Considering adverse impacts on living organisms, he highlighted the need to minimize the loss of plastic and thus its environmental burden.

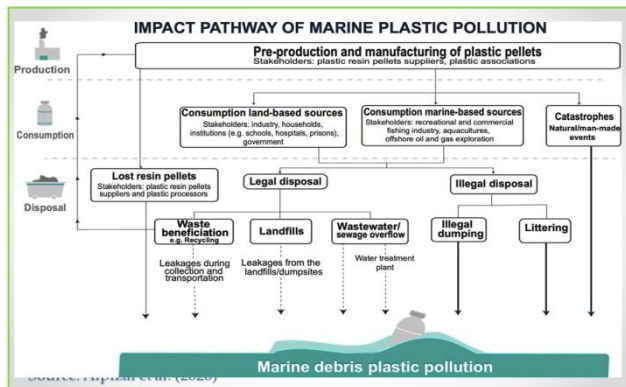
Finally he gave a few key recommendations pertaining to

- Need to minimize the loss of plastic and thus its environmental burden.
- More in-depth understanding is needed for the fate of the lost plastic and the associated consequences on economics, ecology, and human health.
- A more comprehensive human exposure assessment is needed.
- There is a need to establish health related hazards due to plastic/microplastics on human health with rigorous studies.
- More studies are required to perform a comprehensive risk assessment for better management of the associated concerns.



### PRESENTATION 3:

#### Ecological Economics of Plastics and Fiscal and Behavioural Policy Instruments by Dr. Surender Kumar, Professor, Delhi School of Economics



The third presentation was delivered by Dr. Surender Kumar, Professor, Delhi School of Economics. He began with the consumption and generation of plastic waste in India as well as global, and how plastic waste contributes to the total solid waste. He highlighted the collection efficiency of plastic waste and how it was treated. Scale of plastic problem in India and particularly how marine plastics pollution has reached at its crisis levels.

He further explained the impact pathway of marine plastic pollution and setting of policy goals to solve the problem. He also spoke about matrix of price based, rights based, regulation and behavioral instruments over targeting plastic industry, consumption by household & firms and disposal. He elaborated a case study on reducing plastic bag use with emphasis on econometric analysis.

He concluded by giving the following remarks:

- Plastic waste in general and MPP is a serious concern in India, and land based consumption of plastic is a major source of MPP
- Effective solutions require reduction in real consumption and treatment/recycling of waste
- Economic cost of implementation and socio-cultural, environmental, and the factors that affect behavioral changes determine the effectiveness of mitigation strategies
- A combination of policy instruments is more effective rather than a single instrument, i.e., policies such as deposit-refund scheme combined with behavioral instruments

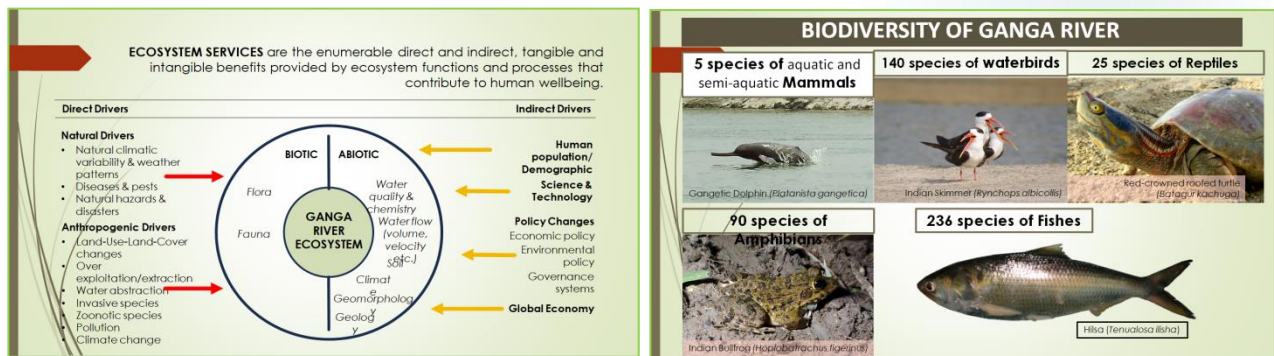
### PRESENTATION 4:

#### Valuing Ecosystem Services and Bio-Diversity and implications from Waste Litter by Dr. Ruchi Badola, Sr. Scientist, Wildlife Institute of India

The fourth presentation was delivered by Dr. Ruchi Badola, Sr. Scientist, Wildlife Institute of India. She began with the direct and indirect, tangible and intangible benefits provided by ecosystem functions and processes that contribute to human wellbeing. She elaborated the



biodiversity profile of Ganga River of various species of aquatic and semi-aquatic mammals, waterbirds, reptiles, amphibians and fishes.



She explained about the ecosystem services provided by riverine ecosystems reflecting the variations in geology, geomorphology, soil type, climate, flora and fauna, and social and economic issues. She also narrated about various impacts such as physical impact on biodiversity, chemical impact, economic impact and health impact.

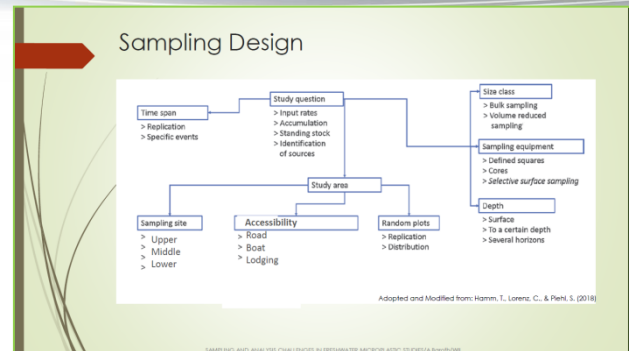
She concluded her presentation by suggesting following ways forward:

- Understand plastic waste generation at community level.
- Demand and supply of plastic waste, circular economy.
- Engage communities, mass awareness, social movements (Ganga Praharis).
- Financial and policy interventions: Local governments cover 50% of investment costs for waste systems, rest from national government subsidies and private sector.
- For macroplastics entering into sea, NMCG is setting surface and submerged trash scrapers.
- For microplastics, natural solutions such as strengthening mangrove forests of Sundarbans.
- Trans-border cooperation between India and Bangladesh.
- Working closely with GoI programs: Financing solid waste management was indicatively a challenge, more for operational costs than for capital investments.
- Cost recovery for waste services differs across income levels, full cost recovery largely limited to high-income countries.

**PRESENTATION 5:**

**Sampling and Analysis Challenges in Microplastic Studies by Dr. Anju Baroth, Scientist, Habitat Ecology Department, Wildlife Institute of India**

The fifth session was taken up by Dr. Anju Baroth, Scientist, Habitat Ecology Department, Wildlife Institute of India. She explained about the challenges in freshwater microplastic (MP) studies like sampling design, equipment, contamination issues, sample processing, well equipped lab, instrumentation facility, trained manpower, time & funds etc.



- ### Field Sampling
1. Site Selection
    - Representative considering natural and anthropogenic factor variance
    - Spatial Coverage
    - Temporal Coverage
    - Replicates
  2. Natural Factors
    - Contamination
    - Weather Conditions
    - Flow and Current
  3. Other Factors
    - Accessibility
    - Logistics Support
    - Local Community Support
    - Boarding and Lodging for team
    - Safety of team members
    - Safety of equipment
- SAMPLING AND ANALYSIS CHALLENGES IN FRESHWATER MICROPLASTIC STUDIES (Bhargava)

- ### Equipment
- #### 1. Water
- For freshwater sampling large Manta trawls and Neuston nets cannot be used
  - Depth and flow profile variability of river makes it difficult to use trawls
  - Depending on physical characteristics of the river, the sampling equipment should be decided
  - Initial hit & trial with recommended and local solutions need to be worked out
- SAMPLING AND ANALYSIS CHALLENGES IN FRESHWATER MICROPLASTIC STUDIES (Bhargava)

She presented sampling equipment along with their description, pros and cons which can help in selecting appropriate sampling equipment as per the requirement of study and site. She outlined the steps in microplastic analysis with cost of instrumentation involved. She also listed gaps of importance and rationale behind the same to address sampling and analysis plan.

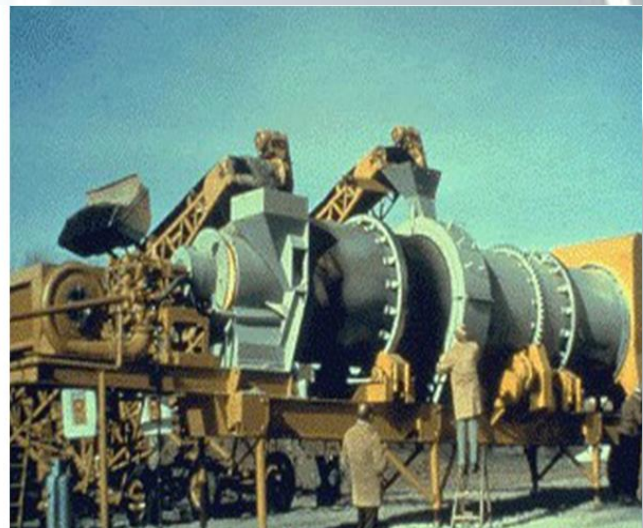
She suggested standard protocol for freshwater microplastic (MP) sampling and analysis, guidelines involving community, collaborations and exchange of knowledge.

## PRESENTATION 6:

### Use of Waste Plastic in Road Construction and its Future Impacts by Mr. S.K. Nirmal, Secretary General, Indian Road Congress



**Shredding Machine**



**Central Mixing Plant**



The sixth presentation was given by Mr. S.K. Nirmal, Secretary General, Indian Road Congress. He delved on waste plastic sources and advantages of using waste plastic as modifier in binder. Advantages are higher resistance to deformation, higher resistance to water induced damages, increased durability and improved fatigue life, improved stability and strength, environment friendly solution etc. He addressed the issue of disposal of waste plastic, thereby making the use of plastic environment friendly.

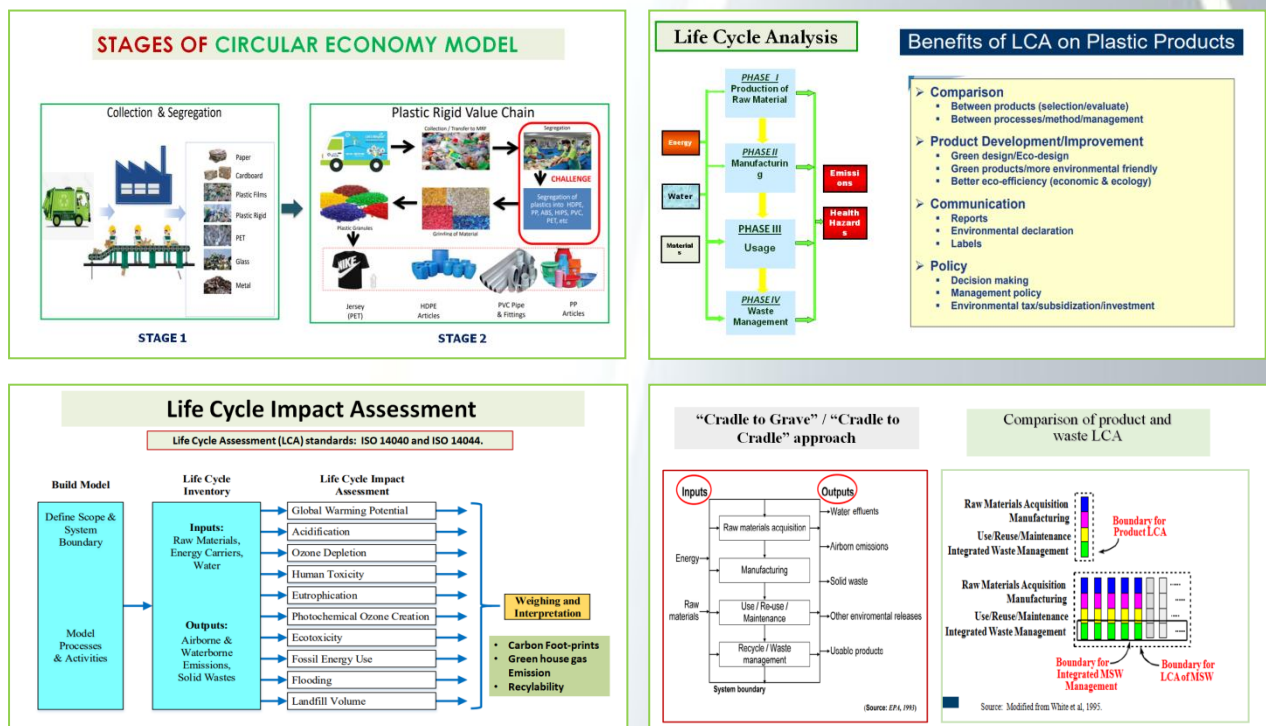
He highlighted the Indian Roads Congress guidelines for the use of waste plastic in hot bituminous mixes (dry process) in wearing courses (IRC:SP:98-2013). He shared about the waste plastic applications in road construction and initiatives taken up by the Ministry of Road Transport & Highways, Govt of India

He emphasised the concerns with use of waste plastic and its toxicity and inherent properties of chemical additives which may cause environmental issues. Heating plastics may sometimes release moderate to highly toxic emissions which may cause health and safety concerns. Micro plastics flushed down into rivers, lakes and seas could pose a major threat to marine life. He concluded his presentation by suggesting that in future reuse of waste plastic modified bituminous mix should consider.

**PRESENTATION 7:**

**Life Cycle Analysis of Plastic Products in the Plastic Value Chain by Prof. A K Ghosh, IIT Delhi**

The seventh presentation of the session was delivered by Prof. A K Ghosh, IIT Delhi. He elaborated on the life cycle analysis to preserve the value of plastics and to efficiently design the products for best possible post consumers usage.





He emphasized on the circular-economy solutions to expand the scope of recycling methods, across the plastics value chain, minimization of leakage of plastic waste and least preference to disposal in landfills. Need of plastic recycling, benefits of LCA on plastic products, life cycle impact assessment, “cradle to grave” / “cradle to cradle” approach. He also explained the importance of materials, energy and emissions during manufacturing of product, usage and disposal stages in LCA.

He further highlighted the importance of minimizing waste and maximizing value through circular economy approach. Prof. A K Ghosh concluded his presentation by indicating the need for clear definition/understanding of the recyclables for the plastics products based on the carbon foot prints, ease of recycling, economics and life cycle analysis for policy decision and emphasized the following:

- Defining recyclability
- Establishing recyclable hierarchy
- Effect on recyclability due to presence of other similar or non-similar materials
- Materials reduction (in terms of thickness) vs. collection/recyclability from waste
- Synthetic vs. biodegradable nature of materials
- Single use plastics (very widely used in the present pandemic situation)

#### **PRESENTATION 8:**

**Ocean Plastic Turned into an Opportunity in Circular Economy-OPTOCE-Project Details by Mr. Palash Kumar Saha, Research Scientist, SINTEF Community, Norway**

The eighth presentation of the session was given by Mr. Palash Kumar Saha, Research Scientist, SINTEF Community, Norway. He informed about the Ocean Plastic Turned into an Opportunity in Circular Economy – OPTOCE project from Norwegian Foundation for Scientific and Industrial Research, SINTEF. The project OPTOCE aims to investigate and document how the involvement of energy intensive industries can increase the treatment capacity for Non-Recyclable Plastic Wastes and thereby contribute to reduce the release of plastics to the Sea.

He explained how integrated waste management, co-processing of wastes in energy-intensive industry can help in improving waste treatment, resource efficiency and emission reduction. He also shared on the lessons learned from the pilot demonstrations in each country. And importance of learning to be shared through a regional multi-stakeholder forum to raise awareness, capacity building and replication through an international conference.

#### **PRESENTATION 9:**

**Insights of the Project India-Norway Capacity Building Project on Plastic and Chemical Pollution in India (INOPOL) by Dr. Marianne Olsen, Research Manager Environmental Contaminants, Norwegian Institute for Water Research**



India-Norway Marine Pollution Initiative

India-Norway cooperation project on capacity building for reducing plastic and chemical pollution in India (INOPOL)

Marianne Olsen

National Policy Workshop Webinar Series on  
“Countermeasures for Riverine and Marine Plastic Litter in India”, 18 May 2020



5/18/2020 Marianne Olsen 1



Background

2019: MoU signed on India-Norway Ocean Dialogue and the establishment of the Norway/India Task force on blue economy and sustainable development



↓

Indo-Norway Marine Pollution Initiative

- the first Joint initiative
- takes forward the commitments made under the MoU

The project is financed by The Norwegian Development Program to Combat Marine Litter and Microplastics

5/18/2020 Marianne Olsen 2

The final presentation of the session was delivered by Dr. Marianne Olsen, Research Manager Environmental Contaminants, Norwegian Institute for Water Research. She briefed about the India-Norway cooperation project on capacity building for reducing plastic and chemical pollution in India (INOPOL). The objective of the project is applying a science-based approach to build knowledge and capacity to tackle plastic and chemical pollution from key sources. The focus is on developing coherent systems for data collection and analysis. The project is to build capacity and awareness of different stakeholders involved. She concluded by sharing the project deliverables.

#### SALIENT FEATURES OF THE WEBINAR 4

The session and presentations highlighted the following aspects:

- Methodology of microplastic assessment comprising sampling, extraction, identification and quantification steps and the results of microplastic from samples collected from Ganga and Yamuna rivers in Allahabad and Yamuna River in Agra.
- How microplastic results have been correlated with types of plastic waste/products assessed during clean up /perception studies.
- Few of the polymers couldn't be correlated with the source of plastic product/waste stream, and in an area of further research.
- The presence of polymers EVOH, PVAL, PE,PP,PVC, PET amongst microplastics in river was indicative which are likely to be present in food packaging and Tobacco, Pan Masala sachet, Polyamide in thermo packaging material, polystyrene, styrene in disposable cups and plates thin poly bags and LDPE, HDPE in plastic bags etc as sources causing contamination.
- Microplastic analysis validates primary studies and macro assessment studies in Prayagraj and Agra.
- The presence of microplastic in different environmental matrices aside, enough data availability about human exposure and ingestion of microplastics and direct evidence of health effects on humans is still not available
- Adverse impacts on living organisms highlighted the need to minimize the loss of plastic and thus its environmental burden.
- More in-depth understanding is needed for the fate of the lost plastic and the associated consequences on economics, ecology, and human health.

- Need of more research on health aspects of living organism and on associated risk assessment.
- Impact pathway of marine plastic pollution and setting up policy goals to solve the problem.
- Matrix of price based, rights based, regulation and behavioral instruments over targeting plastic industry, consumption by household & firms and disposal.
- Direct and indirect, tangible and intangible benefits provided by ecosystem functions and processes that contribute to human well-being
- Trade off between plastic benefits and negative effects to human and environment due to use of plastic
- Engage communities, and undertake mass awareness, social movements (Ganga Praharis). Further financial and policy interventions needed, focus on natural solutions such as strengthening mangrove forests of sundarbans, trans-border cooperation.
- Pros and cons which can help in selecting appropriate sampling equipment as per the requirement of study and site.
- Standard protocol for freshwater microplastic sampling and analysis, guidelines involving community, collaborations and exchange of knowledge
- Circular-economy solutions to expand the scope of recycling methods, across the plastics value chain, minimization of leakage of plastic waste and least preference to disposal in landfills.
- Materials, energy and emissions are important during manufacturing of product, usage and disposal stages in LCA

### **KEY QUESTIONS RAISED BY ATTENDEES / PARTICIPANTS**

The session was concluded by answering of a series of questions by the speakers and panellists that were put up by several participants in the workshop.

### **ENCLOSURES:**

- **Press Release (s)**
- **Programme Agenda**
- **Session Flyer**
- **Concept Notes**
- **Presentation by each resource speaker**





## PRESS RELEASE

19<sup>th</sup> May 2020

National Productivity Council, under DPIIT, Ministry of Commerce and Industry, Govt. of India is organizing the National Policy Workshop through series of webinar during 12-22 May 2020 comprising of six on-line sessions as part of the UNEP lead project “Promotion of countermeasures against marine plastic litter in Southeast Asia and India” funded by the Govt. of Japan. The Webinar 4 on theme ‘Assessment of plastic pollution impact on natural capital and riverine and marine ecosystems needing policy intervention’ as part of the National Policy Workshop on Countermeasures for riverine and marine plastic litter has been organised on 18 May 2020 during 14.30 – 17.00 hrs.

The sessions highlighted the following. (a) Snapshots of work undertaken by National Productivity Council in respect of microplastic survey in river Yamuna and river Ganga; (b) Need to establish health related hazards due to plastic/microplastic on human health with rigorous studies. (c) combinations of policy instruments such as such as deposit-refund scheme combined with behavioral instruments is required to combat plastic pollution issue; (d) Case study of development of a framework and assessment of the ecosystem services of Ganga River.; (f) Methodologies and challenges in microplastic assessment in freshwater; (g) Impacts of plastic waste usage in road construction. (h) Aspects of Life cycle assessment of plastic products in Plastic value chain (k) Overview of Ocean Plastic Turned into an Opportunity in Circular Economy – OPTOCE project being implemented by SINTEF in India, China, Myanmar, Thailand and Vietnam (l) Overview of Indo-Norway Marine Pollution Initiative for Developing coherent systems for data collection and analysis for the state of Gujarat

The webinar was attended by 700 plus participants as located representing public / private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions. The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders.

The upcoming webinars are scheduled on 20 and 22nd May 2020 and shall be leading to a policy dialogue on the subject. The participants can register for the webinars via <https://www.npcindia.gov.in/NPC/User/unep>

National Productivity Council  
5-6 Institutional Area, Lodi Road,  
New Delhi 110003  
Ph: 24607313



## **WEBINAR 5**

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**IMPACT OF COVID-19 ON PLASTIC WASTE GENERATION (USED PPES  
AND WASTES FROM HCFS) AND UPCOMING CHALLENGES**



## Concept Note

### WEBINAR 5

Date: 20<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Theme:

Impact of COVID-19 on plastics consumption, innovation, logistics and waste generation (including PPEs and wastes from Health Care Facilities) and related challenges.

#### Background:

The current pandemic of the novel corona virus, COVID-19, has brought various challenges to global and local economic systems, essential services and the health sector. The health sector industry has come into intense activity especially in the context of production / consumption and innovation of PPEs and expansion in polymeric textiles and plastics usage in the domain. Further, have arisen significant challenges regarding municipal and bio-medical waste management practices and procedures (safety and health measures for employees, waste treatment requirements, general procedures introduction / amendments etc due to corona virus, and need for improvement in waste management sector due to disposal of growing quantum of PPEs as well).

#### Objective:

Understanding the problem of Covid-19 and plastics and waste management process in pandemics, and the issue of innovations and applications in PPEs and medical devices in Health sector, and concerns regarding their disposal and bio-medical waste management aspects.

#### The session shall cover the following topics:

- Covid-19 and pandemics - the implications on plastic material consumption
- PPEs - Types and composition, production and consumption scenario and value chain features.
- Demand analysis and coordination of delivery to establishments including Health Care Facilities and Law enforcement arenas and especially in the wake of epidemics.
- PPEs and Medical equipment: Historic designs and emerging innovations for plastics and polymer usage - besides need for reuse - recycling, disinfection and microbes control and management (IIT / Endoluminal sciences).
- Standards and specifications concerning PPEs ( including masks, coveralls / suits, gloves etc) and their testing.
- Use of PPEs by Doctors, Nurses and health care specialists and desired features to enable due patient care and patient testing and diagnostics stages while addressing pathogen related risks control.
- Existing Bio Medical Waste Management system in India and the guidelines and initiatives to tackle Covid-19 epidemic scenario for the BMW Management facilities (BMW Management Facility).
- Homemade PPEs and masks and use of PPEs by citizens : The expansion of bio medical waste management challenge.

#### Expected Outcome:

Recommendation for approaches to PPEs Value chain management during epidemics / pandemics.





## AGENDA

### Webinar 5

#### Impact of COVID-19 on Plastic Waste Generation (used PPEs and wastes from HCFs) and Upcoming Challenges

20 May 2020 | 14:30 – 17:30 hrs

**Moderator:** Mr. S.P. Chandak, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH

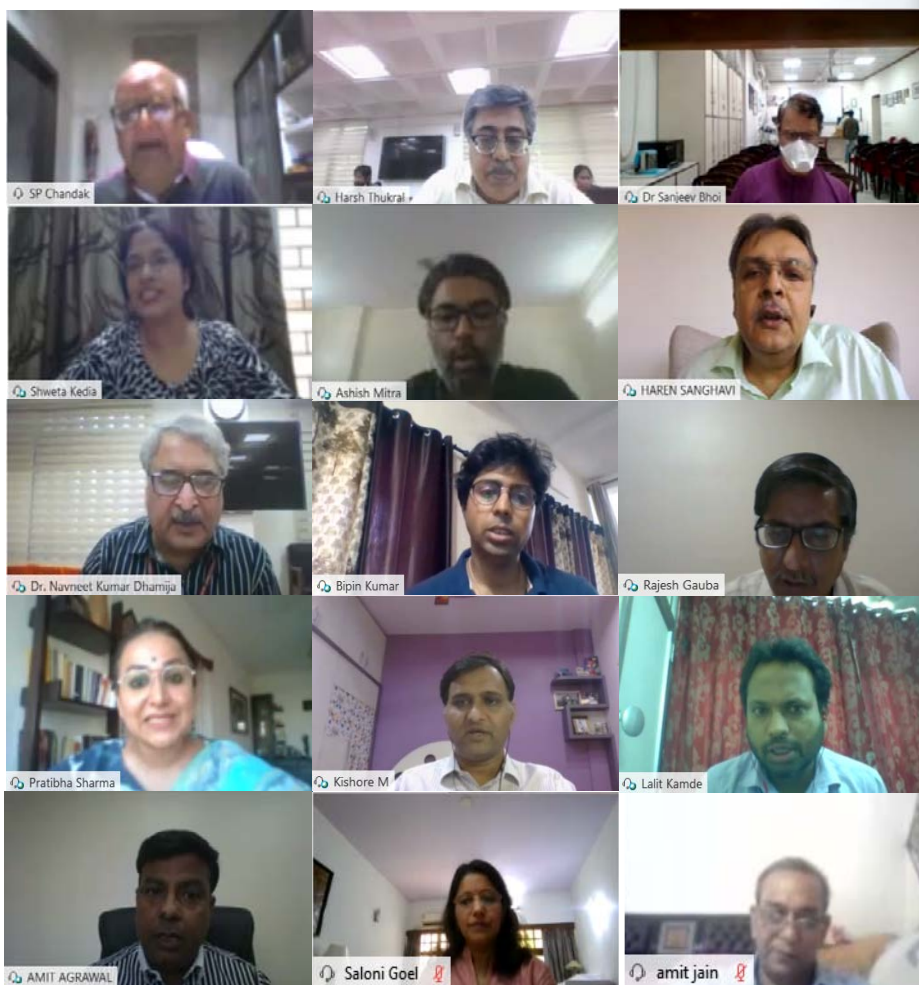
**Coordinator:** Dr. Harsh Thukral, Deputy Director, NPC

Time (hrs)	Theme/Topic	Speaker
14:30 – 14:35	Introduction to the Session	Harsh Thukral, Coordinator
14:35- 14: 50	Covid 19 as the pandemic impacting Health sector in India	Dr. Sanjeev Bhoi, Professor, Emergency Medicine, AIIMS
14:50- 15:05	Use of PPEs by Doctors, Nurses and health care specialists and desired features to enable due patient care and patient testing and diagnostics stages while addressing pathogen related risks control	Dr. Shweta Kedia Associate Professor, Deptt. Of Neurosurgery, AIIMS
15:05 – 15:20	PPEs and Medical equipment: Historic designs and emerging innovations for plastics and polymer usage - besides need for reuse - recycling, disinfection and microbes control and management	Shri. Ashish Mitra, CEO Endoluminal Sciences, Australia
15:20 – 15:35	Plastics for Health Sector and Management of Bio Medical Waste – Issues and Challenges in supply side	Shri HarenSanghavi, Managing Director, GMS Plastic Machinery Pvt Ltd.
15:35 – 15:50	Covid 19 and pandemics - the implications on plastic material consumption (Training for Health Sector in respect of Covid 19 including PPEs)	Dr. Navneet Kr. Dhamija, Advisor MoHFW
15:50 – 16:05	PPEs - Materials and Composition, Supply Chain Scenario, Standardisation and Testing (National / International)	Prof. Bipin Kumar Deptt of Textile Technology IIT Delhi
16:05 – 16:20	COVID 19 – Impact on Recycling Industry	Shri Rajesh Gauba Vice President, Petrochemicals Div., RIL
16:20 – 16:35	Single Use disposable Masks and increasing challenge on waste management	Ms. Pratibha Sharma, UNDP
16:35 – 16:50	Existing Bio Medical Waste Management system in India and the guidelines and initiatives to tackle Covid 19 epidemic scenario for the BMW Management facilities”	Shri Kishore Malviya Chief Operating Officer SMS Envocare Ltd.
16:50 – 17:30	Panel Discussion & Questions and Answers	<b>Additional Panelists</b> Ms. Saloni Goel, UNEP Mr. Amit Jain, IRG System South Asia Mr. Amit Agrawal, GTech Infra. Mr. K.D. Bhardwaj, RD, Delhi, NPC Dr. Shuklupal Maitra, Director (EN), NPC Mr. Lalit Kamde, AD, NPC

**Proceedings**

**National Policy Workshop Webinar Series on  
“Countermeasures for Riverine and Marine Plastic Litter in India”**

**20 May 2020 | 14:30 – 17:30 hrs**



**WEBINAR 5**

**Impact of COVID-19 on Plastic Waste Generation  
(used PPEs and wastes from HCFs) and  
Upcoming Challenges**



## WEBINAR 5

### Proceeding

## Impact of COVID – 19 on Plastic Waste Generation (used PPEs and wastes from HCFs) and upcoming challenges

20 May 2020 | 14:30 - 17:30 hrs

**Moderator**

**Mr. SP Chandak**

*Former Deputy Director, UNEP & Professor Emeritus, BIMTECH*

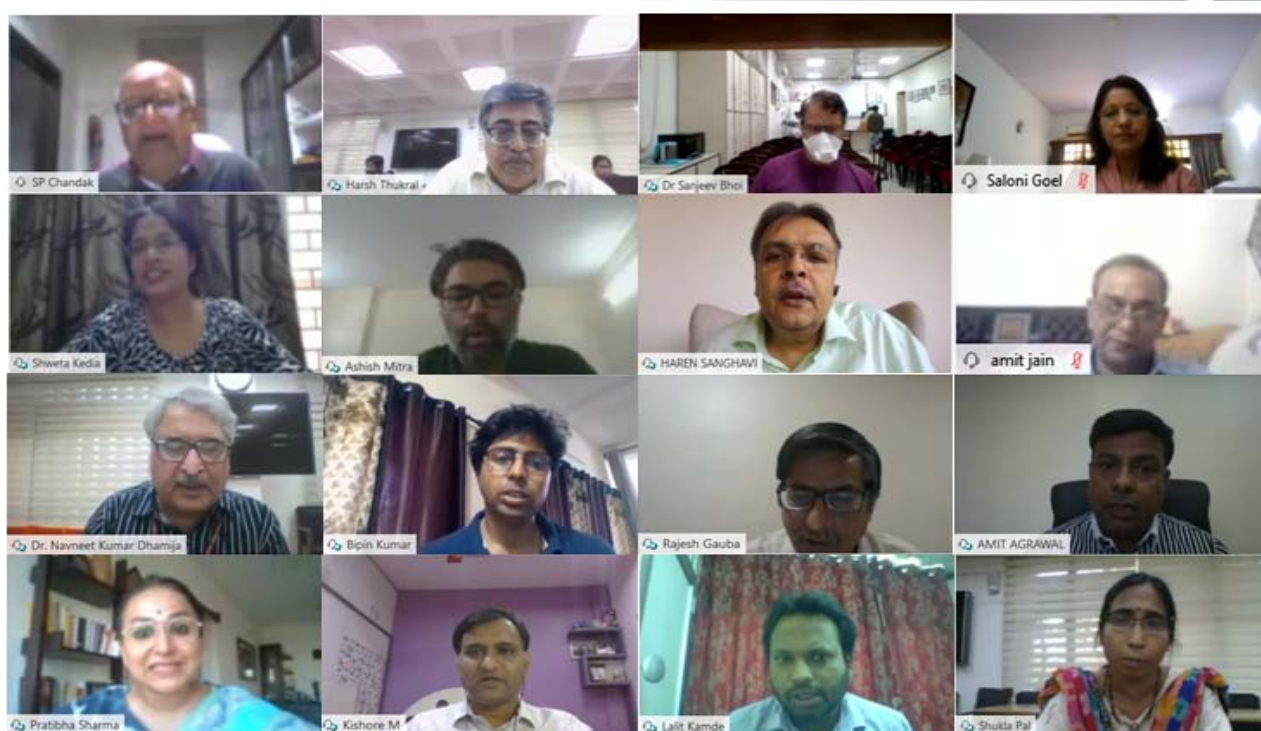
**Coordinator**

**Dr. Harsh Thukral**

*Deputy Director, NPC*

### INTRODUCTION

The global and local economic systems are facing a number of challenges due to the current pandemic from the novel Corona Virus (COVID – 19) impacting the health sector (besides various other sectors directly or indirectly) and with implications on Bio – Medical Waste Generation and its management, and the range of applications of plastics and polymers be it for innovative spectrum of medical devices or Personal Protective Equipment (PPEs), and on production and consumption of plastics and the generation of plastic wastes needing due care and attention. As research progresses in the medical front on health effects and search for vaccine for COVID – 19, parallel efforts on research and innovative product designs being made to protect, treat and / or secure the health fraternity and disaster management agencies and the citizens from the harm from COVID – 19, which also is reflecting on the logistical issues and challenges through lockdown phases and in the new scenarios of demand – supply characteristics to tackle the emergent needs via industrial production and in the bio-medical and plastic waste management and handling domain. The objective accordingly is to collate insights from the spectrum of essential services and health and economic sectors, with attention to plastics and to identify issues for policy interventions.



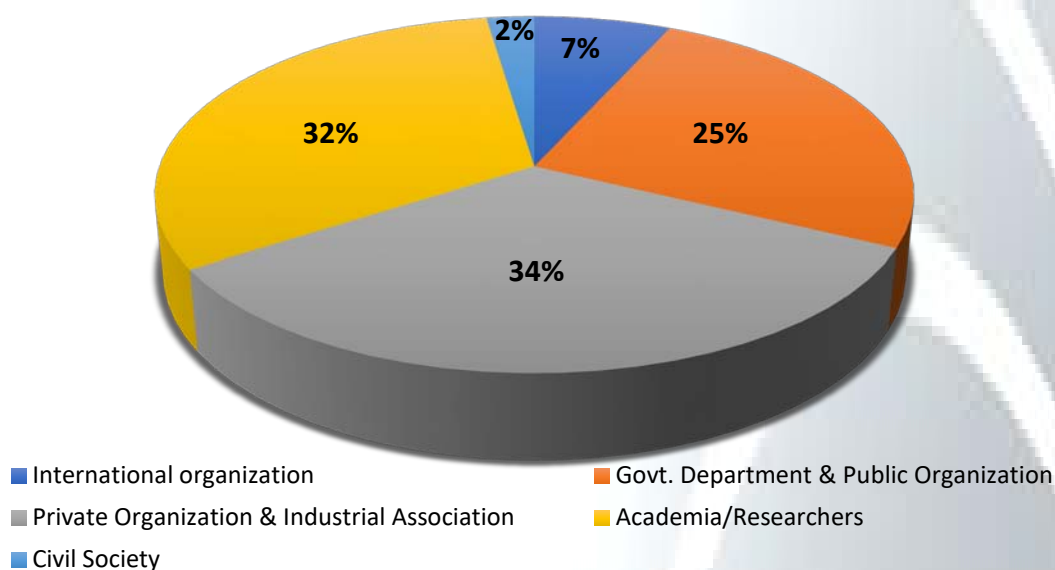


Time (hrs)	Theme/Topic	Speaker
14:30 – 14:35	Introduction to the Session	DR. Harsh Thukral, Dy. Director, NPC and Coordinator
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## PARTICIPANT PROFILE

The webinar was attended by 600 plus participants as located across 13 countries such as Bangladesh, Brunei, Denmark, Ethiopia, India, Ireland, Nepal, Norway, Philippines, Sri Lanka, Taiwan, Thailand, United States of America etc. The participants were from across various sectors (public / private organizations, civil society, academia, and from across a range of national and multilateral institutions such as UN Organisations, SINTEF, World Bank, SACEP etc). The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders. The participant profile details are depicted in **Figure 1**.

**Figure 1: Participant Profile**



Sl. No.	Countries Attended
1	Bangladesh
2	Brunei
3	Denmark
4	Ethiopia
5	India
6	Ireland
7	Nepal
8	Norway
9	Philippines
10	Sri Lanka
11	Taiwan
12	Thailand
13	United States of America

**Total Attendance**  
633

## WEBINAR PROCEEDINGS

The session was opened by a welcome to the moderator Shri S.P. Chandak former Dy. Director UNEP and Professor Emeritus BIMTECH, and all the resource speakers, panelists and attendees / participants on behalf of NPC and UNEP by Mr. Oinam Samuel, Deputy Director, NPC.

Shri SP Chandak thanked the organizers and briefly reflected on the Webinar series and the insights being generated on the project theme and objective of the National Policy Workshop through webinars 1 – 4 and exhorted the speakers / panelists to maintain the momentum and to reflect on various dimensions of the works and towards sharing significant case examples and key recommendations that could guide policy initiatives. He appreciated the way NPC had structured the programme by keeping an exclusive session on Impact of COVID-19 and its effects on Plastics sector and Plastic Waste Generation and for bringing on board a galaxy of speakers having expertise on various dimensions. He introduced Dr. Harsh Thukral, Deputy Director, NPC to introduce the theme of day to the participants.

## PRESENTATION 1:

### Introduction to the Session 'Impact of COVID 19 on plastic waste generation and challenges ahead' by Dr. Harsh Thukral, DD, NPC

The first presentation by Dr. Harsh Thukral, NPC began with the statistics of confirmed COVID cases in India and its projection by June 2020 and the research studies carried out worldwide on how the novel corona virus affects the human body and also regarding the assessments of the life of the virus on various surfaces.

**Coronavirus Can Also Attack The Nervous System, Causing Neurological Conditions And Even Viral Encephalitis:**  
 Source: Coronavirus News Mar 05, 2020 2 months ago

**Two Strains Of Coronavirus Identified, One More Aggressive. Researchers Believe That Virus Has Mutated.**  
 Source: Thailand Medical News Mar 05, 2020 2 months ago

**More Emerging Chinese Research Studies Shows That The SARS-CoV-2 Coronavirus Also Attacks The Kidneys, Pancreas and Liver**  
 Source: Coronavirus Research Mar 11, 2020 2 months ago

**Study Shows More Than 50 Percent Of Clinically Recovered Covid-19 Patients Are Still Infectious With The SARS-CoV-2 Virus**  
 Source: Covid-19 Research Mar 31, 2020 2 months ago

**New Research Indicates SARS-CoV-2 Coronavirus Is Indeed Mutating Into Various Strains That Have Specific Preference Of Attacking Human Host Cells** : Source: Coronavirus Research, Mar 16, 2020 2 months ago

Covid 19 : Research

**Coronavirus Showing Resistance To Earlier Antivirals, Seems To Be Evolving**  
 Source: Thailand Medical News Feb 05, 2020 3 months ago

**ANTIVIRAL RESISTANCE**

**Latest Coronavirus Research Reveals That The Virus Has Mutated Gene Similar To HIV and Is 1,000 Times More Potent.**  
 Source: Coronavirus Research News Feb 29, 2020 3 months ago

**Research Reveals That COVID-19 Attacks Hemoglobin In Red Blood Cells, Rendering It Incapable Of Transporting Oxygen. Current Medical Protocols Could All Be Wrong!**  
 Source: COVID-19 Research Apr 09, 2020 1 month ago

**VIRUS LIFESPAN ON SURFACES**

- Plastic and steel: 72 hours
- Cardboard: 24 hours
- Copper: 4 hours
- Hands: Several hours
- 30 mins: Airborne in closed, inside spaces

**New Research Reveals Coronavirus Can Remain Infectious For As Long As 7 Days On Surfaces!**  
 Source: Thailand Medical News Feb 08, 2020 3 months ago

**Is it adding to a tsunami of Plastics !!**

About 19,398 ventilators are available in India and orders have been placed for 50,884 more. Of these, 59,884 will be produced indigenously

The AgVa ventilator which weighs just 3.4 kilos (7.5 pounds) will help move less critical patients back to their homes as their machine is easy to transport and install, and needs low power

Plant near New Delhi

[https://www.thailandmedicalnews.com/news/covid-19-ventilators-the-two-best-innovations-an-indian-us\\$1,700-loaster-sized-ventilator-and-a-us\\$75-open-source-ventilator-from-spain](https://www.thailandmedicalnews.com/news/covid-19-ventilators-the-two-best-innovations-an-indian-us$1,700-loaster-sized-ventilator-and-a-us$75-open-source-ventilator-from-spain)

**SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)**

- 1. GOWN**
  - Only wear gown from neck to shoes, arms to end of wrists, and wrap around the back
  - Fasten in back of neck and wrist
- 2. MASK OR RESPIRATOR**
  - Secure strap or elastic bands at bottom of head and neck
  - Fit the nose band to nose bridge
  - Fit strap to back and bottom chin
  - Fit check respirator
- 3. GOGGLES OR FACE SHIELD**
  - Place over face and eyes and adjust to fit
- 4. GLOVES**
  - Extend to cover wrist of isolation gown

**USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION**

- Use PPE (Personal protective equipment)
- Limit contact between
- Use hand hygiene
- Prohibit food and beverage

**PPEs**

Against the projected demand of around 2.01 crore PPEs, orders have been placed for more than 2.22 crore such equipment.

"Earlier, there was limited domestic manufacturing of PPE in the country and almost all of them were imported. Now, we have 111 indigenous manufacturers. PPE production capacity has increased so much that it has become a Rs 7,000-crore industry in India, the biggest after China."

According to the government, the current domestic production of PPEs per day is around 1.87 lakh

**Infected Waste**

Used PPE (Personal protective equipment) Dispose in yellow bag



He further shared how this pandemic is contributing to the tsunami of plastics on a daily basis, in the form of ventilators, PPEs like Apron, gloves, goggles, masks etc., and the growing demand scenario and industrial and production response in India to meet the surge in requirements.

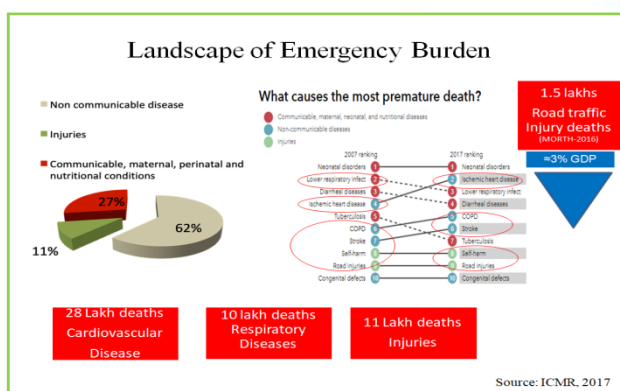
He concluded by highlighting that the webinar was designed to address various dimensions of the engagement of plastics in the emergent scenario that could cover the following aspects:

- The impact COVID on Health Sector & implications on plastic material consumption
- PPEs - Types and composition, production and consumption scenario and value chain features
- Demand analysis and Supply and coordination of delivery of Plastics and PPEs to establishments including Health Care Facilities and other agencies engaged in epidemic / Pandemic management
- Innovations, Standards, testing and specifications concerning Medical devices and PPEs
- Single Use disposable Masks and increasing challenge on waste management
- Existing Bio Medical Waste Management system in India and the guidelines and initiatives to tackle Covid 19 epidemic scenario
- Discussions and recommendations to explore approaches to PPEs value chain management during epidemics / pandemics

**PRESENTATION 2:**

**Covid 19 as the pandemic impacting Health sector in India by Dr. Sanjeev Bhoi, Professor Emergency Medicine, AIIMS**

The second presentation was made by Dr. Sanjeev Bhoi, Professor of Emergency Medicine, AIIMS, to reflect on Covid 19 pandemic by reflecting on a case scenario and the challenges to address symptoms and complaints from a patient needing immediate attention and to address concerns as to wherefrom, and quality and type and nature of care that could be received. The burden of disease and its landscape further reflected. Dr. Bhoi indicated that modern and traditional care system coexists in India, and there existed a challenge of a lack of adequate quantum of trained frontline providers. The variation between emergency care and specialized care system also highlighted along with the dimensions.



Dr. Bhoi emphasized that pre-hospital and emergency care needed strengthening to check premature mortality. He indicated significance of ambulance aggregator model, prehospital notification aspects, key performance indicators and financial model of prehospital care services to be linked to KPIs and the immediate and long term measures required. The recommendations include creation of dedicated COVID facility within health facility, quarantine at home / isolation facility for asymptomatic cases, training of health care workers, and to address surge capacity by rearrangement of human resource, equipment, supplies and diagnostic testing including PPEs.

The key recommendations include the use of telemedicine, undertaking research and innovation (pertaining to drugs, devices, diagnostics etc.), Continuing Medical Education / CME for care providers in a hub and spoke model, psychological support aspects and establishing a robust emergency care system with protected funding, epidemic intelligence service program, suitable stock pile (drugs, devices, diagnostics), suitable audit of acute care, incentive system for acute care facility etc.

**PRESENTATION 3:**

**Use of PPEs by Doctors, Nurses and health care specialists and desired features to enable due patient care and patient testing and diagnostics stages while addressing pathogen related risks control by Dr. Shweta Kedia, Associate Professor, Deptt. Of Neurosurgery, AIIMS**

The third presentation was undertaken by Dr. Shweta Kedia Associate Professor, Deptt. Of Neurosurgery, AIIMS who elaborated on the types of personal protective equipment being used by the health care staff from masks to air purifying respirators, goggles, face shield to gloves and gowns. She also discussed about the limitations of inappropriate PPEs in terms of increased breathing resistance, Fit-testing needs, the issues of visibility, communication difficulties, psychological issues and about increased risk of infection.


**Defining PPE**

Equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses

**We need to know....**

- When it is necessary
- What kind is necessary
- The limitations of the equipment
- How to properly put it on, adjust, wear and take it off
- Proper care, maintenance, useful life, and disposal of the equipment

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION  
<http://www.mohfw.gov.in/pdf/GuidelinesonrationaluseofPersonalProtectiveEquipment.pdf>




**Goggles**

- ✓ Antifog Coating layer
- ✓ Comfortable Nasal Care
- ✓ Multi hole vent design for airflow
- ✓ Adjustable Mask belt



**Face shield**

Used as an additional physical barrier to respiratory droplets



Am J Infect Control. 2020 Apr 2  
 doi: 10.1016/j.ajic.2020.03.016

**Gloves**

GLOVE TYPE	DEFINITION	ADVANTAGE	PROTECTION LEVEL
Latex Gloves	Made of natural rubber	Highest comfort, flexibility, fit and tactile sensitivity	Bacteria, viruses
Nitrile Gloves	Made of synthetic material	Stretchy, durable	Chemicals, viruses
Vinyl Gloves	Made of synthetic material, sometimes referred to as synthetic	Cost-efficient synthetic option, comfortable	Chemicals

Multiple layers of gloves limit dexterity



Am J Infect Control. 2016 Dec 1;44(12):1645-1649

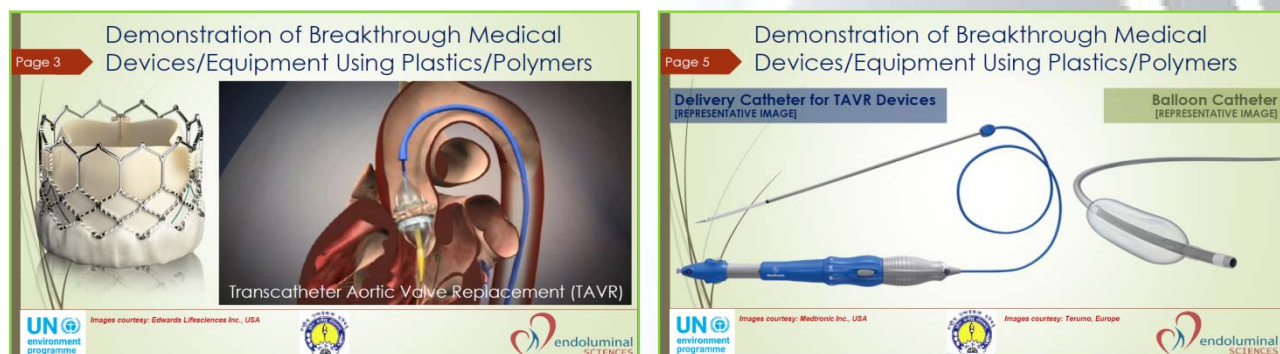
Dr. Shweta highlighted about key requirements and innovations that would be needed to be addressed from the innovators and manufacturing phases for health sector.

She concluded her talk by highlighting that Right PPE, donned correctly, worn in safely and safe doffing is must and that assessing the impact of PPE on health care worker’s performance is significant.

#### PRESENTATION 4:

#### **PPEs and Medical equipment: Historic designs and emerging innovations for plastics and polymer usage - besides need for reuse - recycling, disinfection and microbes control and management by Shri Ashish Mitra, CEO, Endoluminal Sciences, Australia**

Shri Ashish Mitra in his presentation delved on breakthrough medical devices and equipment that utilized plastics and polymers with case examples of cardiovascular devices (example Delivery catheter for TAVR devices, Balloon Catheter etc) and neurosurgery devices (including shift from stereotactic surgery to micro-stereotactic surgery) in particular. He showcased the transcatheter Aortic Valve replacement technique and also shared statistical insights from clinical observations about the success rates of the alternative procedures vis a vis open heart surgery and the importance of plastics that make it possible to enable such procedures and provide good patient treatment outcomes, be it from anaesthesia time requirements, procedure time aspects, ICU stay needs etc.



In his concluding perspectives he emphasized the importance of bringing design considerations in for recycling devices including for example ventilators (from greater application of plastics vis a vis the earlier trends on using more metal) and also design for reusability especially in the context of PPEs. He reflected on the importance of using polymers judiciously in medical equipment development and also shared reusability prospects of PPEs via suitable product and component elements amenable to washing, sterilizing etc. He also indicated need for impactful incentives for significant innovations to occur that would benefit the health sector and utilize material including plastics efficiently.

He addressed various questions on the design aspects for PPEs and of differentiations between taped and untaped and woven and non – woven fabrics and reflected on seams as well, all of which add to the protection of health care professionals by serving as barriers to fluids and microbes at locations on PPEs where the stitches and ties are provided as well.



**PRESENTATION 5:**

**Plastics for Health Sector and Management of Bio Medical Waste – Issues and Challenges in supply side by Shri HarenSanghavi, MD GMS Plastic Machinery Pvt. Ltd. and former President AIPMA**

The fifth presentation was delivered by Shri Haren Sanghvi who emphasized that plastics are indispensable, especially during a pandemic. He discussed about the increased consumption of plastic during COVID outbreak in the form of PPEs, Masks, Gloves, Shields, Hair Covers, Shoe Covers, Thermoguns, Oximeters, Ventilators, Kitsfor Ventilators, Goggles, Single Use Disposable Food Containers etc. He highlighted that plastic helps mitigate threat of further aggravation of the situation.

He further presented the expected monthly demand of PPEs in India and the adequacy of our country in meeting these demands. He then talked about how this increase in plastic consumption is leading to the problem of waste management and mixing of Biomedical and Infectious solid/plastic waste and the increased burden on Biomedical Waste Treatment Facilities.

**Page 2**

**Covid 19 and Pandemics - The Impact on Health Sector & Implications on plastic material consumption**

- Covid 19 and Pandemic has affected almost all the Industries.
- The Medical fraternity is the most affected as it had to be quickly geared to fight this Pandemic.
- Plastics played a key role in protecting people, especially frontline workers, during the COVID-19 pandemic.
- The Maximum needed products were Masks, PPE's, Gloves, Shields, Hair Covers, Shoe Covers, Thermo guns, Oximeters, Ventilators, Kits for Ventilators, Goggles, Single Use Disposable Food Containers, etc.
- Health sector was given the highest priority with yielding results.
- Plastic helps mitigate threat of further aggravation of the situation.
- Plastics Also Provides Safety - Protect healthcare equipment's as they need to be delivered in sterilized condition.
- Plastics also Provide Hygiene - The packaging material used for essential items like food etc., have proven its significance at these times to mitigate contamination threat.

**Plastics Are Indispensable, Especially During A Pandemic.**

**Page 3**

**Demand analysis, Supply & Coordination of delivery of Plastics and PPE's**

- The World Health Organization (WHO) estimates that some 89 million medical masks, 76 million examination gloves and 1.6 million goggles will be needed for the COVID-19 response every month while the pandemic lasts. (Source: The Hindu- Business line News article).

Year	Market Size (USD Billion)
2020e	25.1
2021p	29.4

**CAGR 17.2%**

- The global medical plastics market is estimated to be USD 25.1 billion in 2020 and is projected to register a CAGR of 17.2% between 2020 and 2021.
- The market growth is attributed to the growing demand for better and efficient healthcare system in emerging economies. Also, increasing requirement of medical plastics in production of critical care systems is propelling growth.
- India, China, the US, UK, Iran, Italy, and France are expected to witness high consumption of medical plastics between 2020 and 2021 due to increasing demand for ventilators, thermals scanners, respirators, and other critical care systems

Note: e-estimated, p-projected

He shared recommendations for the handling, treatment and disposal of waste generated during COVID 19, which included the following

- To break the chain of transmission of the virus, waste segregation at source should be emphasized to the best possible extent.
- A separate collection mechanism should be ensured to avoid the risk of community spread
- Civil society should also be made aware of this requirement so as to facilitate collection of segregated waste and avoid any unscrupulous reuse that can enhance the risk.
- A need to prepare infrastructure and operation modalities for fastest disposal and aggressive disinfection during the holding period.
- Other locations such as stadiums, hotel rooms, marriage halls etc. should be made available exclusively for Corona patient treatment facility so that management of active Covid-19 waste from singular location can be made more efficiently.
- Real time data of waste generation and disposal should be monitored to ensure that none of the infectious waste is left out undisposed

**PRESENTATION 6:**

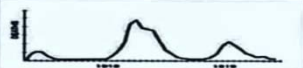
**COVID 19 and pandemics - the implications on plastic material consumption (Training for Health Sector in respect of COVID 19 including PPEs) by Dr. Navneet Kumar Dhamija, Adviser, Ministry of Health and Family Welfare**

Dr. N.K. Dhamija in his presentation highlighted the historic problem concerning pandemics (about 9 before 20<sup>th</sup> century and 7 pandemics during 20<sup>th</sup> century respectively) and that over 352 Million lives having been lost due to pandemics since 165-180 AD. He further reflected on how plastics were a bedrock of medical equipment design and of protective gear and emphasized that a study highlighted that Corona Virus could live upto 72 hours on plastics and other hard shiny surfaces. Dr. Dhamija enumerated a spectrum of plastics based equipment such as goggles, face shield, IV Fluid bottles, Cannulas, Catheters IV sets, Urobags, Blood bags, BT sets, syringes, suction catheters, ET tubes, oxygen masks and tubes, BMW carrybagsetc that are directly related to health care besides reflecting on PPEs and further emphasized on the importance of training for COVID Warriors for use of the equipment besides indicatively on the quantum of plastic waste generation anticipated. He further highlighted initiatives by Ministry of Health and Family Welfare.

**allow a repeat of same mistake in 1918....**

**LESSONS OF HISTORY**

The most severe pandemic in history was the Spanish Flu of 1918. It lasted for 2 years, in 3 waves, with 500 million people infected and 50 million deaths. Most of the fatalities happened in the 2<sup>nd</sup> wave. The people felt so bad about the quarantine and social distancing measures that when they were first lifted, the people rejoiced in the streets with abandon. In the coming weeks, the 2<sup>nd</sup> wave occurred, with tens of millions dead.

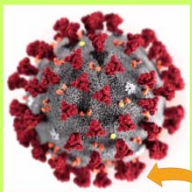


Let's not repeat history in the time of Covid-19

**WHAT IS A NOVEL CORONAVIRUS/COVID-19 ?**

Coronaviruses are a large family of viruses that cause a wide range of illnesses from common cold to more severe diseases like:

- Severe Acute Respiratory Syndrome (SARS)
- Middle East Respiratory Syndrome (MERS)



New viruses periodically appear in the world

Novel Coronavirus 2019 / nCoV is a type of coronavirus that has not been previously identified in humans  
 COVID-19 is the disease caused by it

**THE IMPACT OF COVID-19 ON THE MOVEMENT TO END PLASTIC WASTE**

- Versatile, Affordable and Ever-present plastics have been essential to keeping hospitals running and protecting our frontline workers during the COVID-19 pandemic. They're the bedrock of medical equipment and protective gear
- As demand skyrockets for masks, goggles, face shields, gloves, gowns and disposable bags etc. one thing is clear: plastics are indispensable, especially during a pandemic
- A Study recently found that the virus can live up to 24 hours on paper, cardboard and fabrics, compared to up to 72 hours on plastics and other hard, shiny surfaces

**COVID – 19 IMPACT ( HEALTH SECTOR RELATED )**

<b>DIRECTLY HEALTH SECTOR RELATED</b>	<b>INDIRECTLY RELATED TO HEALTH SECTOR</b>
<ul style="list-style-type: none"> <li>Goggles</li> <li>Face shield</li> <li>IV fluid bottles</li> <li>Cannulas</li> <li>Catheters IV sets</li> <li>Urobags</li> <li>Blood bags</li> </ul>	<ul style="list-style-type: none"> <li>BT sets</li> <li>Syringes</li> <li>Suction catheters</li> <li>ET tubes</li> <li>Oxygen masks &amp; tubes,</li> <li>BMW carrybags</li> <li>Water bottles</li> <li>Take away packaging</li> <li>Cold drink bottles</li> <li>Disposables' plastic items</li> <li>Polybags &amp; Plastic Garbage Bags</li> <li>Sanitizer bottles</li> </ul>


**AND MANY MORE**

**PRESENTATION 7:**

**PPEs - Materials and Composition, Supply Chain Scenario, Standardisation and Testing (National /International) by Prof. Bipin Kumar, Deptt. Of Textile Technology, IIT Delhi**

The presentation by Prof. Bipin Kumar as a review on PPEs for COVID – 19 delved into various technical aspects of PPEs, specifically Coverall, Masks of various types and the mask / product developed at IITD called Kawach.


**Coverall – Testing and Standard**



		BRAND
		MODEL TYPE
Test Title		WHO Rapid Advice Guideline for PPE
Biohazard performance	Resistance to blood penetration*	Option 1: minimum ISO 16603 Class 3
	Resistance to blood penetration with virus*	Option 1: minimum ISO 16604 Class 2
Other performance criteria		
Physical performance	Tensile strength*	ISO 13934-1 (MD/CD)
	Tear Resistance*	EN ISO 9073-4
	Puncture resistance*	EN 863
	Abrasion resistance*	EN 530 Method 2
Whole suit perform	Basis weight	
	Seam strength*	EN ISO 13935-2
	Whole suit performance*	EN 14126

IIT Delhi  
Bipin Kumar  
bipin@textile.iitd.ac.in

**Coverall – Testing and Standard**



Tensile strength (dry and wet) (N)	Nonwoven: IS 15891 (Part 3), Woven: IS 1569 (Part 1)
Bursting strength (dry and wet) (kPa)	IS 1966 (Part 1)
Seam strength (dry and wet) (N)	Nonwoven: IS 15891 (Part 3), Woven: IS ISO 13935 (Part 1)
Blood resistance (see note 1), Class 5, (for pressure upto 14 kPa)	IS 16546/ISO 16683
Viral resistance (see note 1) Class 5, (for pressure upto 14 kPa)	IS 16545/ISO 16684
Cleanliness-microbial (CFU/100 cm <sup>2</sup> ) (for non-sterile coverall)	ISO 11737-1
Cytotoxicity	IS/ISO 10993- 5
Irritation and skin sensitization	IS/ISO 10993- 10

IIT Delhi  
Bipin Kumar  
bipin@textile.iitd.ac.in

A product of IIT Delhi startup ETEX




	KAWACH™	N95	Surgical
Filtration (3 µm)	98%	>95%	>90%
Filtration (0.3 µm)	90%	95%	>80%
Price (INR)	45	100-700	5-20
Fit	Secure	Secure	Loose
ΔP - fPa/cm <sup>2</sup>	<30	>80	>60
Splash (180 mmHg)	Pass	Pass	Pass
Biodegradability	Yes	No	No
Weight (g)	13-15	<30	<15

Rs. 45/- Only



MAKE IN INDIA



**Current Scale**

- 800000**  
KAWACH units dispatched in last 10 days
- 30 Lakh**  
KAWACH units to be dispatched in next 10 days
- 2-3 lakh**  
Current per day production capacity of KAWACH mask

The focus on raw materials and technology aspects provided an understanding on the types of coveralls (woven, nonwoven, knitted) and the associated technologies such as weaving (plain), spun-bond / Melt Blown or weft knitting. The raw materials for woven and knitted being used have been primarily PET / Nylon and for non woven is polypropylene. It is indicated that laminated material could be amongst TPU/Teflon/PE in all cases. Dr. Bipin Kumar further highlighted aspects of Coverall testing and standard from the whole suit performance, physical performance and bio-hazard performance contexts and enumerated test titles such as seam strength and whole suit performance, and for physical performance abrasion resistance, puncture resistance, tear resistance, tensile strength as performance criteria considerations. In the context of biohazard the importance to resistance to blood penetration and resistance to blood penetration with virus as well amongst criteria elements. He highlighted the Guidelines or ISO standard references etc for the tests and the units involved.

In addition he highlighted aspects of tests such as viral resistance, cleanliness – microbial for non sterile coverall, cytotoxicity measures and irritation and skin sensitization tests etc. He also indicated the variations in parameters amongst different coverall brands / companies providing PPEs as a comparison on various test parameters. He also indicated cost factors for tests such as synthetic blood penetration resistance test as per ASTM F 1670 (@ Rs. 3700/- per sample + GST) and Viral penetration resistance test ASTM F 1671 (@ Rs. 10000/- per sample + GST) along with pictorial depiction of the PPEs.

Similarly Prof. Bipin Kumar highlighted features of Masks and their types such as Medical (N95), Surgical, Textile Based and Protective Mask and Normal textile based mask and their technology, raw materials (polypropylene or Cotton/PET/Nylon alternatives) and filter materials aspects (whether melt blown or no filter layer etc). He also delved on European



standards EN 149 + A1:2009 and compared FFP1, FFP2, and FFP3 regarding filtration protection (0.3 Micron) ranging from 80% to 99% for propylene microfibers, and indicated that WHO recommends that FFP2/3 for 4-6 hours usage.

He also compared N95, N99 and N100 masks for their filtration protection (0.3 Micron), ranging from 95% to 100% for high penetrating aerosols (0.3 micrometer diameter). He also clarified that N95 / R95 / P95 was indicative of N = Not Resistance to Oil; R = Resistant to Oil and P = Strongly resistant (oil proof) and indicated importance of additional tests such as fit test and others. Further, a comparison has been provided between kawach (a mask from IITD startup ETEX), N95 and Surgical masks across parameters such as Filtration (3 micrometer), Filtration (0.3 Micrometer), Fit, Delta P (in Pascals / cm<sup>2</sup>), Splash (at 160 mm Hg), biodegradability aspects and weight and on price which was found to be highly competitive (@ Rs. 45 per mask) and how it has been found suitable for India. He also highlighted the scale and pace at which Kawach was gaining market share.

## PRESENTATION 8:

### COVID 19 - Impact on Recycling Industry by Shri Rajesh Gauba, Vice President, Sustainability and Recycling, Reliance Industries Ltd.

The eighth presentation by Shri Rajesh Gauba, RIL, commenced with the government decisions in various states to revoke the ban on plastics, as plastic are proving to be a life savior in the prevailing pandemic though PPEs, packaging, relief material etc.

He discussed about the plastics properties and advantages and that these makes it material of choice across Industries and ensures food security, safety, hygiene with lower Carbon footprints. He also highlighted that many studies indicate alternatives to plastics are at higher environmental costs.

5

Plastics Improve Quality of Life : Plastics ensure food security, safety, hygiene with lower Carbon footprints

Properties	Advantages	Industries & Applications
<ol style="list-style-type: none"> <li>1. Light weight</li> <li>2. Food Grade</li> <li>3. Durable</li> <li>4. Easy processing ability</li> <li>5. Cost effective</li> <li>6. Recyclable</li> <li>7. Low carbon footprint</li> <li>8. In end of life plastics can be used as source of energy</li> </ol>	<ol style="list-style-type: none"> <li>1. Provide Hygienic Packaging</li> <li>2. Saves Product Contamination</li> <li>3. Protects goods from Adulteration</li> <li>4. Ensure Right Quantities</li> <li>5. Provides Moisture Barriers</li> <li>6. Increases shelf life for products</li> <li>7. Packages &amp; transport more product per unit weight of packaging</li> </ol>	<ol style="list-style-type: none"> <li>1. FMCG : Packaging</li> <li>2. Agriculture : Pipes, Crop covers, greenhouse, mulch films etc</li> <li>3. Infrastructure : Pipes, temporary cladding, doors , windows furniture</li> <li>4. Automobile and Appliances – Components, protection</li> <li>5. Industrial goods : Packaging</li> <li>6. Medical : Syringes , Gloves, Blood Bags, Apron etc.</li> </ol>

Plastics Properties and Advantages makes it material of choice across Industries

8

Plastics usage in health care has increased due to Covid 19 – Capacity augmentation required for managing waste

Biomedical Waste Management in India - MTD

Year	MTD
2015	486
2016	501
2017	515
2018	530

Covid 19 → 20 KTM in PPEs, Masks & Gowns – Production has increased to 1000 MTD

He emphasized that, Plastic is not a problem, the management of plastic waste is. He went on to discuss that plastics usage in health care has increased due to Covid19 and capacity augmentation is required for managing waste.

He further talked about aspects of plastic recycling in India and that major usage is in mixing with virgin plastics for reducing cost. He also flagged the challenges of plastic recycling and indicated operating cost for recyclers to go up because of labour shortages and HSE issues.

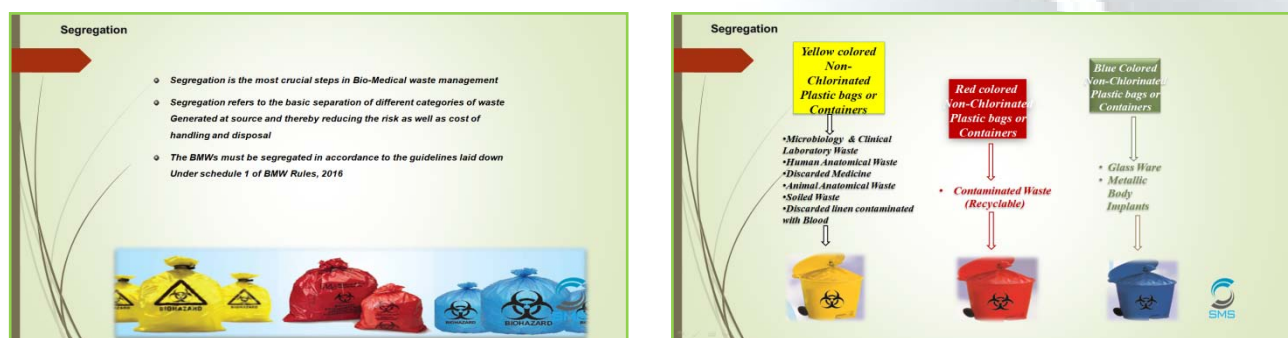
In the end he showcased the case study of Versova beach clean-up and concluded that with right focus, all kinds of plastic waste can be managed.



## PRESENTATION 10:

### Existing Bio Medical Waste Management system in India and the guidelines and initiatives to tackle Covid 19 epidemic scenario for the BMW Management facilities by Shri Kishore Malviya, COO, SMS Envocare Ltd.

In his presentation Shri Kishore Malviya brought practical insights on the management of Common Bio Medical Waste Management Facilities and reflected on challenges faced by CBWTF and the initiatives being undertaken to address COVID 19 scenario. He shared the process flow diagram of a typical Bio Medical Waste Management System and color coding elements and emphasised the relevance of segregation at source and of following of guidelines in the segregation process and presented snapshots of facilities in the value chain from transportation to treatment (autoclave, incinerator, ETP aspects etc).



Shri Malviya also delved on PPEs and their disinfection process being followed and reflected upon CPCB guidelines pertaining to managing COVID 19 wastes. He shared the challenges faced by CBWTFs from the perspective of administrative to operation to financial and social challenges and highlighted key initiatives taken or could be addressed by Government, Health Care Facilities and CBWTFs.

He reflected on some findings of concern about quality and supply of PPEs and that segregation needed due attention as otherwise there are risks for BMW workforce and indicated that an application is likely to be developed for live tracking of COVID 19 wastes as well.

He reflected on current gaps including interpretation aspects of guidelines especially at HCFs and about the excessive fear of COVID waste that was observed in the field and emphasised that MSW wastes and their disinfection aspects be taken up at MSW facilities rather than at CBWTFs and that there is a need to check food waste entering CBWTFs for incineration as well that cause technical problems in incinerators on the one hand and reducing capacity to handle the more critical BMW waste that should be part of yellow bags for incineration at CBWTFs.

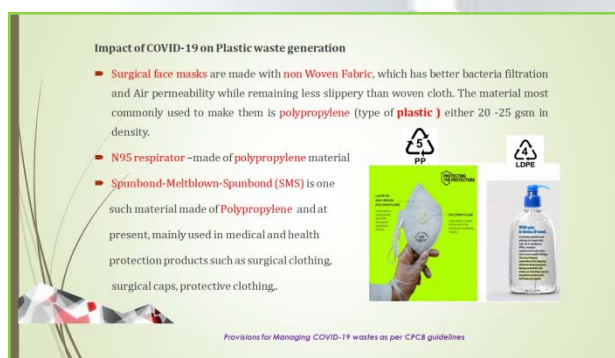
He suggested further training to HCEs and strict monitoring of quarantine centres and emphasised the importance of addressing MSW (food, water bottles, cartage, plates and disposable cups etc) from COVID isolation wards to be suitably color coded or with a black label to be sent to separate disposal process with separate collection, disinfection and disposal channel.



**PRESENTATION 11:**

**Provisions for Managing COVID 19 wastes as per CPCB Guidelines by Shri Lalit Kamde, AD, RD Hyderabad, NPC**

As part of the panelists Shri Lalit Kamde came forward to reflect through a few slides as requested by the moderator / coordinator to add to insights on COVID 19 waste management related guidelines. He touched upon COVID 19 isolation wards, Sample Collection centres and laboratories for COVID 19 and Quarantine Camps, Non - Quarantined Homes related aspects and guidelines. He provided a quick overview of the importance of color coded bins, dedicated collection systems and reporting of operations and of the features of addressing various types of PPEs such as goggles, face shield, splash proof apron, hazmet suit, nitrile gloves to be routed into red bags for appropriate treatment from isolation wards.



In addition Shri Lalit emphasised the importance of pre-treatment of viral transport media, plastic vials, vacutainers, Eppendorf tubes, plastic cryovials, pipette tips etc and routing to red bags from laboratories. He also highlighted roles and duties of the process of management in quarantine camps/home care areas, CBWTFs, Waste water treatment issues from HCFs or Isolation Wards and highlighted the standard practices for disposal of used masks and gloves including disinfection actions required. He reflected on the plastics involved in the PPEs and emphasised the need for creating greater awareness on using and disposing PPEs and on guidelines for handling COVID 19 wastes.

**PRESENTATION 12:**

**SWATCH – Smart Garbage Decomposition Machine – Designed for COVID - 19 Waste and MSW by Shri Amit Agrawal, CEO, G-Tech Infra**

As part of the panelists Shri Amit Agrawal introduced the Smart Garbage Decomposition Machine named SWATCH to the participants as developed by the firm G-Tech Infra. He reflected upon its focus on both COVID – 19 Waste and Household / Organic Waste. It was indicated that the machine decomposes wastes other than glass and metals and uses about 3KW power to clean exhaust, and that the machine uses about 1000 – 1500 sq.ft. area and the emissions meet CPCB norms, It has a chamber with strong magnetic field and hyperthermia ( at 300 – 450 Degree Celsius).



Shri Agrawal indicated that there is a closed chamber destruction/decomposition using plasma and ionization techniques along with concentrated magnetic action technology. It was emphasised that mixed waste can be fed into the system, including COVID – 19 waste and MSW and that a residue of ash is generated, and that operation and maintenance needs are low and that the plant can have a life of 20 years. A comparative perspective with incinerators is provided along with data on air emission test results. It has been indicated to have scrubber system. Further, that the machine could handle waste upto 2 tonnes per day and that it could be used in areas in proximity to hospitals and community centres and remote areas.

## **SALIENT FEATURES OF THE WEBINAR 5**

The session and presentations highlighted the following aspects:

(a) The research initiatives in health sector and beyond pertaining to COVID 19 and impacts across various sectors (positive and negative) and the emergent tsunami of plastics; (b) Elaboration by Doctors regarding types of personal protective equipment being used by Doctors and the health care staff (including in Emergency medicine and Surgical Departments etc), addressing components such as masks and air purifying respirators, goggles, face shield, gloves and gowns and deliberations on the need for innovations in PPEs to improve breathability, fit aspects, issues of visibility, enabling overcoming communication difficulties and checking risks from infection etc, besides strengthening reusability and recyclability aspects along with emphasis on mass training in the use of PPEs for a vast spectrum of

COVID - 19 warriors; (c) Highlights regarding breakthrough medical devices and equipment that signalled importance of plastics and polymers with case examples of cardiovascular devices and neurosurgery devices contributing to enhanced quality and outcomes of health care, in addition to emphasis on incorporating principles for 'design for environment'; (d) Insightful review of PPEs for COVID – 19, detailing the type (woven, non-woven, knitted etc), and the materials including polymers and composition, and standards and testing of parameters desirable for health sector; (e) Aspects of Demand and Supply of polymers and

industry response for various plastics for health sector and issues concerning recycling / recyclability of plastic waste; (f) Single Use disposable Masks and increasing challenge on waste management in the community; (g) Deliberations on pre-covid and during COVID 19 related Bio-Medical Waste Management systems and practices, and new developments concerning COVID 19 related guidelines to help tackle emergent waste streams – amongst domestic hazardous infectious wastes and from quarantine centres, isolation wards, and laboratories etc. and the significance of segregation of waste streams for efficient operations; (h) Insights on machinery and equipment to handle and manage Bio-Medical Wastes in the wake of COVID 19 and their operational considerations etc.

### **KEY QUESTIONS RAISED BY ATTENDEES / PARTICIPANTS**

The session was concluded by answering of a series of questions by the speakers and panellists that were put up by several participants in the workshop.

### **ENCLOSURES:**

- **Press Release (s)**
- **Programme Agenda**
- **Session Flyer**
- **Concept Notes**
- **Presentation by each resource speaker**





## PRESS RELEASE

21 MAY 2020

National Productivity Council, under DPIIT, Ministry of Commerce and Industry, Govt. of India is organizing the National Policy Workshop through a series of webinars during 12-22 May 2020 comprising of six on-line sessions as part of the UNEP led project “Promotion of Countermeasures against marine plastic litter in Southeast Asia and India”, funded by the Govt. of Japan. The Webinar - 5 on theme “Impact of COVID – 19 on Plastic Waste Generation (used PPEs and wastes from HCFs) and upcoming challenges” as part of the National Policy Workshop on Countermeasures for riverine and marine plastic litter has been organized on 20 May 2020 from 14.30 – 17.30 hrs.

The Webinar via twelve insightful presentations highlighted the following aspects (a) The research initiatives in the health sector and beyond pertaining to COVID 19 and impacts across various sectors (positive and negative) and the tsunami of plastics; (b) Elaboration by Doctors regarding types of personal protective equipment being used by Doctors and the health care staff (including in Emergency medicine and Surgical Departments etc), addressing components such as masks and air-purifying respirators, goggles, face shield, gloves, and gowns and deliberations on the need for innovations in PPEs to improve breathability, fit aspects, issues of visibility, enabling overcoming communication difficulties and checking risks from infection etc, besides strengthening reusability and recyclability aspects along with an emphasis on mass training in the use of PPEs for a vast spectrum of COVID - 19 warriors; (c) Highlights regarding breakthrough medical devices and equipment that signaled the importance of plastics and polymers with case examples of cardiovascular devices and neurosurgery devices contributing to enhanced quality and outcomes of health care, in addition to the emphasis on incorporating principles for ‘design for the environment’; (d) Insightful review of PPEs for COVID – 19, detailing the type (woven, non-woven, knitted, etc), and the materials including polymers and composition, and standards and testing of parameters desirable for health sector; (e) Aspects of Demand and Supply of polymers and industry response for various plastics for the health sector and issues concerning recycling/recyclability of plastic waste; (f) Single-Use disposable Masks and increasing challenge on waste management in the community; (g) Deliberations on pre-COVID and during COVID 19 related Bio-Medical Waste Management systems and practices, and new developments concerning COVID 19 related guidelines to help tackle emergent waste streams – amongst domestic hazardous infectious wastes and from quarantine centers, isolation wards, and laboratories etc. and the significance of segregation of waste streams for efficient operations; (h) Insights on machinery and equipment to handle and manage Bio-Medical Wastes in the wake of COVID 19 and their operational considerations etc.

The webinar was attended by 630 plus participants as located across 13 countries representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions such as UN Organisations and the World Bank. The Webinar has been highly appreciated by participants and is attracting attention from a wide range of stakeholders.

The next webinar is scheduled for 22nd May 2020 and shall be leading to a policy dialogue on the subject. The participants can register for the webinars via <https://www.npcindia.gov.in/NPC/User/unep>

National Productivity Council  
5-6 Institutional Area, Lodi Road,  
New Delhi 110003  
Ph: 24607313



## **WEBINAR 6**

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**SCENARIOS TO COUNTER PLASTICS LITTER BY OVERCOMING BARRIERS  
AND IDENTIFYING ENABLING MEASURES**





## Concept Note

### WEBINAR 6

Date: 22<sup>nd</sup> May 2020 | 14:30 – 17:00 hrs

#### Theme:

Scenarios to counter plastics litter in river and marine environment by overcoming barriers and identifying enabling measures and shaping roadmap and strategy ahead.

#### Background:

In the current plastics era, the problem of riverine and marine litter has emerged as a global concern as plastics leakage has been significant over the decades. To increase plastics and various material circularity, leakage of plastic from the human technosphere needs addressing via countermeasures that would include a spectrum of policy interventions, effective implementation of rules, good depository schemes and economic instruments. Greater scope has arisen for a combination of informal and organized systems to work for collection of plastic waste and recycling arrangements, introducing new product designs to enable recycling and other novel treatment and disposal options, besides promotion and propagation of alternatives including bioplastics.

#### Objective:

Understanding insights from countermeasure project for Marine plastic litter in India and reflecting on the need for development of Regional plastic leakage Model to overcome barriers regarding Database construction and analysis. Further exploring policy initiatives and roadmap for action ahead.

#### The session shall cover the following topics:

- Insights from the Countermeasure project and Webinar sessions 1-5.
- Integration of dry waste collection in the plastic waste value chain, Resolving Key Barriers to plastic littering and plastics recycling, Commitments and initiatives to Plastics recycling by FMCG Sector.
- Innovations occurring towards plastics substitutes / alternatives and product design regarding conservation in applications of plastics and polymers.
- Development of Regional Model for Plastic leakage scenario for Mekong Region, and Agra, Allahabad in India.
- Status of plastic waste management and policies and amendments and single use plastic ban in different states in India.
- Awareness and perceptions in society regarding plastics value chain and waste issues and prospective methodology for future surveys for behavioural change achievement.
- Available Data aspects and insights, Additional Data Needs, Correlation requirements and Theoretical and Empirical model building dimensions ahead.
- Towards roadmap and strategy for policy measures, industry response and new initiatives for consideration.

#### Expected Outcome:

Recommendations for strengthening application of existing policy measures and countermeasures for marine plastic litter adoption and adaptation in various states of India and identification of potential new policy measures / instruments and project designs for implementation plastics containing products design and robust plastics waste management for achieving circular economy objectives.





## AGENDA WEBINAR 6

### Scenarios to Counter Plastics Litter by Overcoming Barriers and Identifying Enabling Measures

22 May 2020 | 14:30 – 16:00 hrs

**Moderator:** Mr. SP Chandak, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH

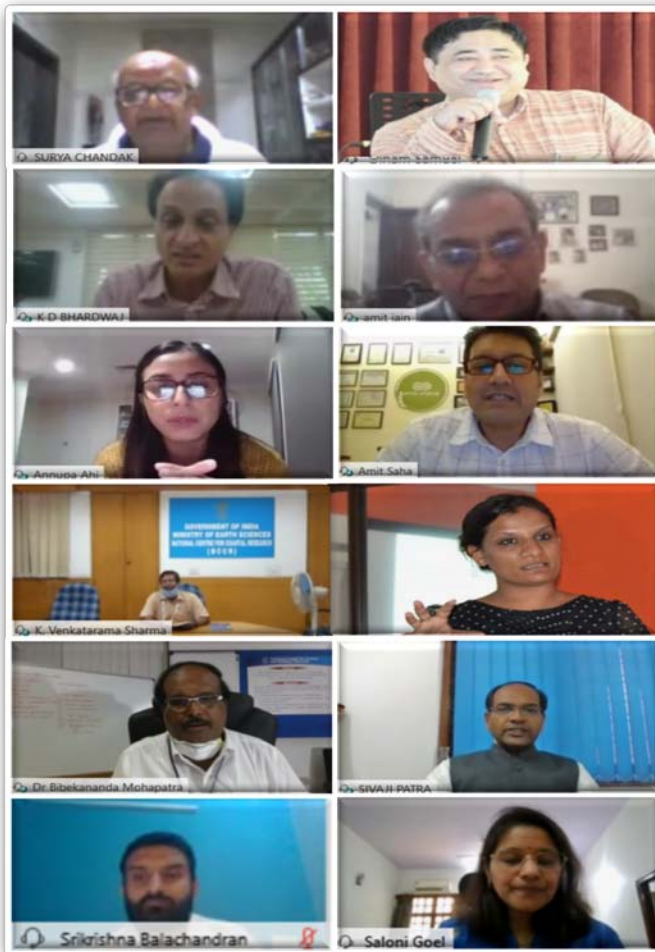
**Coordinator:** Mr. Oinam Samuel, Deputy Director, NPC

Time (hrs)	Theme/Topic	Speaker
14:30 – 14:35	Insights from the Countermeasure Project and Webinar Sessions 1-5	Mr. K D Bhardwaj, Regional Director, NPC
14:35 - 14:45	Methodology and standardization for Plastic Hot spotting & Plastic Leakage Scenario to adopt countermeasures in an urban setting in India	Mr. Amit Jain, Director, IRG System South Asia
14:45 - 14:55	Collection and Channelizing Plastic Bottle Recycling via Deposit Refund System (DRS)	Ms. Annupa Ahi, VP-Business Development, (Asia Pacific), TOMRA Systems ASA
14:55 – 15:05	Innovations Occurring Towards Plastics Substitutes / Alternatives and Product Design regarding Conservation in Applications of Plastics and Polymers	Mr. Amit Saha, Founder & CEO - ProIndia
15:05 – 15:15	Strategies to Fight Plastic Trash-Formulating a Sound National Policy and Robustly Implementing it	Dr. K. Venkatarama Sharma, Scientist-F, NCCR, MoES
15:15 – 15:25	Existing Status of Single use Plastics Bans in India and Recommendations for SUP Policy	Ms. Swati Singh Sambyal, Waste Management Specialist, UN-Habitat India
15:25 – 15:35	Strategy and Facilitation to encourage Co-processing of Plastic Waste in Cement Kiln	Dr. B. N. Mohapatra, Director General, NCCBM
15:35 – 15:45	Plastic Free Rivers and Seas for South Asia	Dr. Sivaji Patra, Sr. Programme Officer, SACEP
15:45 – 16:00	<b>Panel Discussion</b> and <b>Question and Answers</b>	Additional Panel Members: Mr. Srikrishna Balachandran, UNDP Ms. Saloni Goel, UNEP
16:00 – 17:00	<b>POLICY DIALOGUE</b>	

**Proceedings**

**National Policy Workshop Webinar Series on  
“Countermeasures for Riverine and Marine Plastic Litter in India”**

**22 May 2020 | 14:30 – 16:00 hrs**



**UN** environment programme

National Productivity Council

**Counter  
MEASURE**  
FOR PLASTIC FREE RIVERS

**National Policy Workshop (Virtual)**  
on  
**Countermeasures for Riverine and Marine Plastic Litter in India**  
12-22 May 2020

**Webinar Session 6**  
Scenarios to Counter Plastics Litter by Overcoming Barriers and Identifying Enabling Measures  
Date: 22 May 2020 | 14:30 – 16:00 hrs

**Session Coverage**

- Insights from the Countermeasure Project and Webinar Sessions 1-5
- Methodology and standardization for Plastic Hot spotting & Plastic Leakage Scenarios to adopt countermeasures in an urban setting in India
- Collection and Channelizing Plastic Bottle Recycling via Deposit/Refund System (DRS)
- Innovations Occurring Towards Plastics Substitutes / Alternatives and Product Design regarding Conservation in Applications of Plastics and Polymers
- Strategies to Fight Plastic Trash-Formulating a Sound National Policy and Robustly Implementing it
- Existing Status of Single use Plastics Bans in India and Recommendations for SUP Policy
- Strategy and Facilitation to encourage Co-processing of Plastic Waste in Cement Kiln
- Plastic Free Rivers and Seas for South Asia

**Resource Speakers**

- Mr. K. D. Bhardwaj, Regional Director, NPC
- Mr. Anand Jain, Director, IRG System South Asia
- Mr. Annuja Ahi, VP-Business Development, (Asia Pacific), TOMRA Systems ASA
- Mr. Amit Saha, Founder & CEO - ProIndia
- Dr. K. Venkatarama Sharma, Scientist-F, NCCB, MoES
- Ms. Swati Singh Sambyal, Waste Management Specialist, UN-Habitat India
- Dr. B. N. Mohapatra, Director General, NCCBM
- Dr. Sivaji Patra, Sr. Programme Officer, SACEP

**Additional Panelists:**

- Mr. Srikrishna Balachandran, UNDP
- Ms. Saloni Goel, UNEP

**Moderator:**

- Mr. S. P. Chaudhri, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH

**Coordinator:**

- Mr. Osman Samad, Deputy Director, NPC

**Registration Link**  
<https://npcindia.gov.in/NPC/User/unep>

**Partner Agencies**

Development Alternatives

chintan  
environmental research and action group

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**WEBINAR 6**

**Scenarios to Counter Plastics Litter by  
Overcoming Barriers and Identifying  
Enabling Measures**



## WEBINAR 6

### Proceeding

# Scenarios to Counter Plastics Litter by Overcoming Barriers and Identifying Enabling Measures

22 May 2020 | 14:30 - 16:00 hrs

#### Moderator

**Mr. SP Chandak**

*Former Deputy Director, UNEP & Professor Emeritus, BIMTECH*

#### Coordinator

**Mr. Oinam Samuel**

*Deputy Director, NPC*

## INTRODUCTION

In the current plastics era, the problem of riverine and marine litter has emerged as a global concern as plastics leakage has been significant over the decades. To increase plastics and various material circularity aspects, leakage of plastic from the human technosphere needs addressing via countermeasures that would include a spectrum of policy interventions, effective implementation of rules, good depository schemes and economic instruments. Greater scope has arisen for a combination of informal and organized systems to work for collection of plastic waste and recycling arrangements, introducing new product designs to enable recycling and other novel treatment and disposal options, besides promotion and propagation of alternatives including bioplastics.

The objective has been to understand insights from countermeasure project for marine plastic litter in India and reflecting on the need for development of regional plastic leakage model to overcome barriers regarding database construction and analysis. Further exploring policy initiatives and roadmap for action ahead.

## WEBINAR 6 AGENDA



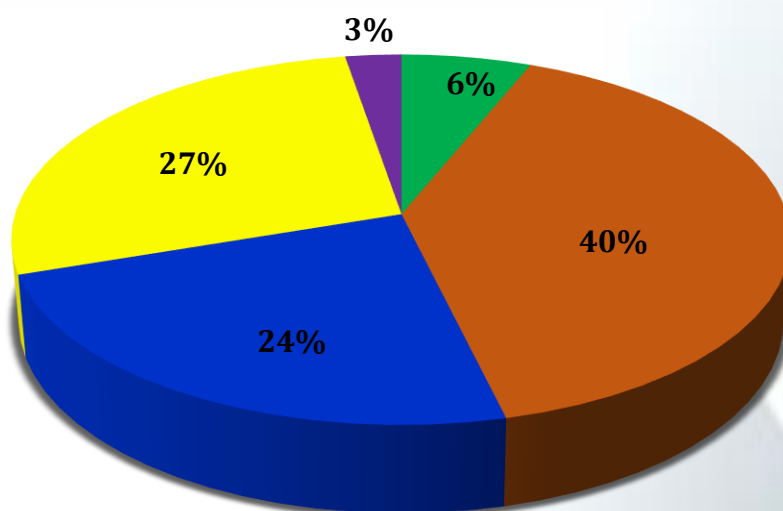


Time (hrs)	Theme/Topic	Speaker
14:30 - 14:35	Insights from the Countermeasure Project and Webinar Sessions 1-5	Mr. K D Bhardwaj, Regional Director,NPC
14:35 - 14:45	Methodology and standardization for Plastic Hot spotting & Plastic Leakage Scenario to adopt countermeasures in an urban setting in India	Mr. Amit Jain, Director, IRG System South Asia
14:45 - 14:55	Collection and Channelizing Plastic Bottle Recycling via Deposit Refund System (DRS)	Ms. Annupa Ahi, VP-Business Development, (Asia Pacific), TOMRA Systems ASA
14:55 - 15:05	Innovations Occurring Towards Plastics Substitutes / Alternatives and Product Design regarding Conservation in Applications of Plastics and Polymers	Mr. Amit Saha, Founder & CEO - ProIndia
15:05 - 15:15	Strategies to Fight Plastic Trash-Formulating a Sound National Policy and Robustly Implementing it	Dr. K. Venkatarama Sharma, Scientist-F, NCCR, MoES
15:15 - 15:25	Existing Status of Single use Plastics Bans in India and Recommendations for SUP Policy	Ms. Swati Singh Sambyal, Waste Management Specialist, UN-Habitat India
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15:45 - 16:00	Panel Discussion and Question and Answers	Additional Panel Members: Mr. Srikrishna Balachandran, UNDP Ms. Saloni Goel, UNEP

## PARTICIPANT PROFILE

The webinar was attended by 700 plus participants as located across 18 countries such as Denmark, Egypt, Ethiopia, Germany, India, Ireland, Malaysia, Netherlands, Norway, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Taiwan, Thailand, United Arab Emirates, United Kingdom, United States of America etc. The participants were from across various sectors (public / private organizations, civil society, academia, embassy, and from across a range of national and multilateral institutions such as UN Organisations, GIZ, WWF, ZSL, World Bank, JICA, SACEP etc). The participant profile details are depicted in **Figure 1**.

**Figure 1: Participant Profile**



- International Organization
- Govt. Department & Public Organization
- Private Organization & industrial Association
- Academia/Researchers
- Civil Society

Sl. No.	Countries Attended
1	Denmark
2	Egypt
3	Ethiopia
4	Germany
5	India
6	Ireland
7	Malaysia
8	Netherlands
9	Norway
10	Pakistan
11	Philippines
12	Saudi Arabia
13	Sri Lanka
14	Taiwan
15	Thailand
16	United Arab Emirates
17	United Kingdom (UK)
18	United States of America (USA)

**Total Attendance**  
**716**

## WEBINAR PROCEEDINGS

The session was opened by a welcome to the moderator Shri S.P. Chandak, former Dy. Director UNEP and Professor Emeritus BIMTECH, and to all the resource speakers, panelists and attendees/participants on behalf of NPC and UNEP by Mr. Oinam Samuel, Deputy Director, NPC.

Shri S.P. Chandak thanked the organizers and briefly reflected on the webinar series and the insights being generated on the project theme and objective of the National Policy Workshop through webinars 1 – 5 and exhorted the speakers/panellists to maintain the momentum and to reflect on various dimensions of the works and towards sharing significant case examples and key recommendations that could guide policy initiatives and thereafter opened the forum for the resource speakers.

## PRESENTATION 1:

### Insights from the Countermeasure Project and Webinar Sessions 1-5 by Mr. K D Bhardwaj, Regional Director, NPC

The first presentation by Mr. K D Bhardwaj, Regional Director, NPC, reflected insights on the counter measure project for marine plastic litter in India, the 4 cities which were chosen for detailed study (namely Agra, Haridwar, Allahabad/Prayagraj and Mumbai) and the approach which was adopted during the execution of the project. Mr. K D Bhardwaj acknowledged the efforts of the partner agencies in this project which were engaged to carry out the perception survey studies and outreach activities as undertaken. He spoke about key activities undertaken and project deliverables.

**Countermeasures Project**

- Project "Promotion of Countermeasures against Marine Plastic Litter in Southeast Asia and India" was launched in 2019 (also named as "Counter MEASURE")
- Aiming to identify a region-based model for monitoring and assessment of plastic leakage and pollution reduction targeting land-based plastic leakage entering waterways
- Funded by the Ministry of Foreign Affairs (MOFA), the Government of Japan
- Implemented by the UN Environment Programme Regional Office for Asia and the Pacific in collaboration with National Productivity Council and local partners Chintan, TERI, and Development Alternative.
- Since October 2019, following key activities have been conducted:
  - Technical consultations and expert group meetings in India has been conducted on the methodology for identifying plastic leakage pathways and emerging know-hows on the science-policy interface on plastic leakage.
  - Data collection and surveys carried out in 4 cities in India: Agra, Prayagraj, Haridwar, and Mumbai.
  - Outreach activities have also been conducted with local partners in India to share findings from local surveys as well as to raise awareness about plastic pollution among citizens.
  - Identified about 50 categories of product based plastic litter at hotspots near rivers Ganga and Yamuna and about 40 types of polymer-based micro-plastics

**Countermeasures Project**

- Project deliverables:
  - Desktop review of plastics and plastic pollution
  - Plastic leakage pathways
  - Counter Measures
- NPC organized the National Policy Workshop through series of the webinar during 12-22 May 2020 (Six on-line sessions)
  - Sessions on
    - Science and technology of plastic pollution assessment,
    - Community perception and behavioural aspects,
    - Plastic waste management through circularity concept,
    - Plastic pollution impact on the riverine and marine ecosystem,
    - Scenario to counter plastic litter
- A specific session on plastic waste generation during COVID 19 spread in India has also been organized on 20<sup>th</sup> May, 2020

**Webinar 1: The Science & Technology of Plastics & Techniques/best practices of plastics pollution assessment and investigation.**

- First webinar was organized on 12<sup>th</sup> May, 2020 (2:30 PM - 5:30 PM)
- Attended by more than 700 participants from 12 countries representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions such as UN Organisations and the World Bank.
- Key highlights:
  - The importance of plastics and various polymers and their applications and concern
  - Need to revisit the behavioural approach to managing plastics including towards segregation and to have a system of well segregated plastic waste collection and recycling initiatives
  - Need to draft a national marine litter policy to control and manage the litter at the land boundary to prevent from entering the marine environment.
  - Importance of a detailed material balance of plastics production and consumption, and constructing a detailed leakage scenario: and Development of a standardized methodology for clean-up exercises for adoption
  - Types of plastic litter identified in 4 cities and efforts ongoing to develop a toolbox on plastic leakage scenario development and the need for constructing a harmonized methodology

**Webinar 2: Community Perceptions and behavioural aspects for plastic management and promotion of countermeasures to address (Riverine and Marine) plastic litter**

- 2<sup>nd</sup> Webinar was organized on 14<sup>th</sup> May, 2020 (2:30 PM - 5:00 PM)
- Attended by more than 450 participants from various countries representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions.
- Key highlights:
  - Plastic leakage scenarios in four cities Prayagraj, Agra, Haridwar and Mumbai developed by NPC using primary and secondary data and field observations
  - Perception surveys and outreach activities carried out by partner agencies, namely, Chintan in Agra, TERI in Mumbai and Development Alternative in Prayagraj and Haridwar
  - Importance of Faith-based Organizations (FBOs) for mass following, linkage to spiritual values and a scientific connect, influencing capacity on lifestyles etc.
  - Insights on recognition of Single Use Plastics (SUPs) and its understanding among the stakeholders
  - Systematic engagement and motivation of youth (middle school, colleges and Scouts and Guides) through game-based learning etc.
  - Education on plastic pollution science in youth which is considered more important than banning plastic items as better management of plastics will be the result.



Mr. K D Bhardwaj highlighted about the National Policy Workshop Webinar Series on Countermeasures for Riverine and Marine Plastic Litter in India during 12-22 May 2020 (six on-line sessions). He further shared key highlights of each webinar.

**Webinar 1:** The Science & Technology of Plastics & Techniques/best practices of plastics pollution assessment and investigation on 12<sup>th</sup> May, 2012

- The importance of plastics and various polymers and their applications and concern
- Need to revisit the behavioural approach to managing plastics including towards segregation and to have a system of well segregated plastic waste collection and recycling initiatives
- Need to draft a national marine litter policy to control and manage the litter at the land boundary to prevent from entering the marine environment;
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**Webinar 3: "Promotion of countermeasures against marine plastic litter in Southeast Asia and India**

3<sup>rd</sup> Webinar was organized on 16<sup>th</sup> May, 2020 (2:30 PM – 5:00 PM)

Attended by more than 700 participants from various countries representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions.

**Key highlights:**

- The importance of plastics product as well as product packaging redesign towards bringing circularity;
- Creating a responsible environment with a social, institutional and economic construct for the WARRIORS – SAFALI SATHIS – largely women towards enabling circularity in the plastic products economy;
- Need to incentivize recyclers to achieve circularity;
- Reverse Vending machine for PET bottles as a solution towards organized segregated waste collection;
- Issuance of plastic credit units as an economic instrument for plastic recyclers for encouraging collection of segregated plastic waste.
- Co-processing is a preferred technology for the disposal of plastic waste and Plastic to Diesel conversion technology
- Case study of implementation of Digital EPR Governance platform in Pune as a solution for Plastic Waste Management

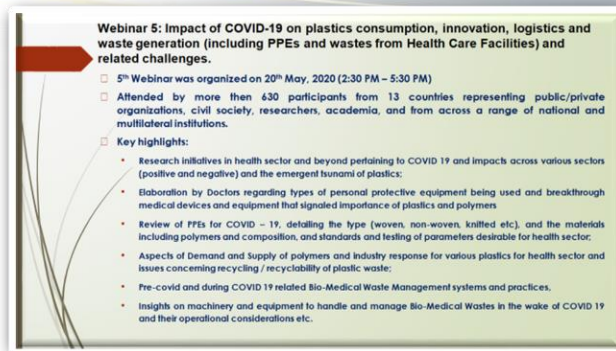
**Webinar 4: Assessment of plastic pollution impact on natural capital and riverine and marine ecosystems needing policy intervention**

4<sup>th</sup> Webinar was organized on 18<sup>th</sup> May, 2020 (2:30 PM – 5:00 PM)

Attended by more than 700 participants from various countries representing public/private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions.

**Key highlights:**

- Snapshots of work undertaken by NPC in respect of microplastic survey in river Yamuna and river Ganga;
- Need to establish health related hazards due to plastic/microplastic on human health with rigorous studies.
- Case study of development of a framework and assessment of the ecosystem services of Ganga River.;
- Methodologies and challenges in microplastic assessment in freshwater, and impact of plastic waste usage in road construction.
- Aspects of Life cycle assessment of plastic products in Plastic value chain
- Overview of Ocean Plastic Tamed into an Opportunity in Circular Economy – OPOCE project being implemented by SINTEF in India, China, Myanmar, Thailand and Vietnam
- Overview of Indo-Norway Marine Pollution Initiative for Developing coherent systems for data collection and analysis for the state of Gujarat



### **Webinar 3: Promotion of countermeasures against marine plastic litter in Southeast Asia and India on 16<sup>th</sup> May, 2020**

- The importance of plastics product as well as product packaging redesign towards bringing circularity;
- Creating a responsible environment with a social, institutional and economic construct for the WARRIORS – SAFAI SATHIS – largely women towards enabling circularity in the plastic products economy;
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- Need to establish health related hazards due to plastic/microplastic on human health with rigorous studies.
- Case study of development of a framework and assessment of the ecosystem services of Ganga River.;
- Methodologies and challenges in microplastic assessment in freshwater; and impacts of plastic waste usage in road construction.
- Aspects of Life cycle assessment of plastic products in Plastic value chain
- Overview of Ocean Plastic Turned into an Opportunity in Circular Economy – OPTOCE project being implemented by SINTEF in India, China, Myanmar, Thailand and Vietnam
- Overview of Indo-Norway Marine Pollution Initiative for Developing coherent systems for data collection and analysis for the state of Gujarat

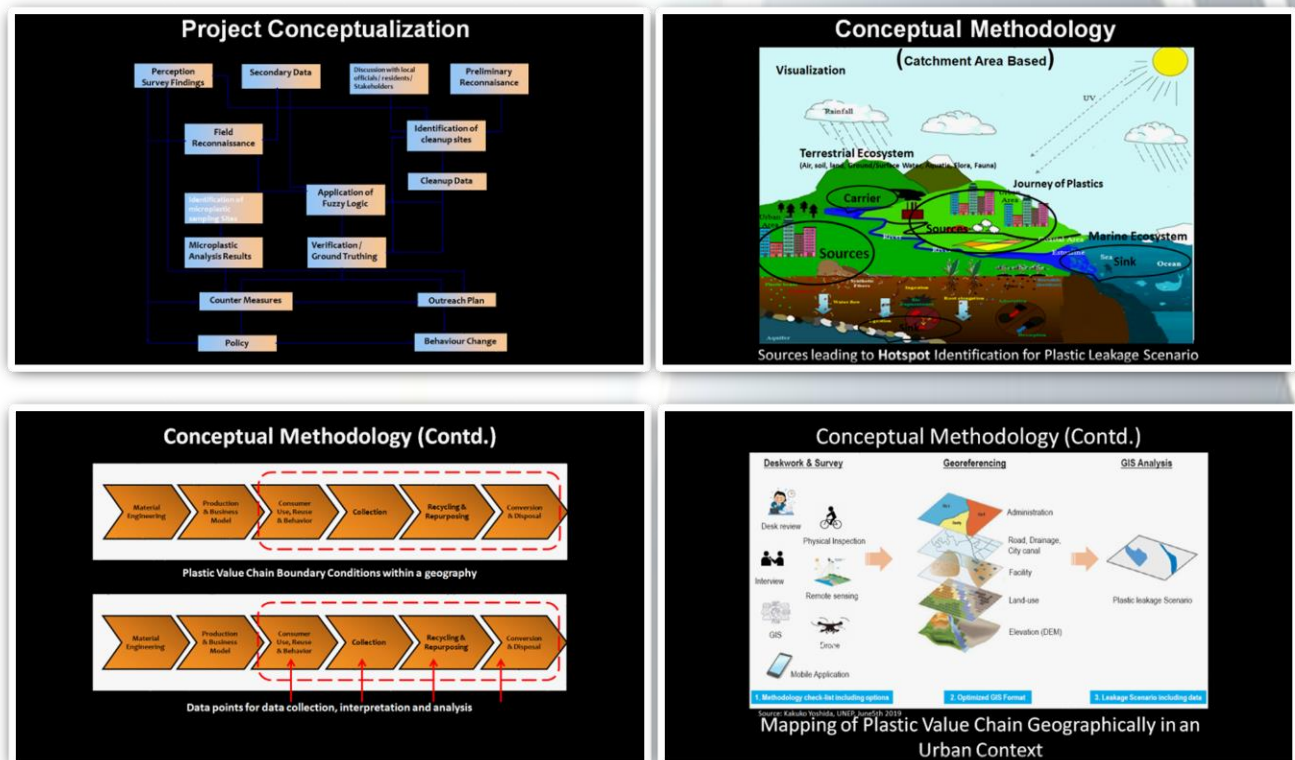


**Webinar 5: Impact of COVID-19 on Plastic Waste Generation (used PPEs and wastes from HCFs) and Upcoming Challenges on 20<sup>th</sup> May, 2020**

- Research initiatives in health sector and beyond pertaining to COVID 19 and impacts across various sectors (positive and negative) and the emergent tsunami of plastics;
- Elaboration by Doctors regarding types of personal protective equipment being used and breakthrough medical devices and equipment that signaled importance of plastics and polymers
- Review of PPEs for COVID – 19, detailing the type (woven, non-woven, knitted etc), and the materials including polymers and composition, and standards and testing of parameters desirable for health sector;
- Aspects of Demand and Supply of polymers and industry response for various plastics for health sector and issues concerning recycling / recyclability of plastic waste;
- Pre-Covid and during COVID 19 related Bio-Medical Waste Management systems and practices,
- Insights on machinery and equipment to handle and manage Bio-Medical Wastes in the wake of COVID 19 and their operational considerations etc.

**PRESENTATION 2:**

**Methodology and standardization for Plastic Hot spotting & Plastic Leakage Scenario to adopt countermeasures in an urban setting in India by Mr. Amit Jain, Director, IRG System South Asia**





The second presentation was made by Mr. Amit Jain, Director, IRG System South Asia. Mr. Amit Jain explained about the conceptual approach, methodology and hotspot identification & plastic leakage scenario (fuzzy based model) undertaken during the conduct of the study as part of the project with NPC and UNEP. He also explained about various tools/techniques adopted, such as (i) Reconnaissance & Perception Survey, (ii) GIS Technique & Fuzzy Approach, (iii) Microplastic Cleanup Assessment (land/ bank), (iv) Microplastic Assessment (river/ water body), (v) Waste Management Data Templates (input/ output, mass balance approach) etc.

He further highlighted the challenges and lessons learned in terms of data availability & data mapping, customization & uniform application of methodology, identification of sampling location, modeling considering length of the river i.e. towns / cities downstream of river – need for phase 2 planning & implementation and application of counter measures.

Mr. Amit Jain concluded his talk by highlighting following recommendations:

- Application of standard assessment methodology (developed under countermeasure project) for scaling up;
- Stage & time wise plastic phase-out to be strengthened across plastic value chain for selected items;
- Creation of drivers of recycled plastics sector
- Support for enhancing plastic segregation by strengthening waste management infrastructure and development of ecosystem (EPR, Instruments, Incentives Up & Down, Pricing)
- Strengthening of reporting, monitoring & evaluation, and regulatory capacity;
- Incentivising innovative product/packaging design to support recyclability
- Application of LCA for scientific environmental evaluation of alternatives.
- Awareness raising & behavior change


### PRESENTATION 3:

#### Collection and Channelizing Plastic Bottle Recycling via Deposit Refund System (DRS) by Ms. Annupa Ahi, VP-Business Development, (Asia Pacific), TOMRA Systems ASA

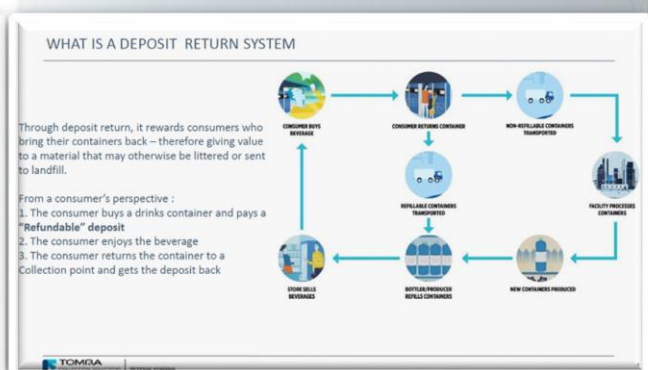
**CONTEXT TO THE TALK**

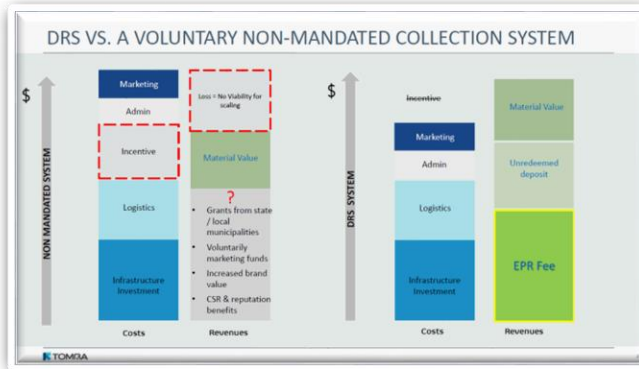
Countermeasures for Riverine and Marine Plastic Litter in India : Collection and Channelizing Plastic Bottle Recycling via Deposit Refund System

There are claims of very high rates of Plastic especially PET recycling in India (largely by informal sector). Therefore why is DRS needed?



Numerous studies show that over 80% of ocean litter derive from land-based sources.  
Hereof, over 30% are beverage container (bottles/cans) or beverage container related (caps/straws) items.





Deposit return systems are proven to drive behavioural change, dramatically reduce littering, and facilitate sustainable recycling outcomes – all in an economically viable way.

- ~98% of deposit containers are collected in Germany
- ~84% of polls show the public are strongly in favor
- Michigan has avoided over \$330m in litter clean-up costs

**TOMRA**

The third presentation was undertaken by Ms. Annupa Ahi, VP-Business Development, (Asia Pacific), TOMRA Systems ASA, who elaborated on the collection and channelizing of plastic bottle recycling via deposit refund system (DRS). She explained about deposit refund system (DRS) and why DRS is needed. She explained that through deposit return, the system rewards consumers who bring their containers back – therefore giving value to it as material that may otherwise be littered or sent to landfill. She narrated from a consumer’s perspective that the consumers buy a drinks container and pays a “refundable” deposit, the consumer enjoys the beverage and the consumer returns the container to a collection point and gets the deposit back.

She reflected that there are claims of very high recycling of plastic, especially PET recycling in India (largely by informal sector), and that there was potential for DRS application. Ms. Annupa Ahi highlighted the EU directive and global shift to DRS. She emphasized that deposit return system are proven to drive behavioural change, dramatically reduce littering and facilitate sustainable recycling outcomes – all in economically viable way. She concluded her presentation by sharing DRS impacts, benefits and keys facts.

**PRESENTATION 4:**

**Innovations Occurring Towards Plastics Substitutes / Alternatives and Product Design regarding Conservation in Applications of Plastics and Polymers by Mr. Amit Saha, Founder & CEO - ProIndia**

**(1) Polymer Innovation**

- Ability to delayer the MLP – CreoSolv by Unilever
- Ability to Replace Aluminium as O2 & Moisture Barrier - EVOH by **Dow Retain** – Compatibilizers
- Nylon & Polyester Busters – Additives from Resin Cos
- Back to PolyOlefins from QuantaFuel
- Bio Compostable Plastics – by many players

**Retain**  
polymer modifier by **Dow**

**CreoSolv Process**

**End-of-life options for BIOPLASTICS**  
– Closing the loop –

Biodegradable & compostable plastic products

Organic recycling

Biorefinement industrial compost plant

**(2) Packaging Harmonisation**

- Harmonization is Happening in Europe why not India
- Monomerization – Single Family Plastic for Multi Layer
- Maximum Inerts upto 8 %
- Moving Away from Polyester & Nylon ( Non Recyclables)
- Moving Away from Aluminium ( EVOH)
- Harmonisation creates single waste stream
- Gulka Industry moved away from Plastic
- Is FMCG waiting for a BAN for plastic use in Sachets

**EUROPEAN PLASTICS PACT**

Bringing together European companies and governments to coordinate their resources and strategies to reduce plastic waste

**COLLECTIVE ACTION BY EUROPEAN PLASTICS PACT**

By 2025, 100% of plastic packaging in Europe will be recycled

By 2030, 100% of plastic packaging in Europe will be recycled

By 2035, 100% of plastic packaging in Europe will be recycled

**KETAN Silver GULKA**



Mr. Amit Sahain his presentation delved on multiple types of innovation towards plastics substitutes such as (i) Polymer Innovation – towards recyclability & biodegradability, (ii) Packaging Harmonization – towards single streaming of flexible, (iii) Delivery & Consumption Innovation – towards lesser use of single use, (iv) EPR Innovation – bringing polluters & conservers together– plastic exchange and (v) Innovation to Commercialization – plastic index for all.

### (3) Delivery Innovation

- ❖ Milk Man delivery in our times
- ❖ Washable & Reusable Containers
- ❖ Common Logistics for Multi brand
- ❖ Excellent COVID – Home Consumption
- ❖ Food Delivery (BC) 15BN plastics PA - Can it be in Reusable Containers
- ❖ Returnable Plastics ( Like returnable Glass ) for Beverages

Plastics Innovation – Design / Substitute / Alternative

### (3) Consumption Innovation

- ❖ NO Secondary Packaging
- ❖ Loose Sales ( like Grains in Big Bazaar )
- ❖ Bring your Own Container

Plastics Innovation – Design / Substitute / Alternative

### (4) Plastic Xchange – Bring Polluters & Preventors together

Who puts out Plastics into Environment

- ❖ PIMBOs
- ❖ Bulk Waste Generators
- ❖ Offices / Malls / Apartments
- ❖ Stores / Delivery / Couriers / Ecom
- ❖ Citizens

Who takes away plastics from Environment

- ❖ Municipalities
- ❖ Cement Companies
- ❖ Waste Management Companies
- ❖ Recyclers
- ❖ Waste Pickers

- ❖ MOU between Stock Exchange and ProIndia
- ❖ Plastic Credit Units ( PCU ) would be generated by Conservers – like recyclers, municipalities, WM Companies
- ❖ PCU would be Required by Polluters
- ❖ PCU would be defined , certified like commodity
- ❖ PCU would be traded at Xchange

Plastics Innovation – Design / Substitute / Alternative

### (5) Plastic Index - Create Common Path – One Index of measurement

- ❖ Awaiting National EPR Framework
- ❖ What's the Target for Recovery & Recycling for PIMBOs
- ❖ Is EPR =
  1. Awareness
  2. Waste Picker Welfare
  3. Actual Recovery & Recycling against Plastic Put Out
  4. None of the Above
  5. All of the Above
- ❖ Can there be One Model for above and each Stakeholder simply replicates the same
- ❖ Benefits of Scale & Scope
- ❖ Can create Plastics Recycling as Industry

**Constructs of the Plastic Index**

The Index is proposed to comprise of the following broad dimensions for capturing data and information:

<b>Plastic Consumption</b> Reducing plastic consumption in production & packaging to gain visibility of total plastic used & what can be substituted	<b>Plastic Waste Management</b> Minimising plastic waste generation and management to leverage opportunities for optimizing cost	<b>Regulatory/Standards/Decree</b> Harmonising EPR (Extended Producer Responsibility) & other initiatives to ensure compliance to current regulations & readiness to future regulations	<b>Accountance</b> Good management practices for limited resources required to ensure effective planning, action & monitoring
<b>Recyclability</b> Use of circular plastics (recycled, recyclable, biodegradable, and design changes) to reduce waste and ensure business continuity	<b>Value Chain Integration</b> Collaborating with suppliers, suppliers and customers (downstream) to build solutions, co-create business and minimise operational risk	<b>Innovation</b> Innovation in production/design, processes and business models to reduce plastic waste and gain an edge over peers	

Plastics Innovation – Design / Substitute / Alternative

Mr. Amit Saha concluded his presentation by giving following remarks:

- ✚ Incineration is NOT Recycling
- ✚ Incineration is Wasteful & Not Resource Efficient
- ✚ Current Practice is due to lack of Collection, Sorting & Recycling Infrastructure
- ✚ We do NOT Lack Ideas – We lack Commitment for Plastics Circularity
  - Plastics to Roads
  - Plastics to Tiles
  - Plastics to Fuel (Pyrolysis)
  - Plastics to Plastics
  - Bottle to Bottle



## PRESENTATION 5:


### Strategies to Fight Plastic Trash-Formulating a Sound National Policy and Robustly Implementing it by Dr. K. Venkatarama Sharma, Scientist-F, NCCR, MoES

**A whole new world of possibilities beckon!**

Page 12



- The Hon'ble Prime Minister of India received the UN Champions of the Earth Award for the year 2018 for India's extensive efforts to beat plastic pollution including an ambitious pledge to eliminate all single-use plastic in the country by the year 2022



Report on International Coastal Clean-up Day, 15 September 2018  
National Centre for Coastal Research (NCCR)  
NIOI Campus, Pallikarai, Chennai - 600 100



Development of Regional Action Plan On Marine Litter

MARINE LITTER IN THE SOUTH ASIAN SEAS (SAS) REGION

Country Report - INDIA

UNEP National Environment Programme/UNEP South Asia Sustainable Environment Programme, NCCR  
Ministry of Earth Sciences, Government of India

STRATEGIES TO FIGHT PLASTIC TRASH – Formulating a sound National Policy and robustly implementing it

The fifth presentation was delivered by Dr. K. Venkatarama Sharma, Scientist-F, NCCR, MoES who emphasized that no legal mechanisms/framework, institutional framework & policies specifically for riverine & marine litter management, even though there are umbrella legislation for marine pollution control & prevention.

Dr. K. Venkatarama Sharma appealed towards a policy needed to be framed to control and manage the litter at the land boundary as it is difficult / impossible to remove the litter once it enters the marine environment and a well coordinated sound National Policy needs to be formulated by involving all concerned stakeholders – Govt, industry, NGOs, people with a clear roadmap of the milestones that have to be met the policy needs to be robustly implemented to achieve the Zero Plastic goal.

He further discussed that many countries do not have in place a national marine litter policy. There are action plans though that attempts to mitigate the problem. Worldwide inputs of marine litter into oceans are increasing despite international, regional and national efforts, essentially this is due to lack of binding international legal instruments, lack of implementation & enforcement of existing regulations & standards and due to lack of awareness among main stakeholders

Dr. K. Venkatarama Sharma concluded his presentation by summing up strategies to fight plastic trash.

**PRESENTATION 6:**

**Existing Status of Single use Plastics Bans in India and Recommendations for SUP Policy by Ms. Swati Singh Sambyal, Waste Management Specialist, UN-Habitat India**

Ms. Swati Singh Sambyal in her presentation highlighted the Central Pollution Control Board (CPCB) Gap Analysis 2019 reports inadequacy in implementation of PWM Rules, 2016. She mentioned that CPCB has recently remarked that states and UTs are not furnishing adequate information regarding plastic waste generation records, creation of state-level advisory bodies, framing of bye-laws, marking and labeling of multi-layered plastic, the number of plastic manufacturing and recycling units within their jurisdiction. The board also rued the fact that there is dearth of concrete preventive and regulatory measures as envisaged under Plastic Waste Management Rules, 2016.

**Status of plastic bans in India**

- More than 20 states have notified a full or partial ban on SUP, Maharashtra being the first.
- Some states like Telangana, UP, Odisha, Maharashtra, Tamil Nadu, and Himachal Pradesh banned plastic bottles and Tetra packs, single-use straws, plastic/Styrofoam tea cups/containers, etc.
- But many like Bihar or Nagaland banned only polythene bags.
- Maharashtra has classified SUPs into three categories—products that are banned, those allowed with EPR and those that are exempted.
  - It has banned plastic carry-bags, plastic & thermoool cutlery and dish/bowl used to package food in hotels, non-woven polypropylene bags, pouches for liquids and decorative materials made from plastics and thermoool.
  - For other SUPs, it has prescribed buy-back schemes as part of the Extended Producers Responsibility (EPR) of companies. It exempts plastic used for packaging medicines.
  - Also, it has allowed the use of compostable plastics for nurseries, horticulture, agriculture and handling of solid waste.

**Challenges associated with the ban in Indian States**

**Lack of efforts from administration to implement the ban:** There has been little action to stop plastic bag manufacturing or transport. Also, administration has not taken any action to stop vendors to dole out plastic bags or to penalise consumers who are taking the banned bags. Even in cases where there has been action, it is for limited time- which meant that the bags vanished from the market for a while, but came back soon.

**Non-availability of alternatives:** There has been very little effort to ensure availability of other materials. Also, lack of support to alternative industry means that they are relatively expensive and hence consumers or vendors do not prefer it.

**Low Public participation:** Community interest and involvement is of paramount importance when it comes to successful implementation of any environmental initiative. Government has failed to initiate behaviour change, though it has been able to create awareness at many levels.

**Stiff resistance from the Plastic industry:** For example, in case of Delhi, the ban was challenged in the court and could not be implemented. In case of bans on single use plastic as well, similar problems have surfaced. The All India Plastic Manufacturers Association contends the ban in Maharashtra has cost manufacturers millions of dollars and tens of thousands of workers their jobs, and the Tamil Nadu Plastics Manufacturing Association has challenged the Tamil Nadu ban in court.

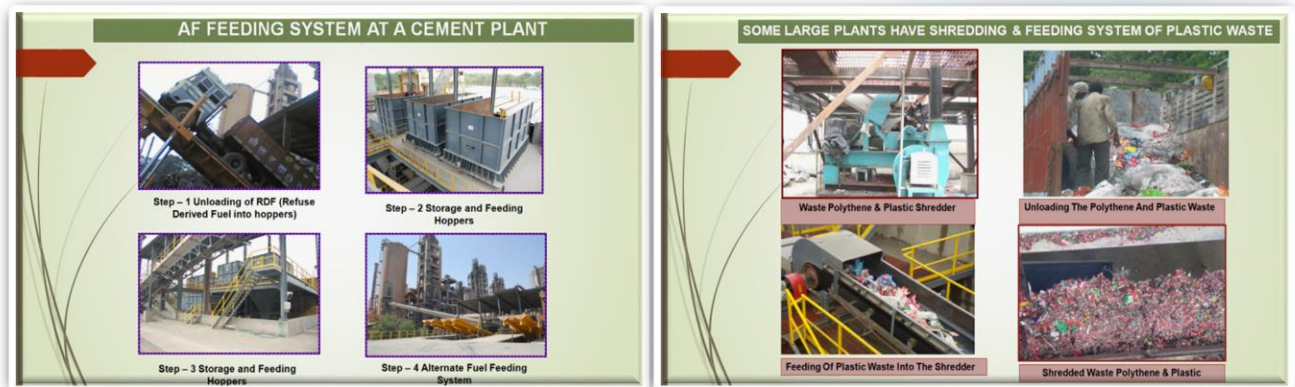
Ms. Swati Singh Sambyal further discussed about the status of plastic bans in India. She shared that more than 20 states have notified a full or partial ban on SUP, Maharashtra being the first. She also addressed various challenges associated with the ban in Indian States and the challenges are (i) Lack of efforts from administration to implement the ban, (ii) Non-availability of alternatives, (iii) Low Public participation and (iv) Stiff resistance from the Plastic industry.

In her recommendations she emphasized the importance of identifying the most problematic SUP items and assesses the extent of their impacts before imposing bans. A clear definition of SUPs in the Indian context is needed. She expressed the need for a national action plan or guidelines for phase-wise banning of plastic items. Plastic items should be classified on the basis of material qualities, recyclability, availability of alternatives, and livelihood security of the informal sector working with them. She further addressed incentivise effective waste management with focus on segregation, collection and recycling, Effective implementation of EPR and Design and circular innovations. In her concluding perspectives she emphasized that the government should invest money in and encourage setting up of ventures that provide sustainable products as an alternative to the non-recyclable products in vogue at present. It should accelerate business-driven innovations and help scale circular economies that focus on systemic stalemates in global material flows so that the need for disposal of materials is delayed.



## PRESENTATION 7:

### Strategy and Facilitation to encourage Co-processing of Plastic Waste in Cement Kiln by Dr. B. N. Mohapatra, Director General, NCCBM



The presentation by Dr. B. N. Mohapatra delved on best option for disposal of plastics co-processing in cement plant, co-processing in cement kilns is recognized as the best waste disposal option, much ahead of conventional land filling and incineration, owing to nil residue after disposal and complete material and energy recovery. The organics, in the wastes, are completely destroyed and the inorganic are immobilized in the clinker matrix, the intermediate product of cement. After the waste is co-processed, it becomes a part of the product and therefore, no liability lies with the waste generators, whatsoever.

He addressed that there are wide range of temperature zones in cement kiln process with different residence times which provide opportunities to fine tune waste management systems appropriately.

In addition he highlighted strategy to encourage co-processing in cement industry as follows:

- Plastic waste specifications to be formulated for co-processing
- Most of the cement plants don't have any shredding facilities. This will require local bodies to establish material segregation & recovery facilities (MSRF) to pre-process the littered plastics
- Some large cement plants have shredding facilities and they can pre-process the incoming segregated waste.
- Implementation of extended producer responsibility
- Strong database of types of plastics and their composition and region wise availability

## PRESENTATION 8:

### Plastic Free Rivers and Seas for South Asia by Dr. Sivaji Patra, Sr. Programme Officer, SACEP

The eighth presentation by Dr. Sivaji Patra, Sr. Programme Officer, SACEP, commenced with the status of marine litter quality data availability statuses in South Asian Sea (SAS) Region.





### The Status of Marine Litter quantity data availability statuses in South Asian Seas (SAS) Region



Country	Quantity Data availability at area/region level	Quantities of Marine Litter Data availability at National Level
<b>Bangladesh</b>	Litter classification information available. But actual quantity not available.	Total Quantity Data not available. But estimation was done by using beach collection data.
<b>India</b>	Status of marine litter indicated 14 segments/regions. But not quantity not available	Quantity Data not available
<b>Maldives</b>	Regional data not available	Quantity Data not available
<b>Pakistan</b>	Regional level classification of marine litter is available. But not quantity data not available	Quantity Data not available
<b>Sri Lanka</b>	Regional level classification of marine litter is available. But same areas quantity data available.	Quantity Data not available



### Marine Litter Issues availability statuses in South Asian Seas (SAS) Region



Country	Ecological Issues	Social Issues	Economic Issues
<b>Bangladesh</b>	No site specific data available to indicate exact issues	General statements but not any quantifiable information	Tourist areas have some impacts but not quantified General statements
<b>India</b>	No country specific information but general impacts information indicated	General statements but country and sites specific social issues not available	General statements but not any quantifiable information
<b>Maldives</b>	No country specific information	General statements and also indicated that it is an emerging issues but country and sites specific social issues not available	Economic impacts due to the marine litter on Maldivian economy are not currently well understood.
<b>Pakistan</b>	No country specific information available	General statements but country and sites specific social issues not available	Indicated Tourism is affecting General statements but not any quantifiable information
<b>Sri Lanka</b>	Little information indicated that coral reefs and mangroves in the certain areas have been affected. But national level information not available	General statements but country and sites specific social issues not available	Indicated that tourism gaining is very high but economic lost and issues due to marine litter to tourism is not specifically

Dr. Sivaji Patra discussed about the quantity data availability at area/regional and national level. He indicated that Litter classification information was available whereas quantity data not available. He also addressed the marine litter issues availability statuses in South Asian Seas (SAS) Region in respects of ecological issues, social issues and economic issues.

He highlighted the special goals to reduce marine litter. He further talked about strategies needed for management of marine litter for SAS regions

Dr. Sivaji Patra addressed the major gaps and challenges for SAS region on managing the marine litter and he concluded his presentation by indicating the following recommendations:

- Establishment of new institutional system SAS region level as well as country level to tackle the marine litter problem
- Assistance to enact specific law or act for each SAS country to properly manage marine litter
- Establishing regional level legal institutional structure to facilitate implementation of international convention, agreement, laws, regulations and treaties
- Introducing urgent project to collect marine litter data in SAS countries
- Preparation and implementation of the proper direct development activities plan to minimize coastal and marine litter in SAS region
- Preparation of research and survey programme to study all aspects of marine litter in SAS region
- Preparation of regulation and enforcement programme for each SAS country to manage the marine litter
- Preparation of country specific education and awareness programme to manage marine litter
- Amending existing instruments to narrow exceptions and clarify enforcement standards
- Establishment of comprehensive national marine litter programmes

## **SALIENT FEATURES OF WEBINAR 6**

The session and presentations highlighted a range of issues and the following aspects:

- Application of standard assessment methodology (developed under countermeasure project) for scaling up;
- Stage & time wise plastic phase-out to be strengthened across plastic value chain for selected items;
- Creation of drivers of recycled plastics sector
- Support for enhancing plastic segregation by strengthening waste management infrastructure and development of ecosystem (EPR, Instruments, Incentives, Pricing)
- Strengthening of reporting, monitoring & evaluation, and regulatory capacity;
- Incentivising innovative product/packaging design to support recyclability
- Application of LCA for scientific environmental evaluation of alternatives.
- Awareness raising & behavior change
- Collection and channelizing plastic bottle recycling via deposit refund system (DRS).
- Deposit refund system has proven to drive behavioural change, dramatically reduce littering and facilitate sustainable recycling outcomes – all in economically viable way.
- Multiple types of innovation towards plastics substitutes such as (i) Polymer Innovation – towards recyclability & biodegradability, (ii) Packaging Harmonization – towards single streaming of flexible, (iii) Delivery & Consumption Innovation – towards lesser use of single use, (iv) EPR Innovation – bringing polluters & conservers



together– plastic exchange and (v) Innovation to Commercialization – plastic index for all.

- A policy needs to be framed to control and manage the litter at the land boundary as it is difficult or impossible to remove the litter once it enters the marine environment and a well coordinated sound National Policy needs to be formulated by involving all concerned stakeholders – Govt, industry, NGOs, people with a clear roadmap of the milestones that have to be met the policy needs to be robustly implemented to achieve the Zero Plastic goal.
- Importance of identifying the most problematic SUP items and assesses the extent of their impacts before imposing bans. A clear definition of SUPs in the Indian context is needed. The need for a national action plan or guidelines for phase-wise banning of plastic items. Plastic items should be classified on the basis of material qualities, recyclability, availability of alternatives, and livelihood security of the informal sector working with them.
- Incentivise effective waste management with focus on segregation, collection and recycling, Effective implementation of EPR and Design and circular innovations.
- The government should invest money in and encourage setting up of ventures that provide sustainable products as an alternative to the non-recyclable products in vogue at present. It should accelerate business-driven innovations and help scale circular economies that focus on systemic stalemates in global material flows so that the need for disposal of materials is delayed.
- The option exists for disposal of plastics via co-processing in cement plant, co-processing in cement kilns is recognized as a good waste disposal option, much ahead of conventional land filling and incineration, owing to nil residue after disposal and complete material and energy recovery. The organics, in the wastes, are completely destroyed and the inorganic are immobilized in the clinker matrix–the intermediate product of cement. After the waste is co-processed, it becomes a part of the product and therefore, no liability lies with the waste generators, whatsoever. Further, wide range of temperature zones in cement kiln processes exist with different residence times which provide opportunities to fine tune waste management systems appropriately.
- Plastic waste specifications to be formulated for co-processing
- Most of the cement plants don't have any shredding facilities. This will require local bodies to establish material segregation & recovery facilities (MSRF) to pre-process the littered plastics and that some large cement plants have shredding facilities and they can pre-process the incoming segregated waste.
- Implementation of extended producer responsibility
- Strong database of types of plastics and their composition and region wise availability
- Establishment of new institutional system SAS region level as well as country level to tackle the marine litter problem
- Assistance to enact specific law or act for each SAS country to properly manage marine litter
- Establishing a regional level legal institutional structure to facilitate implementation of international convention, agreement, laws, regulations and treaties
- Introducing urgent project to collect marine litter data in SAS countries



- Preparation and implementation of the proper direct development activities plan to minimize coastal and marine litter in SAS region
- Preparation of research and survey programme to study all aspects of marine litter in SAS region
- Preparation of regulation and enforcement programme for each SAS country to manage the marine litter
- Preparation of country specific education and awareness programme to manage marine litter
- Amending existing instruments to narrow exceptions and clarify enforcement standards
- Establishment of comprehensive national marine litter programmes

### **KEY QUESTIONS RAISED BY ATTENDEES / PARTICIPANTS**

The session was concluded by answering of a series of questions by the speakers and panellists that were put up by several participants in the workshop.

### **ENCLOSURES:**

- **Press Release (s)**
- **Programme Agenda**
- **Session Flyer**
- **Concept Notes**
- **Presentation by each resource speaker**



## PRESS RELEASE

23 May 2020

National Productivity Council, under DPIIT, Ministry of Commerce and Industry, Govt. of India, has organized the National Policy Workshop through a series of webinars during 12-22 May 2020 comprising of six on-line sessions as part of the UNEP led project “Promotion of Countermeasures against marine plastic litter in Southeast Asia and India”, funded by the Govt. of Japan. The Webinar - 6 on theme ‘Scenarios to Counter Plastics Litter by Overcoming Barriers and Identifying Enabling Measures’ as part of the National Policy Workshop on Countermeasures for riverine and marine plastic litter has been organised on 22 May 2020 during 14.30 – 16.00 hrs followed by a high level online policy dialogue on the subject till 17.30 hrs.

The Webinar 6 via eight insightful presentations highlighted the following aspects (a) Revisiting the essence of Webinars 1 to 5, whereby reflecting on Science and Technology of Plastics and recognizing the importance and value of plastics as well as of the plastics pollution problem and its assessment and investigation methodology developments towards a toolbox with use of GIS and mapping techniques and fuzzy logic etc, and importance of national marine litter policy and related initiatives; Significance of material balance of plastics across value chain and addressing the leakage scenarios via various types of hotspots and undertaking detailed macroplastics and microplastics assessments and their correlation; Engagement in outreach activities and encouraging behaviour shifts in utilization and management of Single Use Plastics (SUPs) by suitably defining and addressing the phase out and appropriate substitution etc by involving suitable national / local policy measures and application of by-laws as per specific contexts, and by educating / motivating / incentivising change to check the instinct to litter; identifying and promoting a spectrum of plastics circularity initiatives and case examples and new range of innovations in this regard and creating a responsible environment and capacity for recycling; Encouraging and enabling Extended Producer Responsibility ethic and related initiatives and models; strengthening and harmonizing methodologies of macro-plastics, microplastics assessments and regarding impact assessments from plastics and their monitoring and evaluation nationally/regionally/internationally; recognizing the emergent challenge from COVID – 19 and the dynamics in plastics products consumption and disposal, including as a range of PPEs, and the issues of biomedical and infectious waste management challenges in health care facilities and systems and at and from locations such as households / quarantine homes / laboratories etc., following and capacitating the application /adoption and practice of suitable guidelines with due innovations, standards and protocols / testing and innovation space and utilization of appropriate equipment; (b) Use of data and modelling techniques for plastics leakage scenario construction and facilitating strengthening of monitoring, evaluation and regulatory capacity alongside the drivers of recycling in plastics sector and encouraging LCA across plastic products and polymer streams; (c) Collection and channelizing plastic bottles via Deposit Refund Systems, and other plastics products/litter components via appropriate circularity models / options including co-processing etc and the regional contexts; (d) Encouraging, facilitating and adopting innovations from the point of view of substitutes/alternatives, designs, processes etc, including innovations in polymers/packaging/Delivery/Consumption domains and exploring and adopting plastic Xchange and a plastic index of measurement; (e ) shaping a national plastics riverine and marine litter policy engaging spectrum of

stakeholders and arresting plastics on land as well as checking land and ground water pollution from plastics and developing necessary instruments; (f) Reviewing status of SUP related bans in India and public and industry participation / response and addressing the data gaps, the local contexts, the importance of marking and labeling of plastics, and enabling measures towards a national action plan recognizing material qualities, recyclability, availability of alternatives, and livelihood security of the informal sector working with them; (g) Understanding and generation of quantitative data and qualitative insights in the South Asian region regarding marine litter in the context of SACEP and adopting strategies in the SAS region to establish regional institutionalized structure to implement international conventions, agreement, laws, regulations and treaties on marine litter and undertake suitable projects to address the marine litter problem in a cooperative arrangement.

The webinar was attended by 700 plus participants as located across 18 countries representing public / private organizations, civil society, researchers, academia, and from across a range of national and multilateral institutions such as UN Organisations and the World Bank. It is indicative that the Webinar series that concluded on 22<sup>nd</sup> May 2020 has been highly appreciated by participants and attracted attention from a wide range of stakeholders.

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# **POLICY DIALOGUE**

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## PRESS RELEASE

22 MAY 2020

National Productivity Council under DPIIT, Ministry of Commerce and Industry is organizing an online high-level Policy Dialogue session, to be chaired by the Secretary, Ministry of Environment, Forest and Climate Change, including officials from DPIIT, MoC&I, Ministry of Jal Shakti, MoHUA, NITI Aayog, AIIMS and international organizations such as UNEP, UNDP, UNIDO and SACEP and Royal Embassy of Norway from 4 to 5.30 PM on 22 May 2020.

Drive the recycled plastics sector through green procurement, incentive scheme for eco-innovative plastic products, financial support for R&D in packaging, facilitating micro plastics sampling, a mechanism to control plastic waste in COVID 19 scenario and international experiences and countermeasures against marine and riverine plastic littering are few of the points to be discussed by high ranking policymakers in the Policy Dialogue session. The session is open to all interested stakeholders who can register at <https://www.npcindia.gov.in/NPC/User/unep>

In order to identify a region-based model for monitoring and assessment of plastic leakage and pollution reduction targeting land-based plastic leakage entering waterways such as rivers and canals or drainages to the sea, one-of-a-kind study by NPC identified about 50 categories of product based plastic litter at hotspots near rivers Ganga and The Yamuna and about 40 types of polymer-based micro plastics in these rivers. In order to disseminate findings, NPC under DPIIT, Ministry of Commerce and Industry, Govt. of India organized the National Policy Workshop through a series of the webinar during 12-20 May 2020 comprising of five on-line sessions. This workshop is part of the UNEP lead project "Promotion of countermeasures against marine plastic litter in Southeast Asia and India" funded by the Govt. of Japan. The sixth webinar starting at 2.30 PM on 22 May 2020 with about 8 technical presentations on scenarios to counter plastic litter will precede the policy dialogue session and will serve as the basis for policy discussions.

Sh. Arun Kumar Jha, DG, NPC encourages all interested organizations to join the session tomorrow keeping in view the national significance of the subject.

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## AGENDA

## Policy Dialogue

## Countermeasures for Riverine and Plastic Litter

22 May 2020 | 16:00 – 17:30 hrs

Moderator: Mr. SP Chandak, Former Deputy Director, UNEP &amp; Professor Emeritus, BIMTECH

Coordinator: Mr. K D Bhardwaj, Regional Director, NPC

Time (hrs)	Theme/Topic	Speaker
16:00 – 16:05	Brief Introduction of Panelists	Mr. S. P Chandak, Moderator
16:05 – 16:07	Opening Remarks	Dr. Atul Bagai, Head, UNEP India
16:07 – 16:12	Countermeasure Project Outcome and Policy Recommendations	Ms. Saloni Goel, UNEP
16:12 – 16:17	UN Vision for Marine Plastic Litter in India	Ms. Shoko Noda, Resident Representative in India, UNDP
16:17 – 16:22	Vision for Marine Plastic Litter in South Asia	Dr. Abas Basir, Director General, SACEP, Colombo, Sri Lanka
16:22 – 16:27	UNEP ROAP Vision and Areas of Work on Marine Plastic Litter	Dr. Dechen Tsering, Regional Director, UNEP, Bangkok, Thailand
16:27 – 16:37	Session Chair Statement	Mr. C K Mishra, Secretary, MoEF&CC, Gol
16:37 – 17:27	Open Panel Discussion on roadmap and strategy for addressing plastic pollution in riverine and marine ecosystem  (Moderated by Sh. S P Chandak and Mr. Amit Jain, Chief Technical Adviser)	<b>Panelists/Guests</b> <ul style="list-style-type: none"> <li>• Mr R. P. Gupta, Special Secretary, NITI Aayog and Secretary Designate, MoEF&amp;CC, Gol/ Mr Sudhir Kumar, Adviser, NITI Aayog</li> <li>• Dr. Arabinda Mitra, Scientific Secretary, Gol</li> <li>• Mr. Shiv Das Meena, Chairman, Central Pollution Control Board (CPCB)</li> <li>• Mr. Rene Van Berkel, UNIDO, Representative, Regional Office India</li> <li>• Mr. Rajiv Ranjan Mishra, Director General, National Mission for Clean Ganga, MoJS, Gol</li> <li>• Prof (Dr). Randeep Guleria, Director, AIIMS</li> <li>• Ms. Sumita Dawra, Joint Secretary DPIIT, MoC&amp;I Gol</li> <li>• Mr. V. K . Jindal, Joint Secretary, MoHUA, Gol</li> <li>• Ms. Camilla Dannevig, Counsellor, Royal Embassy of Norway, New Delhi</li> <li>• Ms. Kakuko Nagatani-Yoshida, Regional Coordinator for Chemicals, Waste, Air Quality, UNEP, Bangkok</li> <li>• Mr. A. K. Jha, Director General, NPC</li> </ul>
17:27- 17:30	Vote of Thanks	Mr. A. K. Jha, Director General, NPC

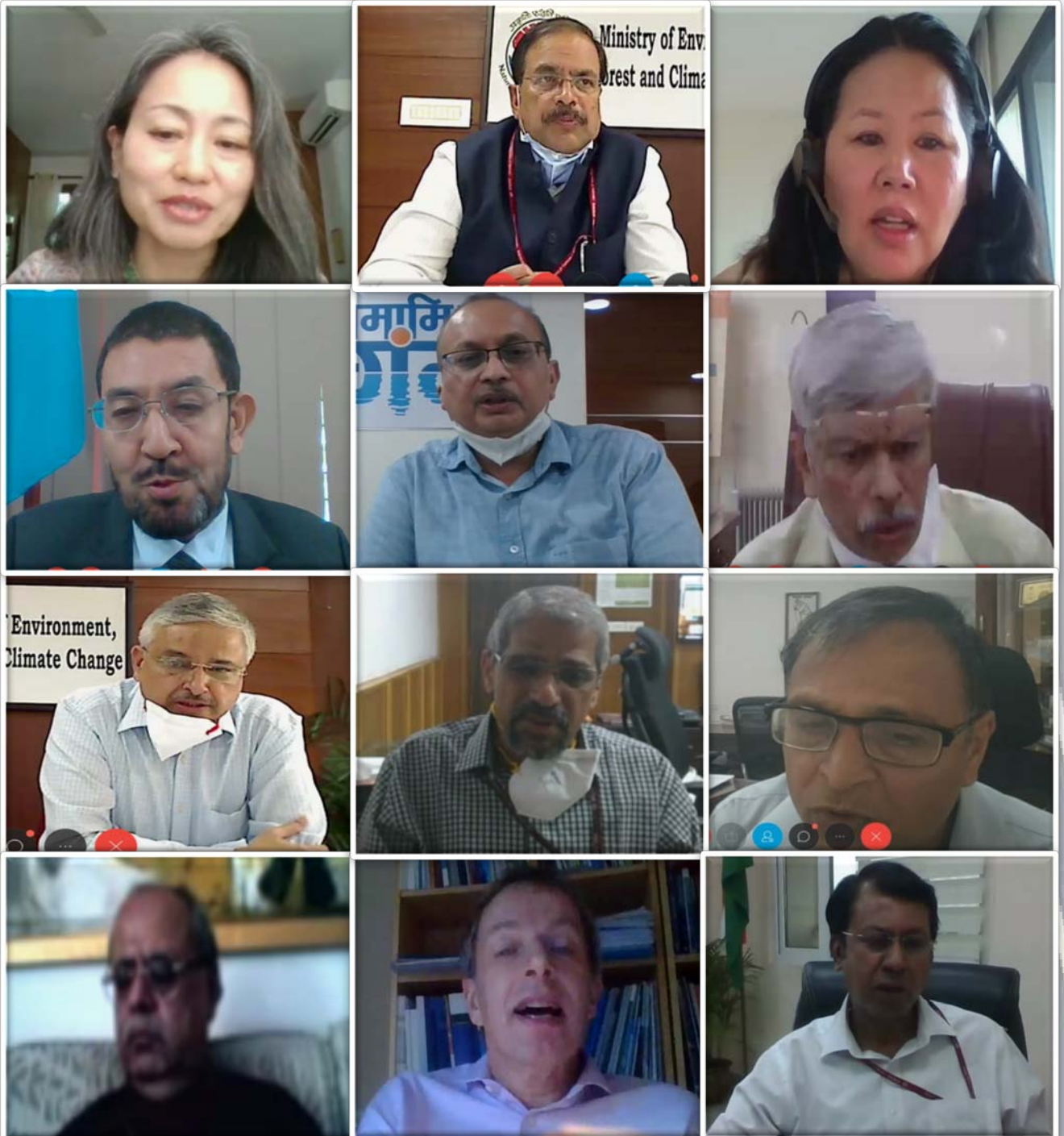




## POLICY DIALOGUE

### Countermeasures for Riverine and Marine Plastic Litter in India

22 May 2020 | 16:00 – 17:30 hrs





## PROCEEDINGS – POLICY DIALOGUE

22 May 2020 | 16:00 – 17:30 hrs

National Productivity Council under DPIIT, Ministry of Commerce and Industry, Govt. of India and United Nations Environment Programme (UNEP) organized an online high-level Policy Dialogue session on 22nd May, 2020, with the chief guest being Mr. C K Mishra, Secretary, Ministry of Environment, Forest and Climate Change, Govt of India. This session was attended by about 400 participants on-line. The panel deliberated on priority policy areas for reducing marine litter, need for sound scientific research and innovations to combat plastic litter, plastic litter parameters that need to be monitored, concerns due to increased plastic waste generation from COVID-19 pandemic, and supportive policies and need for international technical support.

Mr. C. K. Mishra, Secretary, MoEF&CC emphasized on two-pronged approach focusing on technology and resource provision to tackle plastic litter problem and stated that marine litter problem could be resolved by collective efforts through national strategy. Dr Dechen Tsering, Regional Director, UNEP, Bangkok indicated that the pilot assessment on countermeasures in Agra, Prayagraj, Haridwar and Mumbai was just a start and detailed assessment in other cities had to be undertaken. Scientific Secretary to GoI Dr. Arabinda Mitra emphasized on having a robust database, R&D roadmap, and a holistic approach to address marine litter. Dr Abas Basir, DG, South Asia Cooperative Environment Programme, Colombo highlighted that there was a lack of resources, data, research, manpower, and dedicated legal framework, and weak institutional mechanism and that a dedicated marine litter cell could encourage scientific interventions and public-private partnerships.

Mr. Rajiv Ranjan Mishra, DG, National Mission Clean Ganga (NMCG) asked for sensitizing and educating people to reduce plastic litter along the rivers. Making a call for joining voices, hearts, networks to ensure that cities and oceans are clean and thriving, Ms. Shoko Noda, Resident Representative in India, United Nations Development Programme(UNDP) said marine life affected the nature of the planet and that UNDP was deeply committed to strengthening plastic waste management through adequate infrastructure in partnership with the private sector, government and civil society. AIIMS Director Prof (Dr.) Randeep Guleria stressed management strategies to tackle plastic waste in COVID era and awareness generation on proper disposal. United Nations Industrial Development

Organization (UNIDO) Representative, Mr. Rene Van Berkel said marine plastic litter required a sharp focus on circular economy solutions with a consistent policy framework crossing environment, industry, technology and consumer policies. Central Pollution Control Board (CPCB) Chairman, Mr. Shiv Das Meena informed that CPCB had developed Guideline towards handling biomedical waste which included plastics generated from COVID- 19 situation. Mr V.K. Jindal, JS, MoHUA said that efficient solid waste management in the cities was most crucial and ban on specified items of single use plastic, implementation of Extended Producers Responsibility and synchronization of industrial policy on the use of plastic in cement plants/ road construction was prerequisite for the reduction in marine litter in India. Niti Aayog adviser Mr. Sudhir Kumar Sirohi stated that marine litter was a result of the linear economy and there was a need to work on reverse logistics systems.

UNEP-Bangkok Coordinator for Chemicals, Waste and Air quality Ms. Kakuko Nagatani-Yoshida shared valuable policy insights on the sector and product-specific policies and data sharing. She also spoke of plastic waste management challenges due to COVID-19. Royal Norwegian Embassy Counsellor Ms. Camilla Dannevig said that the Indo-Norway Marine Pollution Initiative could foster fruitful discussion between stakeholders, and relevant projects could be initiated. Dr Atul Bagai, Head, UNEP India stated that UNEP's project on Counter MEASURES against Marine Plastic Litter in South East Asia was a unique project that brought together technical and outreach components to develop a ground-level understanding of the plastic waste generation and leakage into water bodies like rivers and drains, which finally reach oceans. The project developed a comprehensive methodology for future studies and reached out to a wide spectrum of stakeholders to enhance action. He hoped that findings of this project would be integrated into the National Roadmap on Marine Plastic Litter. Mr. Arun Kumar Jha, Director General, NPC vouched that NPC would continue to disseminate the project findings and work towards developing future strategies.

This session was part of the UNEP led project "Promotion of countermeasures against marine plastic litter in Southeast Asia and India" funded by the Govt. of Japan. The policy recommendations that emerged from the session will be circulated to all stakeholders in due course of time.

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## SUMMARY OF POLICY DIALOGUE SESSION

22<sup>nd</sup> May 2020

A circular economy is restorative and regenerative by design. Plastics can be made to contribute towards a circular economy, helping to achieve a more sustainable and resource efficient future for all by simultaneously retaining the value of plastics in the economy, and minimising leakage into the natural environment. To drive real change towards a circular economy for plastic, there is a need to reduce unnecessary plastic items, innovate to ensure that the plastics that is needed are reusable, recyclable, or biodegradable / compostable and that it circulates in the economy and do not leak into the natural environment. For this, Industry players from across the plastics value chain have to come together to implement appropriate product and business process innovations.

In this regard, National Productivity Council under DPIIT, Ministry of Commerce and Industry in association with United Nations Environment Programme (UNEP) organized an online high-level Policy Dialogue session, inviting as Chief Guest Sh. C. K. Mishra, Secretary, Ministry of Environment, Forest and Climate Change from 4 to 5.30 PM on 22 May 2020 with about 400 participants / attendees on-line.

The panel deliberated on priority policy areas for reducing marine litter, need for sound scientific research and innovations to combat plastic litter, plastic litter parameters that need to be monitored, concerns due to increased plastic waste generation from COVID-19 pandemic, and supportive policies and need for international technical support. The Policy-dialogue session was moderated by Mr. S. P. Chandak, Former Deputy Director, UNEP & Professor Emeritus, BIMTECH . The Chairman of the session being Shri C. K. Mishra, Secretary, MoEF&CC, GoI. The objective of the session was to **deliberate on roadmap and strategy for addressing plastic pollution in riverine and marine eco-system.**

**The session started with introduction on countermeasure project.** The project is being implemented in Mekong region and India. In India, it is being implemented in (a) three cities of Ganga-Yamuna Basin i.e Agra, Haridwar and Allahabad and (b) a coastal city i.e. Mumbai. The project has been able to accomplish the following:

- Evolving / deliberating a Region Based Approach for mapping plastic leakage hotspots and scenarios
- An SOP and application of a developed Methodology for conducting the study (Macroplastics assessments via clean – ups), including referencing other initiatives
- Microplastics sampling and analysis (towards snapshots of River Ganga and Yamuna)
- Technical and outreach capacity for extension in other regions
- Outreach material in English, Vernacular Languages, Braille- video, audio, print

- Countermeasures and recommendations for policy

The august panelists in the Policy – dialogue session are enumerated at Annexure 1.

As part of the policy dialogue session the following set of policy recommendations emerged and were evolved.

### **1. Science & Technology and Plastics Pollution assessments / investigation**

- Development of a standardized methodology for data generation in waste management chain and plastic value chain (including Macroplastic polymers in litter and reverse logistics) and constructing a database and information dashboard / repository
- Development of capacity for detailed assessment of plastic leakage in India
- Study to Standardize methodology on microplastics research, with clear objectives and to assess microplastics contamination and their distribution in Indian rivers, associated wetlands, lakes and others
- Study to evolve Standardised process for macroplastic assessment and collation of all data
- Studies to Understand the fate and behaviour of microplastics within the water column, including the effects of fragmentation and bio-fouling (Modelling), Determining microplastic uptake by biota affecting the marine food-web and expand the use of sentinel species (e.g. bivalves) in detecting microplastic abundance. (Toxicology), assess the impact i.e. mortality, morbidity and/or reproduction of ingested microplastics and leached plastic additives on marine biota, and their effect on the food-chain (Experiments work).
- Robust monitoring of groundwater for toxic chemicals associated with plastics as well
- Integration of studies conducted by isolated research institutions and agencies onto one platform
- Support for enhancing research capacity and procurement of analytical equipment for institutions and laboratories
- Undertaking Policy interventions to meet the challenge of making recycled plastic economical and comparable to virgin plastic
- Introduction of multiple stream collection systems allowing separated collection of plastic recyclables;
- Creation of incentives for better product and plastics design (e.g. design for reuse and recycling), such as through better designed extended producer responsibility, product stewardship and deposit-refund systems;
- Support for R&D for improved plastics management systems and the sustainable design of plastics (more easily recyclable or more easily biodegradable for example), working in close partnership with industry;
- Policy level countermeasures to prevent manufacture and sale of certain plastic products which generate waste that are difficult to treat.
- There is a need to draft a national marine litter policy to control and manage the litter at the land boundary to prevent litter from entering the marine environment

- Formulation of Standards and regulations for micro and macro plastics assessments in riverine & Marine system

## **2. Outreach**

- Using scientific evidence and knowledge to bridge knowledge gaps and nudge behavior change
- Overcoming of knowledge gaps (such as about polymers in non-woven bags etc), definition of SUPs, labeling of plastic polymers in products and packaging
- Language of Communication- be broadbased including in English, Vernacular, Pictorial, Audio-Visual, Braille
- Widen collaboration for disseminating message- social influencers (faith leaders, tourist guides, NSS volunteers, educational institutions), media etc.
- Popularise a hierarchy of plastic waste management steps
- Civil society led clean-ups for deepening community sensitization to be continued
- Government schemes such as SBM, Namami Gange to be synergized with Municipal level waste management system and initiatives such as UNEP countermeasures project
- Affordable alternatives to be brought to compulsory use in government offices, Ganga Sabha establishments, Municipal institutions, main markets in the cities
- Higher fines on littering and open dumping to induce behavior change
- Creation of consumer education and awareness campaigns (concerning the environmental benefits of recycled plastics) in order to stimulate demand for products containing recycled plastic

## **3. Circular Economy**

- Towards recycling and Circularity to replicate good models, and support economic and social viability for scale up via economic instruments, structural and financial frameworks and good practices that also need to be documented and disseminated
- Use of recycled plastic in products to be encouraged and ecofriendly product features to be highlighted
- Regulation on the use of plastics and study on the life cycle analysis of packaging materials including plastics in relation to the prohibition on the use of Non-environmentally acceptable products and packaging materials.
- Economics of plastic recycling needs to be examined in greater detail with focus, among others, on 'economics of pick ability' so as to not only increase the picking rate (particularly of film plastic) but also open up additional job opportunities.



- Making mandatory and ensuring compliance by all manufacturers and recyclers of plastics to label correctly and effectively the polymer types amongst the 7 categories delineated, as well as reflecting additional details such as fillers and chemical additives utilized in the said plastics based products manufactured for the market. This shall enable efficiency in recycling systems and suitable guidelines be prepared as well.
- In case of plastic bans, specific SUP plastic bans need to cover both production and use. Additionally, they need to be strengthened with robust regulatory, reporting, and monitoring capacity.
- Prioritise and Incentivise Innovative Product & Packaging Design to support recyclability- easy dismantling, replaceable/changeable parts for enhanced life, alternatives to hazardous additives, compostable/re-usable/recyclable product packaging, labelling.
- Policy interventions that aim to level the playing field between virgin and recycled plastics or support the market for recycled plastics. They include:
  - Taxes on the use of virgin plastics or differentiated value added taxes for recycled plastics or plastic products;
  - Introduction of recycled content standards, targeted public procurement requirements, or recycled content labeling; and
- Policy interventions towards Maintaining right quality of recycled plastics through the following
  - Creation of certification standards for recycled plastics;
  - Creation of requirements and facilities to collect and recycle all types of plastic products;
  - Facilitation of better coordination and communication across the plastics value chain, including through the promotion of chemical information systems; and
  - Restrictions on the use of hazardous additives in plastics manufacturing.
- Introduction of more ambitious recycling rate targets and harmonization of the methods used to calculate these rates

#### **4. Waste Management**

- EPR based regulatory mechanism to be evolved and implemented, including facilitation / encouragement of suitable financing models
- Develop Incentives and Mechanisms for collection of Plastic Waste for Integration into a Value Chain, for example EPR, Deposit Refund Schemes, Garbage Cafes, Kiosks (providing mobile recharge facility), Plastic exchange ( trading in

compliance credit) etc., polymer type labeling in plastic products and components and encouraging product composition declaration

- Encouraging development of financing instruments to take forward Extended Producer Responsibility as well as in a contextual sense Extended Consumer Responsibility (whereby at least 7 category level segregations be enabled via consumer efforts and separate recycling value chains are strengthened and made efficient), all of which to parallelly enable both formal and informal systems to gel well and achieve mutually symbiotic efficiencies in plastics production, reuse and recycling arrangements. The financial instruments could include different incentives built into various initiatives, be it R&D and stock market and material exchange arrangements for the plastics moved
- Increased stringency of landfill and incineration fees to better reflect the full social cost of these activities, and where feasible primarily non recyclable plastics be directed to such treatment
- Effective waste management infrastructure
- Regular monitoring and evaluation network to inform local, national and regional action.

## **5. COVID – 19 and Waste Management Systems**

- Development of appropriate strategy and guideline for the collection and handling of waste materials from households and quarantine facilities with positive or suspected COVID-19 patients. This may include Segregation at source and separate collection mechanism should be pushed to prevent the further spread of virus. The collected waste should be labelled to avoid mixing with MSW.
- The reusability and recyclability of PPE have to be enhanced and waste management has to be considered as a critical design in healthcare sector.
- Enhance the design principles in waste management and improve the incentives for recycling of PPE.
- Inventorisation on waste generation and disposal practices adopted during pandemic like COVID 19 and monitoring and evaluation of the same.

**ESTEEMED PANELISTS IN THE POLICY DIALOGUE SESSION**

**22<sup>nd</sup> May 2020**

- Mr. C. K. Mishra, Secretary, MoEF&CC, Gol
- Dr. Dechen Tsering, Regional Director, UNEP, Bangkok, Thailand
- Dr. Abas Basir, Director General, SACEP, Colombo, Sri Lanka
- Mr. R. P. Gupta, Special Secretary, NITI Aayog and Secretary Designate, MoEF & CC, Gol and Shri Sudhir Kumar Sirohi, Adviser, Niti Aayog
- Dr. Arabinda Mitra, Scientific Secretary, Gol
- Ms. Shoko Noda, Resident Representative in India, United Nations Development Programme (UNDP)
- Mr. Rene Van Berkel, UNIDO, Representative, Regional Office India
- Mr. Rajiv Ranjan Mishra, Director General, National Mission for Clean Ganga, MoJS, Gol
- Prof (Dr). Randeep Guleria, Director, AIIMS
- Mr. V. K . Jindal, Joint Secretary, MoHUA, Gol
- Ms. Camilla Dannevig, Counsellor, Royal Embassy of Norway, New Delhi
- Ms. Kakuko Nagatani-Yoshida, Regional Coordinator for Chemicals, Waste, Air Quality, UNEP, Bangkok
- Dr. Atul Bagai, Head, UNEP India
- Mr. Shiv Das Meena, Chairman, Central Pollution Control Board
- Mr. A. K. Jha, Director General, NPC





# **APPENDIX 1**

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**PERSPECTIVES AND RECOMMENDATIONS RECEIVED FROM CHEMICAL AND  
PETROCHEMICALS MANUFACTURERS' ASSOCIATION FOR CONSIDERATION**



## **Perspectives and Recommendations received from Chemical and Petrochemicals Manufacturers' Association for Consideration**

### **Overall Recommendations and Webinar wise theme wise perspectives /recommendations:**

“Say No to Plastics Littering” - Focusing on anti-littering campaign: There is an urgent need for a comprehensive dialogue amongst all stakeholder to address the issue of litter while deriving all the benefits that products made from plastics offer in every field of our lives. The root cause of the problem is in littering and hence all our resources should be channelized towards two most important issues – building public awareness against littering and create adequate and efficient infrastructure to manage waste. Scientific waste management including segregation of plastic waste and processing needs focus. Government schemes such as SBM, Namami Gange may be synergized with Municipal level waste management system and initiatives such as UNEP countermeasures would help.

Capacity Building in Creating Awareness: There is an urgent need to put in efforts into Behavioural Change of the general public. Massive awareness campaigns need to be funded. All faith based (religious) leaders and various clan leaders could be involved for spreading the message.

Deterrents against Littering: Although, the SWM Rules and PWM Rules provides for spot fines for littering however, the implementation needs to be improved. Heavy fines need to be introduced for littering. Introduction of Landfill Tax as proposed in resource efficiency draft policy by 2021 of MoEF&CC may be introduced.

Extended Producers' Responsibility (EPR): There is an urgent need for robust frame work for Extended Producers Responsibility (EPR) for Plastics with defined yearly targets and reporting frequency, Traceability of safe disposal Certificates, setting up of a central packaging registry to track packaging used for a product, waste generated, collected, recycled and landfilled. This all can be achieved through a Digital Platform which seems an immediate need.

Microplastics: This is an emerging area which needs standardization of new methodology on microplastics research, with clear objectives. Extensive studies are required to assess microplastics contamination, their distribution in Indian rivers, associated wetlands, lakes etc. and the associated consequences on economics, ecology, and human health. Assessment of the impact of ingested microplastics and leached plastic additives on marine biota (mortality, morbidity, reproduction) and their effect on the food-chain.

Incentivising end-of-life plastic waste solutions: Co-processing could be used for only such plastics waste which is completely non-recyclable, both mechanical and chemical or cannot be used for road making. Blanket permits for waste co-processing in cement kilns; SPCB's to be sensitised.

Plastic waste into Road making needs to be encouraged as it improves stability, strength and fatigue life of the roads and provides higher resistance to deformation and water induced damages. However, again here too, only such plastic waste may be used which is completely non-recyclable, both mechanical and chemical. This is a win-win situation for all, plastic waste disposal, stronger road making and saving of Bitumen.

Deployment of low-cost traps in rivers, creeks, canals etc. would help maintaining the circularity of the material and shall plug in the leakage into the ocean.

Covid 19 waste management: This needs urgent priority. A complete session was dedicated to this subject. Workers handling the bio-medical waste should be given adequate protective gear to secure them from getting infected and included in insurance cover provided by government for frontline workers.

### **Webinar wise key recommendations for the workshop on Countermeasures for Riverine and Marine Plastic Litter in India during 12th to 22nd May 2020**

**Webinar 1:** The Science & Technology of Plastics & Techniques/Best Practices of Plastics Pollution Assessment and Investigation  
Date: 12<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Microplastics:

- Standardization of new methodology on microplastics research, with clear objectives
- Extensive studies are required to assess microplastics contamination and their distribution in Indian rivers, associated wetlands, lakes and others

#### Macro plastics study:

- Standardised process to be evolved
- Data to be collated
- CPCB study (By NEERI) on assessment of Plastics in MSW in 60 Cities can be used as benchmark



#### Marine Plastic Pollution Assessment:

- Understanding the fate and behaviour of microplastics within the water column, including the effects of fragmentation and bio-fouling (Modelling).
- Determining microplastic uptake by biota affecting the marine food-web and expand the use of sentinel species (e.g. bivalves) in detecting microplastic abundance. (Toxicology)
- Assessment of the impact i.e. mortality, morbidity and/or reproduction of ingested microplastics and leached plastic additives on marine biota, and their effect on the food-chain. (Experiments)

#### **Webinar 2:** Community Perceptions and behavioral aspects for plastic management and promotion of countermeasures to address (Riverine and Marine) plastic litter

Date: 14<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Perception and behaviour towards use of plastic:

- Increase Awareness to minimise littering and promote segregation at source
- Lack of Data transparency – need to create transparent / robust data
- Research on Life Cycle Assessment of Plastics and Micro-plastic
- Continuous capacity building and awareness generation programs
- Using creative means to disseminate information

#### Success factors/learnings for effective and sustained outreach and public engagement:

- Focus on targeted stakeholders in campaigns.
- Customized campaigns for public engagement. No one size fits all.
- Repeated messaging and monitoring of consequent behavioural changes.
- Data based campaigns for impactful messaging leading to informed choices.
- Cultural practices need to be considered.
- Focus on Youth and Women for optimal impact.
- Investment in high quality design is important.
- Colour coding with labelling and a list of items in pictures on public bins.

#### Infrastructure:

- Basic infrastructure upgrade – dustbins installed at a 50m distance on prime locations. Frequent waste collection.
- Informal waste collectors to be included in the system to recover maximum resources during collection
- Collection system to be connected to CSOs making products out of waste material
- Slums to be included on the collection map

#### Policy support:

- Pilot demonstration of some waste recycling/ co-processing solutions such as – SUP to IIPM, HDB into sheets.
- Enhance entrepreneurship around plastic recycling, technology and capacity development
- Strengthening the partnership and network in cities especially with the city government and on ground stakeholders.
- Higher fines on littering and open dumping

#### **Webinar 3:** Activities and Best practices to counter plastics litter by sustainable waste management and circularity

Date: 16<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Extended Producer Responsibilities:

- Need for EPR Regulator with defined yearly targets and reporting frequency
- Traceability of safe disposal Certificates
- Set up a central packaging registry to track packaging used, waste generated, collected, recycled and landfilled – Immediate need for Digital platform
- Implement polluters pay principle by (visibly) including cost of transportation and processing of packaged waste in product prices
- Promote business models of MRFs and recycling units based on location specific studies specifying types of plastics available and demand of processed products as raw material
- Promote design changes in packaging. e.g. Alternative materials to plastics, shift from polymers to monomers
- Promote market potential of recycled products (eg. Bottle to Bottle Recycling) by including standards for products in the National EPR Framework
- Strengthen value chain of plastics with special focus on strengthening role of the informal sector in collection and operation of MRFs

#### Co-processing of plastics in Cement Kilns:

- Strict Implementation of Polluter Pays Principle; SCF & plastic waste management, encourage infrastructure development
- Introduction of Landfill Tax as proposed in resource efficiency draft policy by 2021
- Notification & implementation of EPR guidelines imperative; encourage more plastic collection; strict monitoring
- RDF Grade I, II & III to be considered as standards from MoHUA report; SCF management be part of MSW tenders with SCF management cost to be compensated from gate fees;

- Pre-processing infrastructure in cement plant extension to ULB MSW infrastructure; hence tax exemptions similar to MSW projects;
- Cementitious & calcined dust extraction from cement kilns; with mixing in final product should be allowed
- Blanket permits for waste co-processing in cement kilns; SPCB's to be sensitised

#### Use of Waste Plastic in Bituminous Road Surfacing:

- Majority of Tenders related to road construction should be floated making mandatory use of waste plastic
- Zero Plastic waste Policies Should be framed
- Well organized Plastic Collection Centre

#### **Webinar 4:** Assessment of plastic pollution impact on natural capital and riverine and marine ecosystems needing policy intervention

Date: 18<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

#### Microplastic Assessment at Ganga and Yamuna Basin:

- There is a requirement to make a comprehensive microplastic monitoring plan in water bodies, validated by microplastic assessments
- This study must be undertaken in other major rivers along the major plastic waste generating cities in the country

#### Lost Plastic and its consequences:

- In-depth understanding is needed for the fate of the lost plastic and the associated consequences on economics, ecology, and human health. A more comprehensive human exposure assessment is needed.

#### Life Cycle Analysis of Plastic Products in the Plastic Value Chain:

- Need for clear definition/understanding of the recycling of plastics products based on the carbon foot prints, ease of recycling, economics and life cycle analysis with elements such as defining recyclability, establishing recyclable hierarchy among others, product design, among others.
- Hierarchy could be propagated by maximizing reduction/reuse/recycling of plastic through awareness campaign and minimizing landfill/dumping through regulatory intervention and landfill taxation.



**Webinar 5:** Impact of COVID-19 on plastics consumption, innovation, logistics and waste generation (including PPEs and wastes from Health Care Facilities) and related challenges

Date: 20<sup>th</sup> May 2020 | 14:30 – 17:00 hrs

Personal Protective Equipment (PPE):

- The reusability and recyclability of PPE have to be enhanced and waste management has to be considered as a critical design in healthcare sector.
- Enhance the design principles in waste management and improve the incentives for recycling of PPE.

Impact of recycling on COVID-19:

- Data should be collected on the waste generated and disposal should be monitored. Designs can be developed to improve the recyclability of plastics and therefore, reduce their entry in the waste streams.
- Advocate the society on the importance of segregation at source which will lead to increased recycling of plastics thereby reducing the littering and proper disposal of PPE to reduce the spread of virus.
- Sanitation workforce (Safai Sathis) should be given sufficient support by providing them with identity cards, safety kit, ration cards, access to social protective schemes etc.

Challenges faced - Management of bio-medical waste:

- Authorities should look into the operational and financial obligations of waste disposal for smooth functioning.
- Segregation at source and separate collection mechanism should be pushed to prevent the further spread of virus. The collected waste should be labelled to avoid mixing with MSW.
- Develop infrastructure for safe disposal of bio-medical waste.
- Workers handling the bio-medical waste should be given adequate protective gear to secure them from getting infected.

**Webinar 6:** Impact of COVID-19 on plastics consumption, innovation, logistics and waste generation (including PPEs and wastes from Health Care Facilities) and related challenges

Date: 22<sup>nd</sup> May 2020 | 14:30 – 17:00 hrs

Methodology and standardization for Plastic Hotspotting & Plastic Leakage Scenario to adopt countermeasures in an urban setting in India:

- Application of Standard Assessment Methodology (developed under CounterMeasure project) for scaling up
- Creation of drivers of recycled plastics sector
- Support for enhancing plastic segregation by strengthening waste management infrastructure and development of ecosystem (EPR, Instruments, Incentives Up g) & Down, Pricing)
- Incentivising innovative product/packaging design to support recyclability
- Application of LCA for scientific environmental evaluation of alternatives

Effectiveness of single use plastic bans in India and proposed national policy recommendations:

- List and define SUPs
- Phase-wise plan and national classification of SUPs
- Incentivise effective waste management with focus on segregation, collection and recycling
- Effective implementation of EPR
- Design and circular innovations