TRAINING MODULE

STANDARD OPERATING PROCEDURE (SOP) FOR ASSESSMENT AND CHARACTERISATION OF PLASTIC WASTE (INCEPTION TRAINING)

Training Module developed under “EU-India Resource Efficiency and Circular Economy Initiative (EUI RECEI) and “Circular Economy Solutions Preventing Marine Litter in Ecosystems” implemented by GIZ India in collaboration with Ministry of Environment, Climate Change and Forest. Trainings are Jointly conducted by MoEFCC, CPCB and GIZ India.

Table of Content

Module 1 : Introduction

Assessment & Characterization of Plastic Waste

Background

- Central Pollution Control Board (CPCB) Standard Operating Procedure (SOP) for Plastic Waste Assessment and Characterization mandates for informed decisions to supporting the Urban Local Body (ULB) and Panchayats at District Level in assessment and characterization of Single-Use Plastics (SUP) and Plastic Packaging Waste.
- Enables informed decision-making and ensures compliance with Plastic Waste Management (PWM) Rules 2016.

01

As per Rule 6 (5):

- Local body shall undertake assessment of plastic waste generated
- Estimate the quantity of plastic waste to be generated by 30th June and forecast for the next five-year period

02

As per Form V Part A & B:

- Local bodies & District Panchayats are required to assess plastic generated within their jurisdiction
- Include these details in Annual Report to be submitted online by **30th June of every year**

03

As per Form VI:

- SPCBs/PCCs are required to assess the plastic waste generated within their jurisdiction
- Include these details in Annual Report to be submitted online by 30th July of every year

Image Source – Stock Image

Different Types of Plastics and its Uses

						
PET	**HDPE**	**PVC**	**LDPE**	**PP**	**PS**	**O**
Polyethylene terephthalate	**High-density polyethylene**	**Polyvinyl chloride**	**Low-density polyethylene**	**Polypropylene**	**Polystyrene**	**Other**
						
Soft drink bottles, furniture, carpet, paneling, etc.	Bottles, carry bags, milk pouches, recycling bins, agricultural pipe, base cups, playground equipment, etc.	Pipe, window profile, fencing, flooring, shower curtains, lawn chairs, non-food bottles, children's toys, etc.	Plastic bags, various containers, dispensing bottles, wash bottles, tubing, etc.	Auto parts, industrial fibers, food containers, dishware, etc.	Cafeteria trays, plastic utensils, toys, video cassettes and cases, clamshell containers, insulation board, etc.	Thermoset plastics, multilayer and laminates, Bakelite, polycarbonate, nylon, SMC, FRP, etc.

What is Plastic Waste Characterization?

Plastic waste characterization is a systematic methodology used to classify and quantify plastic waste generated within a defined jurisdiction, specifically to meet the reporting and management requirements under the Plastic Waste Management (PWM) Rules, 2016.

Plastic waste characterization typically involves the following:

01

Identification of the specific types of plastic materials in a waste stream

02

Sort and weigh plastic waste into categories as defined and mentioned in the rules.

03

Includes multiple sites/locations and repeat the exercise for specific number of days (refer to the SOP for the number of days).

04

Outputs include the composition of plastic waste in various categories and SUP items from different sectors (e.g., residential, commercial, etc.)

How is it Useful?

Establishing Baseline for Plastic Waste Management

Helps cities understand current waste management conditions.

Developing Reduction and Management Strategies

Identifies prevalent plastic waste types and support future reduction & diversion efforts

Selecting Plastic Waste Processing and Management Technologies

Helps determine the right type of technologies & programs for plastic waste.

Evaluation and Improvement Initiative

Identifies recyclable plastics still being disposed of and help local bodies design new initiative for recycling.

Image Source – Picture 1 -Rajasthan Plastic Waste Inventorisation Study, published by RSPCB, 2022
Picture 2, 3 and 4 – HDFC project by CEE on plastic waste management project in Ganjam District, Odisha

WASTE CHARACTERIZATION FOR ULB & PANCHAYAT AT DISTRICT LEVEL

Define and agreed zones and areas

Socio-Economic Categories (Generation Points)

- High income
- Middle income
- Economic weaker section (EWS)
- Commercial wards (CW)
- Mixed commercial and residential wards (MX)

Disposal points

East

West

North

South

Central

Online training of ULBs to explain the process and setting up team

Physical Training Parameters: On-site for waste characterization

Parameters

- Number of vehicles to be sampled (n)
- Sorting sample size (kg)
- Vehicles load size (kg)
- Duration of sampling (No. of days)

Sampling Process and Execution

Sample preparation (Coning and quartering method)

Waste characterization (different type of plastic packaging wastes

05 Categories

- Rigid plastic (cat 1)
- Flexible plastic (cat 2)
- Multi layered plastic (Cat 3)
- Compostable plastic (cat 4)
- Biodegradable Plastic (Cat 5)

Assessment of different plastic packaging waste categories and SUP in plastic waste

SUP (19 + 1 Types)

Team for Waste Characterisation (Suggestive)

Chief Health Officer or Officer In-charge

- Oversee the entire project's field activities

Sanitary Inspector/ Site In-charge (One per Sampling Site)

- Responsible for selecting, obtaining, weighing, and transporting waste samples for sorting.

Safai Mittras/ Waste Sorters & Helpers

- Physically handle the individual materials in the waste stream and place the materials into appropriate containers.
- Typically include two to six waste sorters.
- Can engage informal sector waste workers from the area as waste sorters.

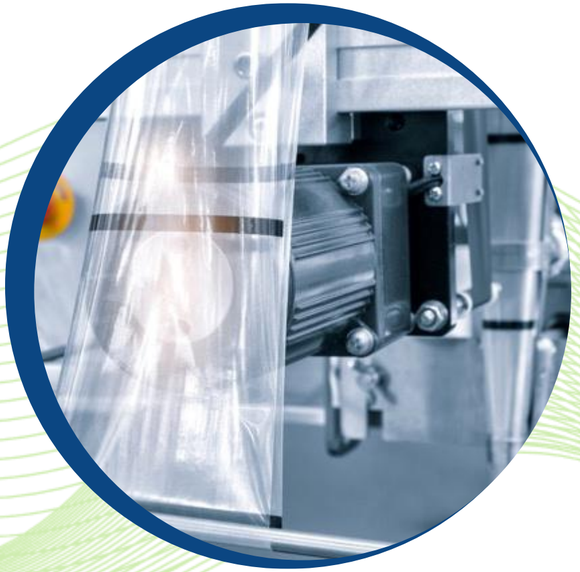
Note: This is a suggestive team structure and may be modified or customized based on the specific requirements of the ULB.

Expected Outcome of Plastic Waste Characterization

Plastic Waste Categories as per PWM 2016

Single Use Plastic Waste

Plastic items intended to be used once for same purpose before being disposed of or recycled



Plastic Packaging Waste (Plastic Packaging Material)

Cat I: Rigid Plastics
Cat II: Flexible Plastics
Cat III: Multi Layered Plastic
Cat IV: Compostable Plastics
Cat V:Biodegradable Plastics

Other (Non-Packaging Waste)

It will consist of total plastic waste excluding packaging plastic waste.

Single Use Plastics

Amendment to PWM Rules – 12.8.21 Single-use plastics (SUP) Section [3 V(A)]

"Single-use plastic commodity" means a plastic item intended to be used once for the same purpose before being disposed of or recycled.

- Prohibits manufacture, import, stocking, distribution, sale & use of single use plastic items w.e.f 1.7.22(Rule 4(b))

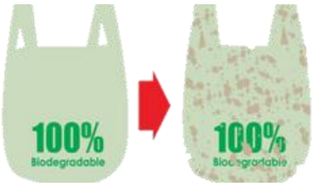
- **CPCB has identified 20 single use plastic items which are restricted.**

No.	Single-Use Plastic Item	
1	Earbud Plastic Sticks	Plastic Sticks
2	Balloon Plastic Sticks	
3	Candy Plastic Sticks	
4	Ice Cream Plastic Sticks	
5	Plastic Plates	Cutlery Items
6	Plastic straws	
7	Plastic Cups	
8	Plastic Glasses	
9	Plastic Forks	
10	Plastic Spoons	
11	Plastic Knives	
12	Plastic Trays	
13	Plastic Packaging/Wrapping Film on Sweet Boxes	Packaging/ wrapping Films
14	Plastic Packaging/Wrapping Film on Invitation Cards	
15	Plastic Packaging/Wrapping Film on Cigarette Packets	
16	Plastic Carry bags <120 microns	
17	Plastic Carry bags <50 microns	
18	Plastic Flags	Other Items
19	PVC Banners < 100 microns	
20	Polystyrene for Decoration	

Plastic Packaging Waste Categorization

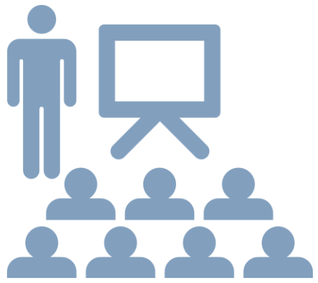
Category	Plastic type	Description	Examples	Representative pictures
Category-I	Rigid	The packaging which are rigid in nature	• Soft drink bottles • Water bottles (PET) & juice bottles • Food containers • Shampoo bottles • Plastic containers	
Category-II	Flexible	Flexible plastic packaging of single layer or multilayer (more than one layer with different types of plastic) plastic sheets and covers made of plastic sheet	• Plastic sheets and grocery bags • Wrap/cling film • Plastic packaging for toiletries (shampoo sachets, lotion pouches), medical supplies, electronic devices (bubble wrap, anti-static bags), • Clothing, pharmaceuticals etc.	

Plastic Packaging Waste Categorization

Category	Plastic type	Description	Examples	Representative pictures
Category-III	Multilayer Plastic	Multilayered plastic packaging (at least one layer of plastic and at least one layer of material other than plastic)	Packaging used in FMCG products like milk products & juice storage boxes, Packets of biscuit, namkeen mixture, chips & other multilayer packaging.	
Category-IV	Compostable plastic	Plastic sheet used for packaging as well as carry bags made of compostable plastics	Compostable shopping bags, food packaging, sheets and others	
Category- V	Biodegradable Plastic	Plastic sheet used for packaging as well as carry bags made of biodegradable plastics	Biodegradable dustbin bags , sheets and others	

SOP Implementation for Plastic Waste Characterization & Assessment

1	2	3	4	5
SPCBs/PCCs to impart training to the concerned stakeholders on assessment & characterization of plastic waste as per SOP and CPCB online reporting	Local bodies shall carry out assessment either directly or through an agency engaged by them. The State Level Authorities can also collectively engage agencies at the state level	SPCBs/PCCs to monitor the implementation of SOP.	Local bodies/ VPs/SPCBs/PCCs shall submit the information related to assessment & characterization in accordance with provisions 17(4) & 17(6) of PWM Rules, 2016 (as amended).	ULBs to capture the data on the online portal developed by CPCB



Module 2 : Methodology for Plastic Waste Characterization & Assessment

Local Bodies and District Panchayats

Methodology for Plastic Waste Characterization & Assessment as per CPCB

1

Determination of Parameters for Waste Characterization

2

Distribution of Sampling Locations

3

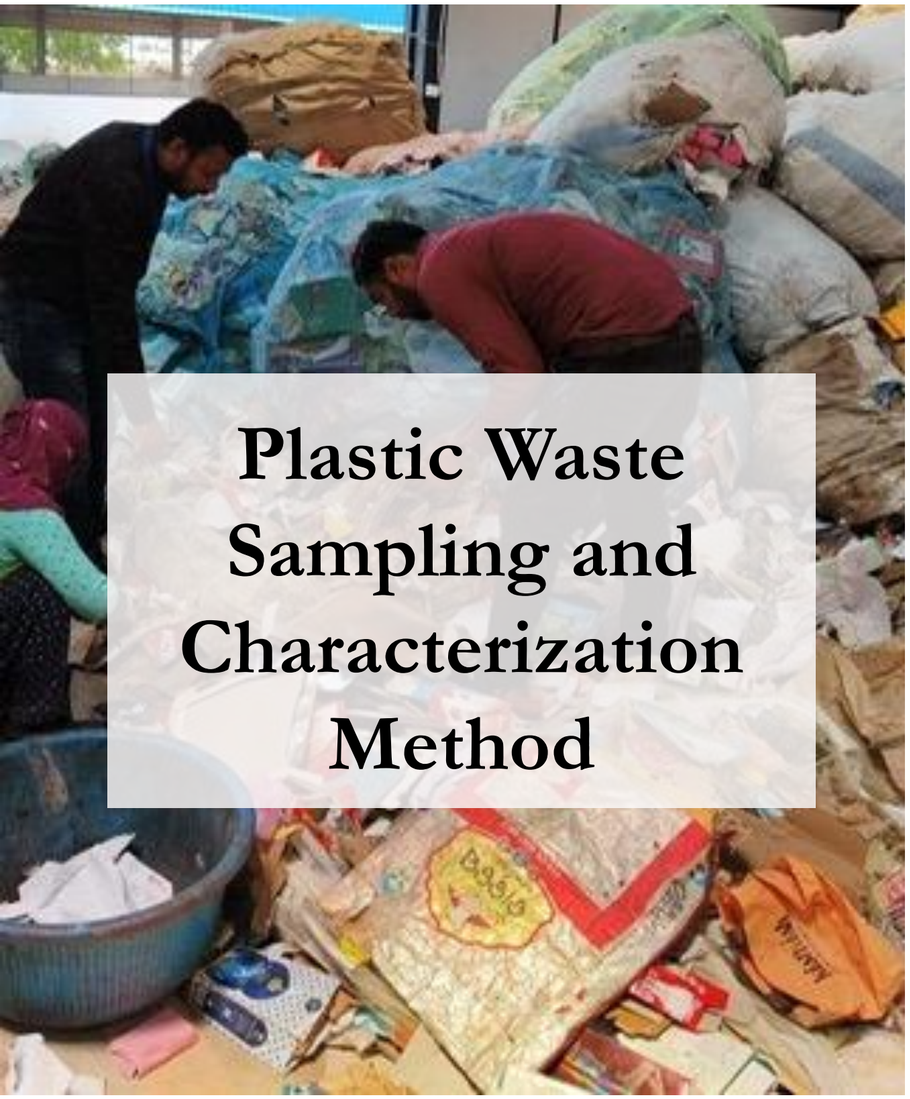
Sample Preparation

4

Waste Characterization

5

Assessment of plastic waste by local bodies



Plastic Waste Sampling and Characterization Method

01

We need to use appropriate techniques to collect representative plastic waste from various sources to ensure accurate analysis.

02

The plastic waste characterization method prescribed in the SOP is based on the Standard Test Method for Determination of the Composition of Plastic Waste as per the **American Society for Testing and Materials (ASTM) Standard D5231-92.** This test method outlines procedures for determining the composition of unprocessed Municipal Solid Waste (MSW) through manual sorting and classification of waste samples.

03

The test method includes procedures for the **collection of a representative sorting sample of unprocessed waste, manual sorting of the waste into individual waste components, data reduction, and reporting of the results.**

04

The test method may be applied at waste generation points, landfill sites, waste processing and conversion facilities, and transfer stations.

Step 1 - Parameters for Waste Characterization

ASTM (D5231-92): Standard Test Method for determination of the composition of unprocessed municipal solid waste

Table 1: Parameters for Waste Characterization

Sr. No.	Parameters	Description
1	Numbers of samples **(n)**	Numbers of vehicles to be sampled transporting municipal solid waste
2	Sorting sample size (kg) **(s)**	Quantity of sample size (Kgs) from vehicle load.
3	Vehicle load Size (kg) **(v)**	Quantity of total municipal solid waste in one vehicle load
4	Duration of sampling (No. of days) **(k)**	Numbers of days during which waste samples for analysis have to be collected.

Sorting sample size (s) = (¼) of Vehicle load size (v)

Step 1 - Indicative Values of Various Parameters for Cities, Towns and Villages (Contd.)

Table 2: Parameters for Cities, Towns and Villages

Sr. No.	Category	Maximum Population	Vehicle Load size (v) (Kg)	Sorting sample size (s) (Kg)	Total No. of samples to be collected (n)	Sampling days (k)
1	Village Panchayat	4,999	360#	90	7	5
2	Cities & Towns	99,999	400	100	14	6
3	Cities & Towns	>1,00,000	480	120	45	7*

Note: Higher confidence level and lower precision value is required for larger cities.

#***In hilly regions where movement of heavy vehicles is difficult, the Vehicle Load size of "360 Kg" applicable for "Village Panchayats" can be considered for Cities and Towns (Category 2 and 3)***

****As per American Society for Testing and Materials (ASTM) standard test method (D5231-92), weekly sampling period (k) has been specified in the range of 5-7 days.***

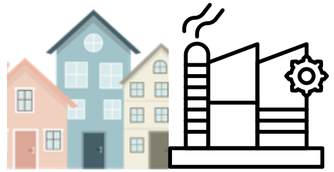
Step 1 - Determining the Parameters - Example

City XYZ

- City Name: XYZ
- Population: 6,12,500
- Quantity of total Mixed Waste generated: 100000 Tons per Annum
- Key points to observe
  - Majority of the people are middle income group and no high-income groups
  - All the waste generated in the city is being transported to the one disposal site
  - One Material recover facility are installed
  - There are multiple collection points near by the various wards to collect waste.
- Therefore, as per table 2.
  - Values for various parameters for the waste characterization study will as under:
- No. of Vehicle to be sampled (n): 45
- Duration of sampling (No of Days) (k): 6 (For this example we have taken the value as 6 that is from the range 5 – 7 as per the ASTM **(D5231-92)**)
- Vehicle load size: 480 kg
- Sorting Sample size: 120 kg

Generation And Disposal Point

Generation Point - Locations from which waste is generated



Collection (waste collecting Vehicle)

MRFs

Disposal Point - Transfer Points/ MRFs/ Dhallaos/ Waste Processing Facility

Recycling

Step 2 - Distribution of the Sampling Locations (1/2)

Random sampling method

- To ensure full coverage of the geographical area
- To include impact of socio-economic variation
- Consider land use pattern affecting waste generation.

Samples to be collected from both **generation points** as well as **disposal points**.

- **Generation Points :** Households, Streets, Gated Societies, etc.
- **Disposal Points:** Landfills, Dhallaos, Transfer stations, MRFs

01 Divide the city area into Five Zones

02 Classify the wards within each zone based on socio-economic and land use patterns

03 Identify disposal point within each zone

Step 2 - Distribution of the Sampling Locations (2/2)

Table 3: Classification of wards as per socio economic zones

Sr. No.	Classification of Wards	Description
1	High-income residential wards (HI)	• Single detached houses with parking and garden • Luxury condominiums • High rise buildings
2	Middle-income residential wards (MI)	• Apartments • Single detached houses without garden
3	Economically Weaker Section (EWS)	• Single room residents • Areas with low rentals/slum areas • Lowest property tax or tax exempted areas • Unauthorized settlements
4	Commercial wards (CW)	• Commercial establishments • Shops and market areas
5	Mixed commercial and residential wards (MX)	• Areas where both commercial and residential complexes are present in an equal ratio.

The description of wards: as per the SOP Annexure III

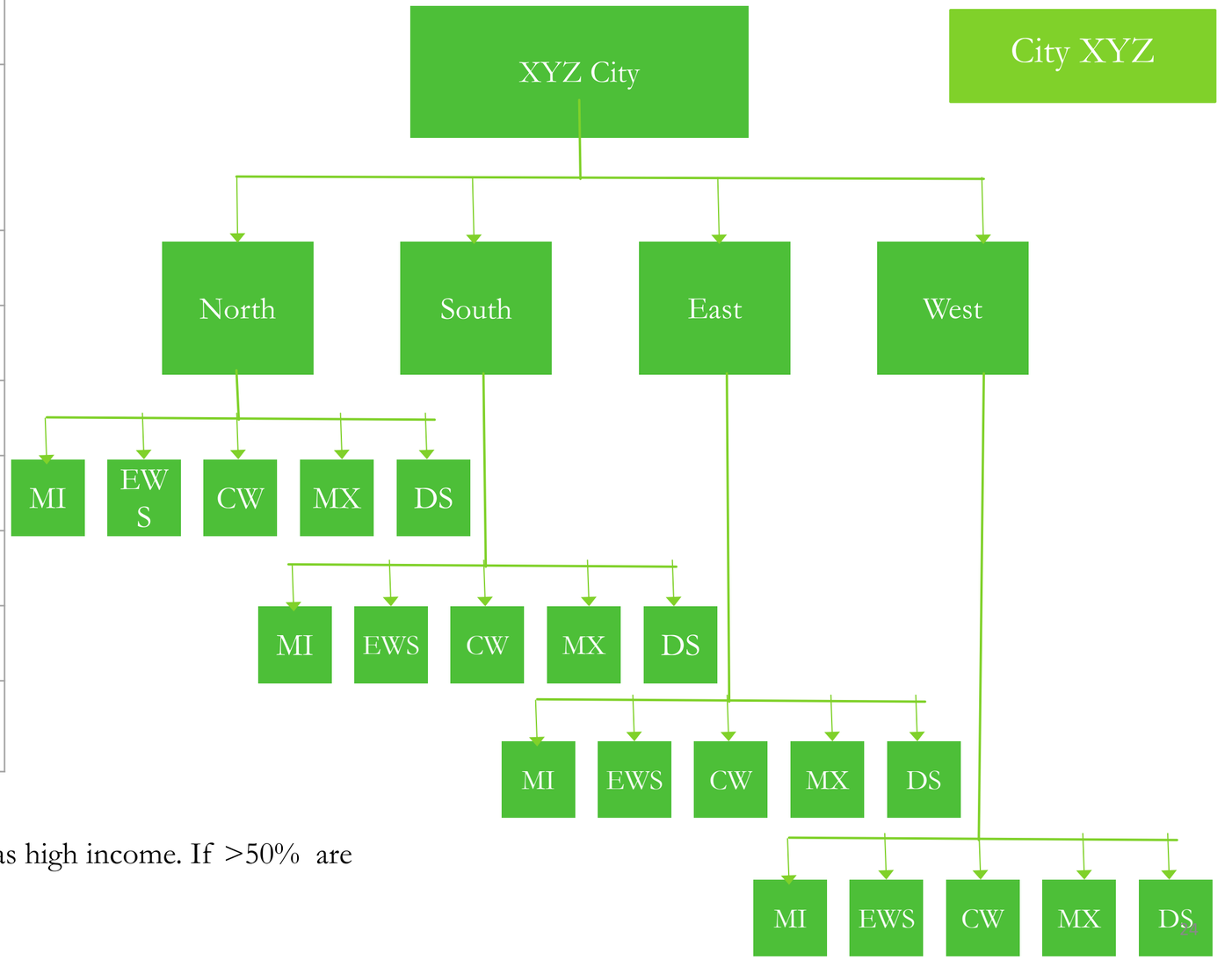
Step 2 - Distribution of Sampling - Example

Excel tool has been created and Link is attached above.

Microsoft Excel ro-Enabled Works

	East					West					North					South					Total
Day	M	EW	C	M	D	M	EW	C	M	D	M	EW	C	M	D	M	EW	C	M	D	
	I	S	W	X	S	I	S	W	X	S	I	S	W	X	S	I	S	W	X	S	
1	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	1	1	8
2	0	1	0	0	1	0	0	1	0	1	0	0		1	1	1	0	0	0	1	8
3	0	0	1	0	1	0	0	0	1	1	0	1	0	0	1	0	1	0	0	1	8
4	0	0	0	1	1	1	0	0	0	1	1	0	0	0	1	0	0	1	0	1	8
5	0	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	1	1	7
6	0	1	0	0	1	0	0	0	0	1	0	0		0	1	1	0	0	0	1	6
Total	1	2	1	1	6	1	2	1	1	6	1	1	2	1	6	2	1	1	2	6	45

In continuation to the example, the distribution of the city for the sampling will be conducted as below



- In a ward, if >50% households are high income, then ward is categorized as high income. If >50% are low income, it is categorized as low income.
- Sample from disposal point is to be collected every day from all zones
- On an average, 6-8 vehicles are to be sampled every day.

Step-3: Sample Preparation: What is Quartering Technique?

1 2 3 4 5

Preparation of Cone from mix waste.
480 Kg

Flattening & partitioning of the cone into two parts
240 kg +240 kg
240-240 kg each

Partitioning of the Cone into four parts
120 kg*4

Select two opposite quarters & discard the remaining two
120*2

Mix the two selected quarters into one and repeat the process again from step 01 to obtain mix waste sample of 100-125 kg for further characterization

Step-3: Sample Preparation: On Site Demo Exercise at Chennai

Preparation of Cone from mix waste

Flattening & partitioning of the cone into two parts

Partitioning of the Cone into four parts

Select two opposite quarters & discard the remaining two

Mix the two selected quarters into one and repeat the process again

For Step 3 - Standard Checks & Balances Need to be Adopted during Waste Characterization Exercise

Hand-handled weighing scales and weighing machines should be used during the exercise.

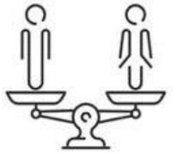
Adequate sacks or packaging materials should be ensured for storing the segregated waste components.

Take proper care on all aspects of measurements and ensure that in case of battery-operated weighing scale battery is fully charged. .

Segregate and weigh only one sample at a time.
All sampling exercises should be photo-recorded to ensure transparency and correctness.

Ensure on-the-spot collection, segregation, and measurement of all sample types within the same day.

The waste characterization exercise should be participatory in nature and carried out as per the Standard Operating Procedure (SOP)

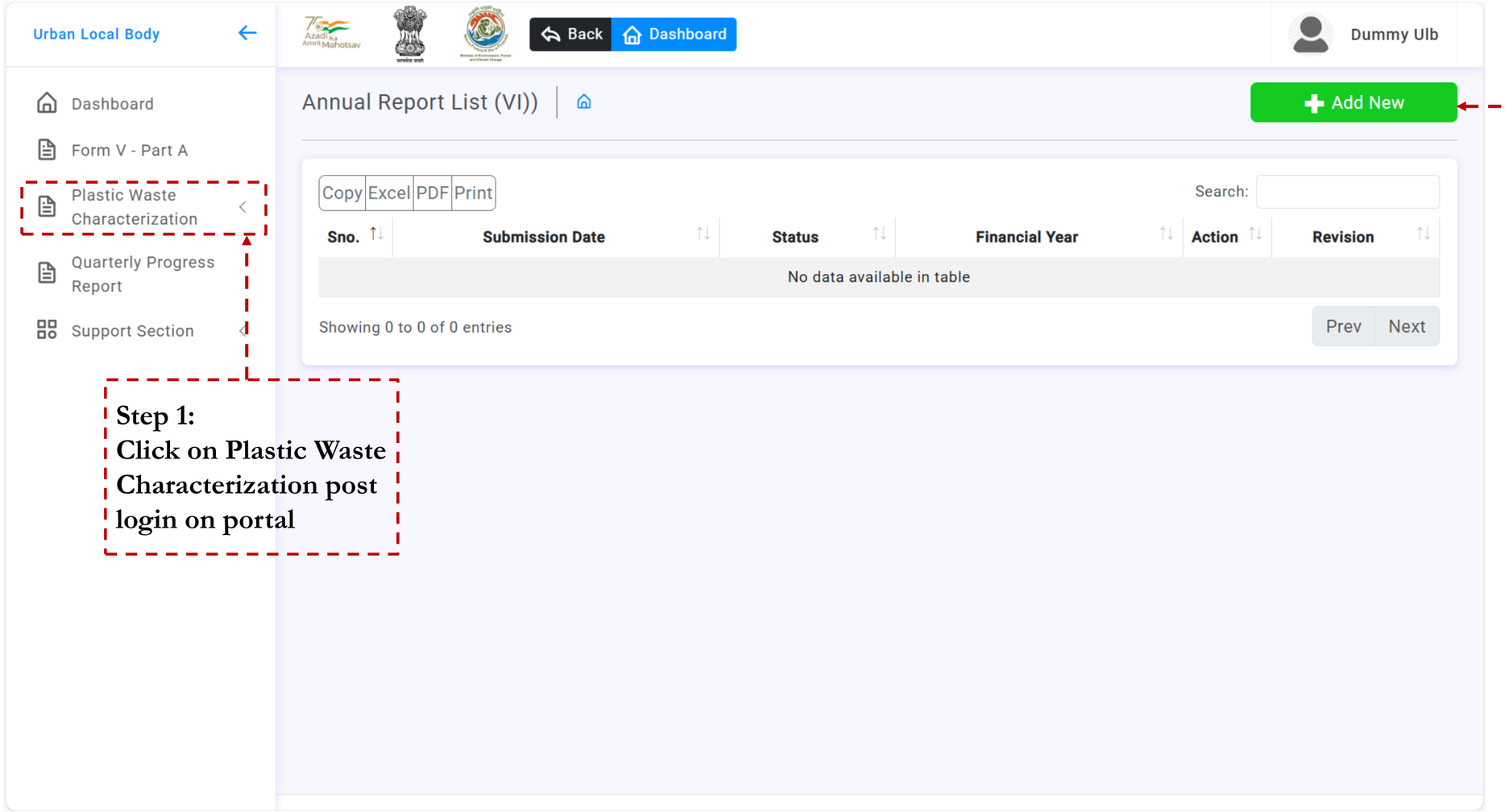


Step-4: Waste Characterization - Plastic Waste Sorting & Weighing

Image Source: Rajasthan Plastic Waste Inventorisation Study, published by RSPCB, 2022

Unload the Mix Waste sample on the Sorting Table	Identify and Separate Waste	Sort Waste	Recover Fines	Weigh Sorted Waste	Review Waste Sample Record.	Dispose of Waste Properly
• Carefully place waste samples obtained from quartering and Coning method on the sorting table • Avoid spills or overloading	• Open waste bags and separate materials. • Categorize plastic waste (Category I-V & SUP items) accordingly.	• Place each material type in its designated container. • Pass materials carefully; avoid throwing them across the table.	• Sweep small, indistinguishable waste (“fines”) for collection & weighing.	• Weigh each labeled container separately. • Record weight, ensuring tare weight is subtracted during analysis.	• Verify that all weights, waste sources & hauler details are correctly recorded.	• Recycle recoverable materials into designated bins. • Arrange a vehicle for proper waste disposal.

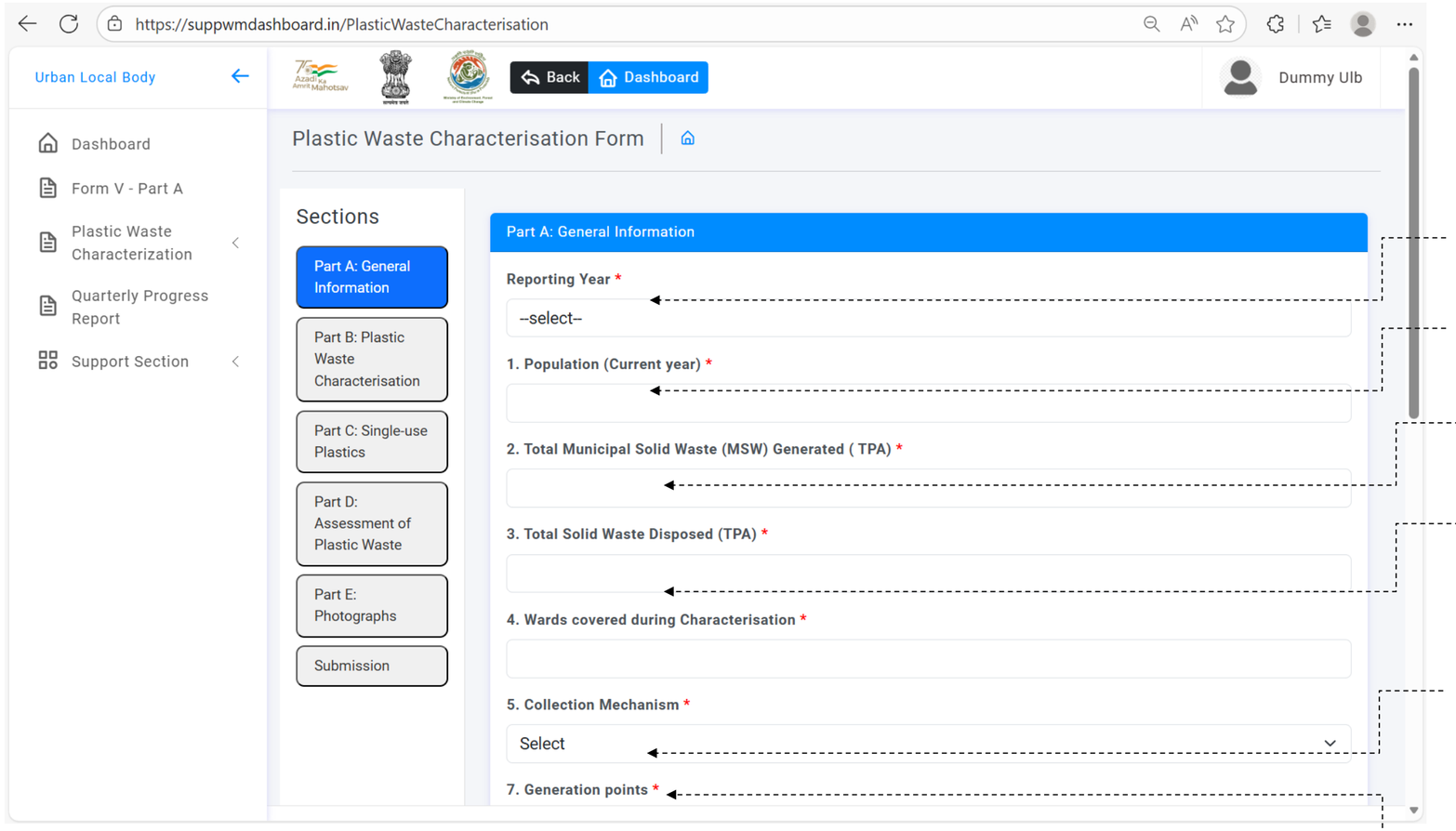
Access Plastic Waste Characterization Module on Portal



Step 1:
Click on Plastic Waste Characterization post login on portal

Step 2:
Click on Add New Tab to add details of Characterisation

Section: Part A (General Information) (1/2)



Select Reporting Year

Enter Population of current year

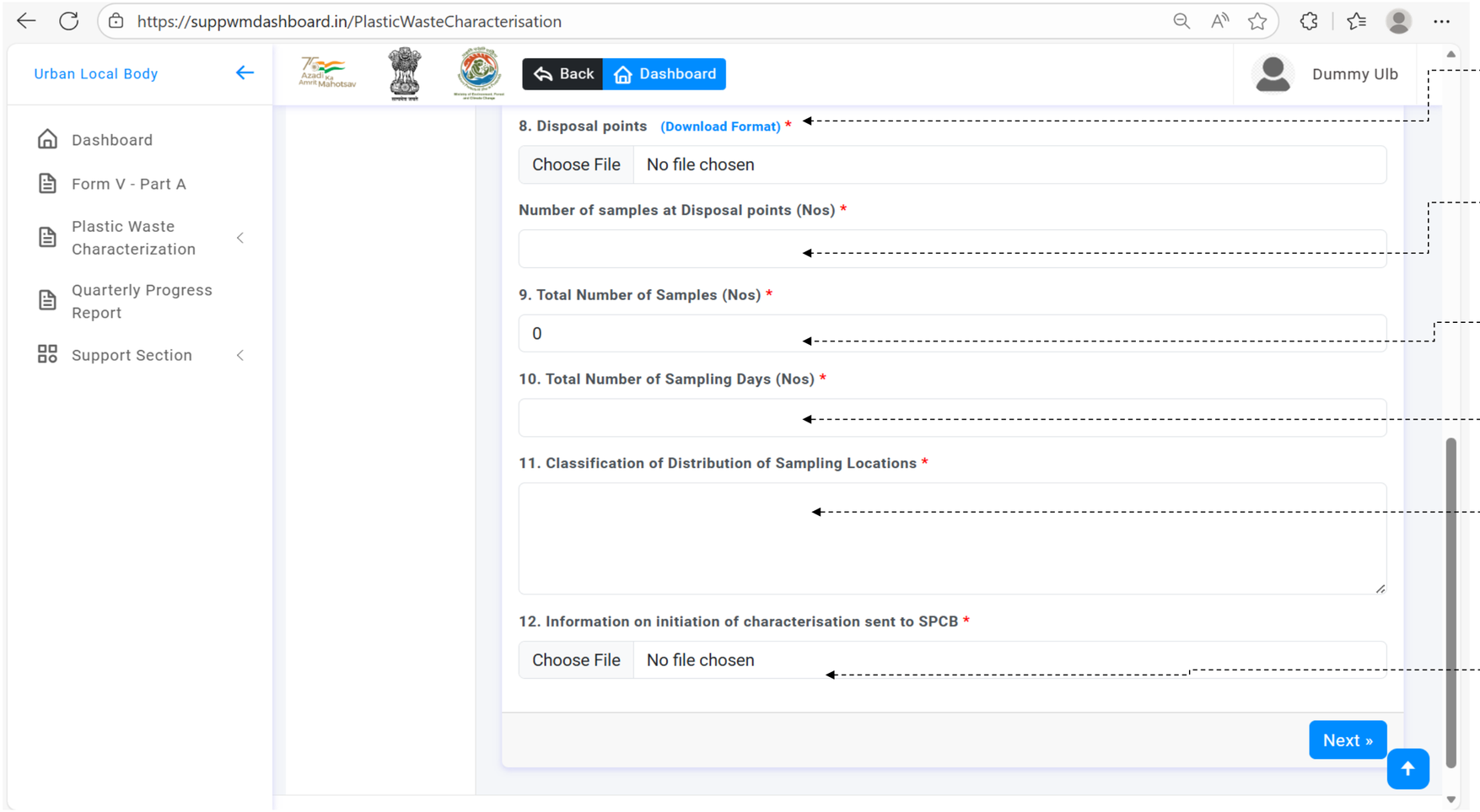
Enter Quantity of MSW Generated in TPA

Enter Quantity of Solid Waste disposed

Select Door to Door Collection Mechanism adopted by Local Body: Mixed Waste/Dry Waste/Plastic Waste Separately/If any Others, please specify

Enter Generation Point Numbers

Section: Part A (General Information) (2/2)



Click on Download Format, filled and upload

Enter number of samples taken at Disposal Points

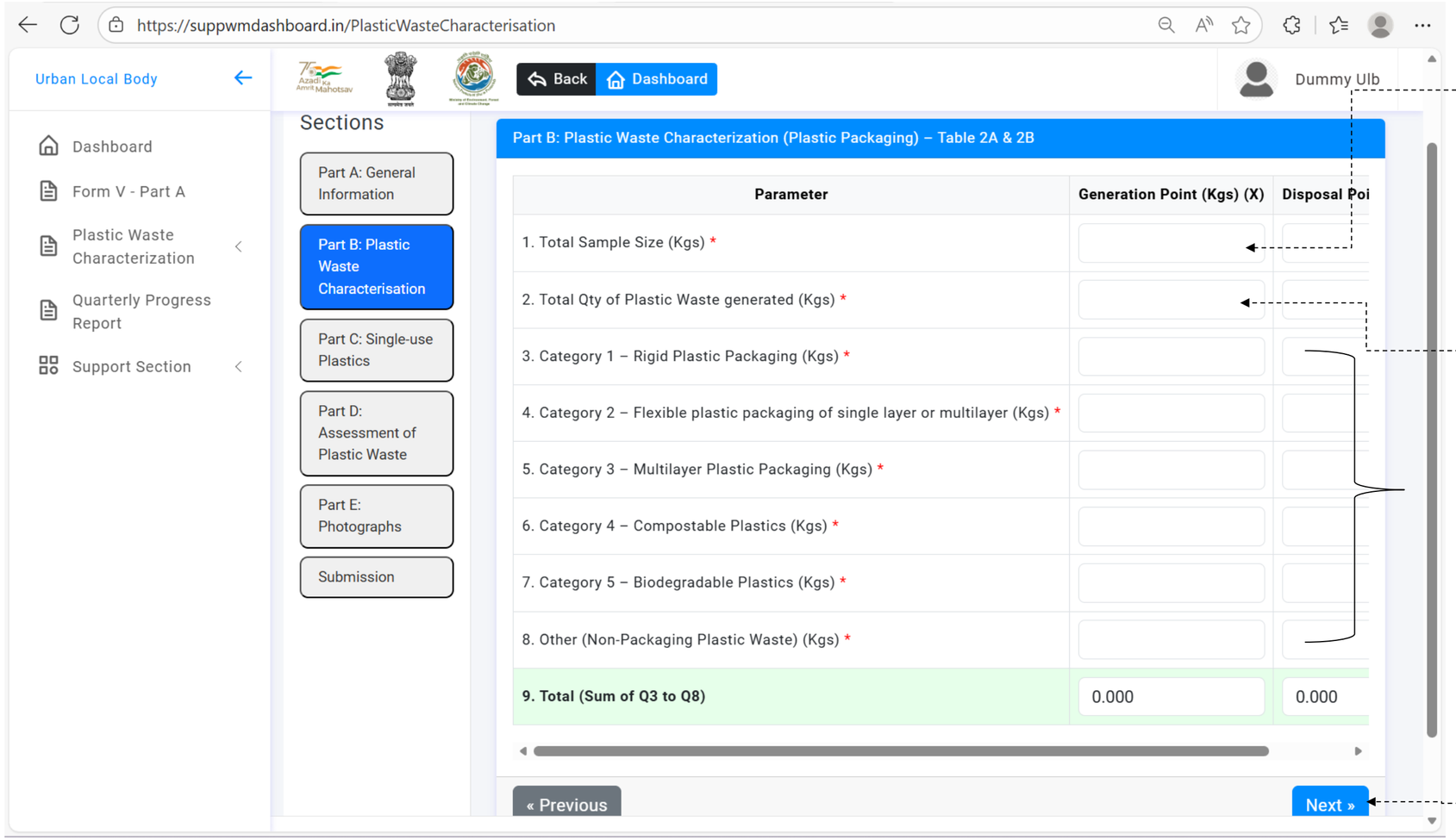
Enter total number of samples

Enter total number of sampling days

Enter classification of distribution of sampling locations as per CPCB SOP

Upload letter/communication sent to SPCB/PCC for intimation about initiation of plastic waste characterization

Section: Part B (Plastic Waste Characterization)



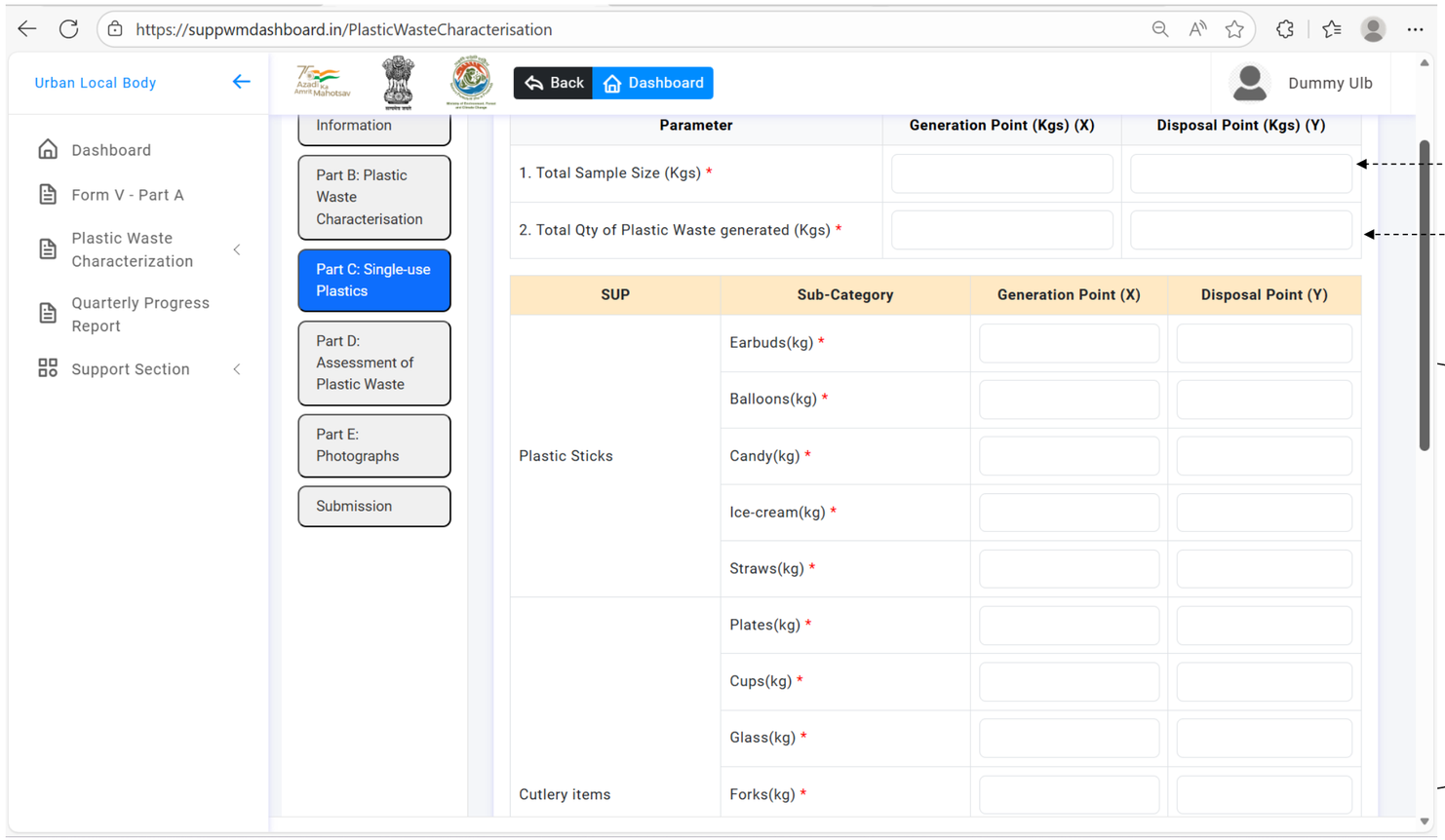
Enter Quantity of total sample size in KGs collected from Generation & Disposal Points

Enter total quantity of plastic waste generated in KG from Generation & Disposal Points

Enter quantity of Category: 1, 2, 3, 4, 5 & Other Plastic waste sampled from generation & disposal points

Click on Next to proceed further

Section: Part C (Single Use Plastics) (1/2)

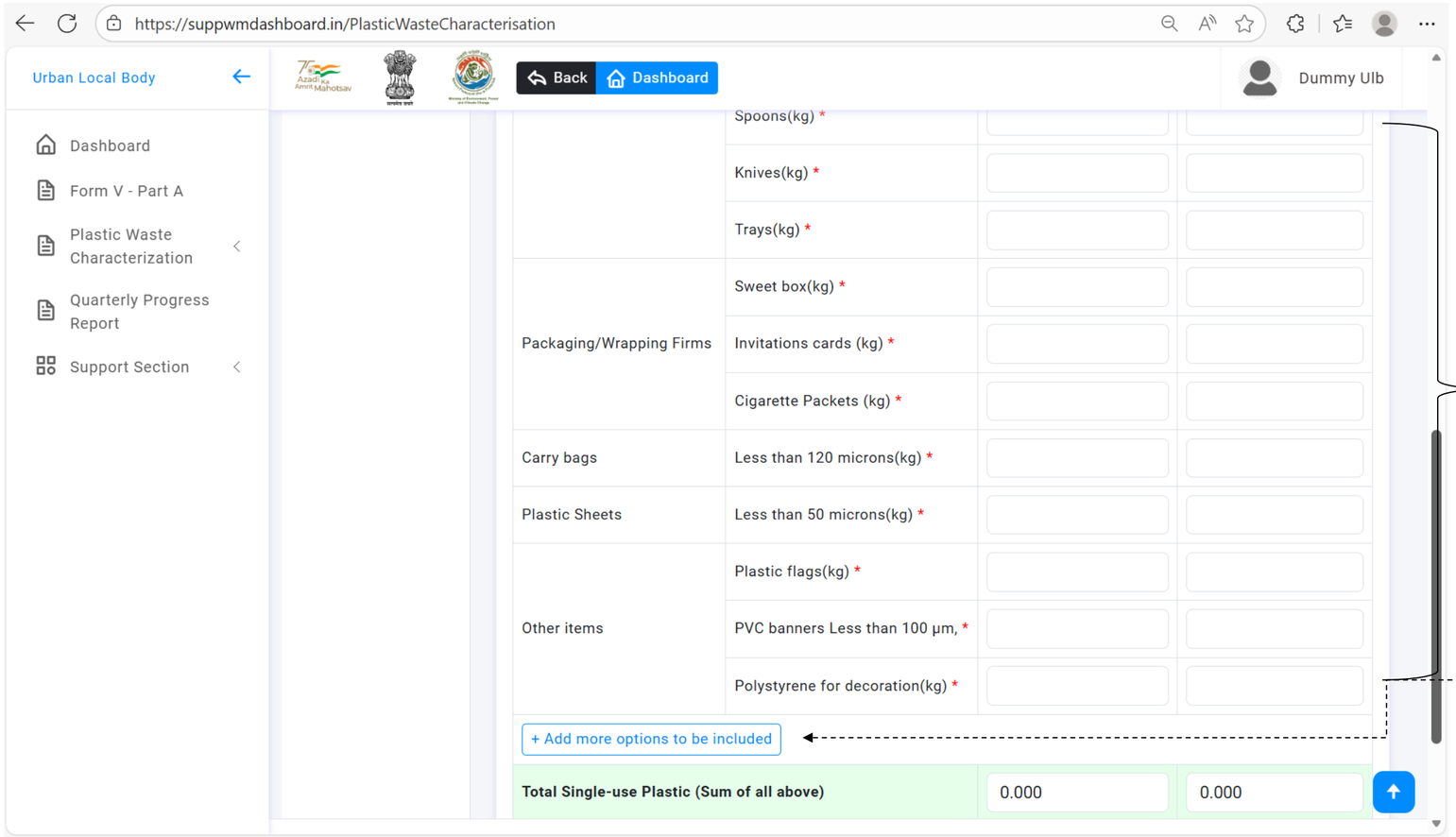


Enter Quantity of sample size in KGs from Generation & Disposal Points

Enter total quantity of plastic waste generated in KGs from Generation & Disposal Points

Enter quantity of Sub-category of SUP sampled from Generation & Disposal Point

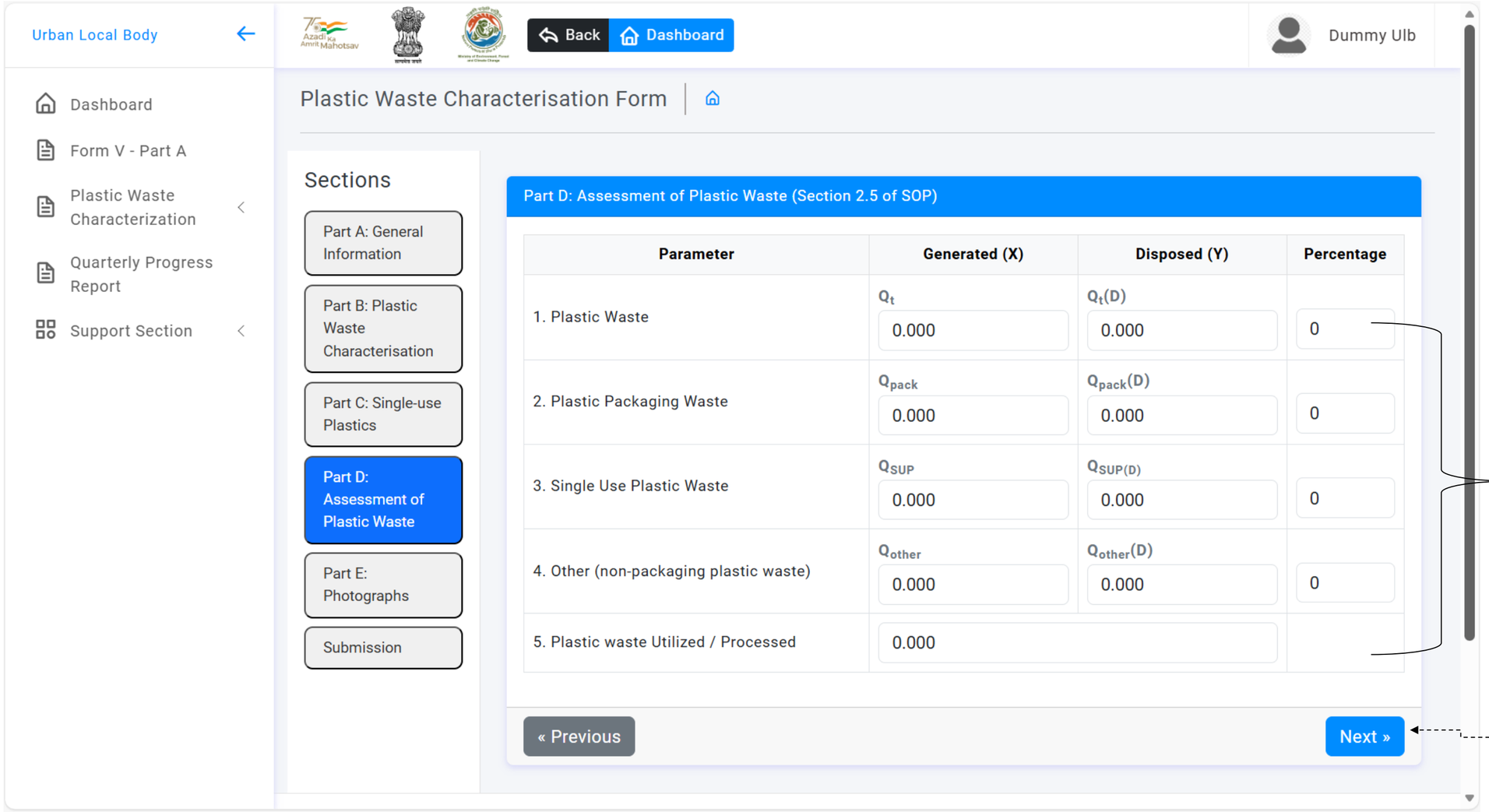
Section: Part C (Single Use Plastics) (2/2)



Enter quantity of Sub-category of SUP sampled from Generation & Disposal Point

Click on add more tab and enter the details if any other plastics banned by State Govt./ULBs

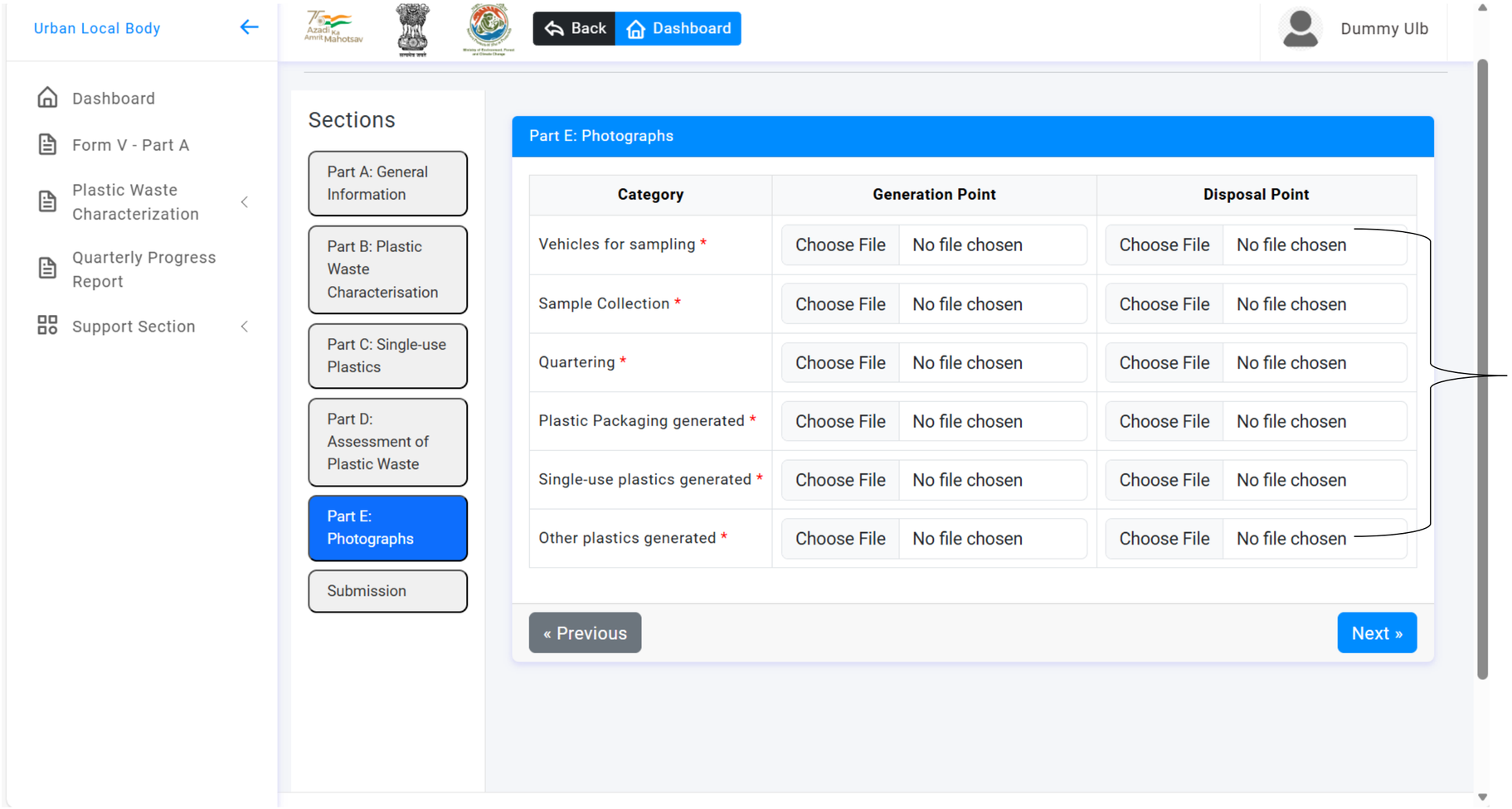
Section: Part D (Assessment of Plastic Waste) (1/3)



Auto-Populated Section based on inputs provided in section Part A to C

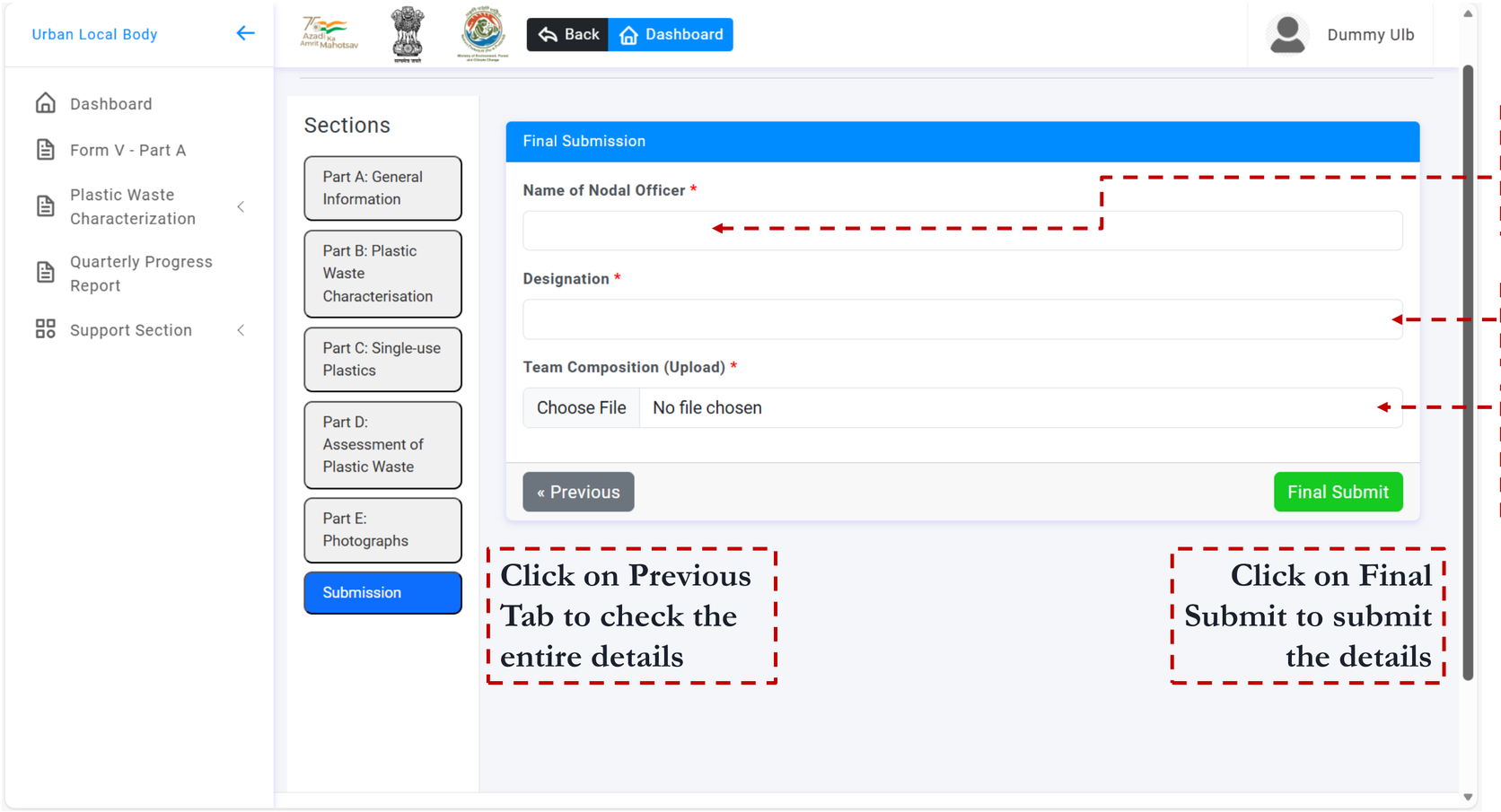
Click on Next

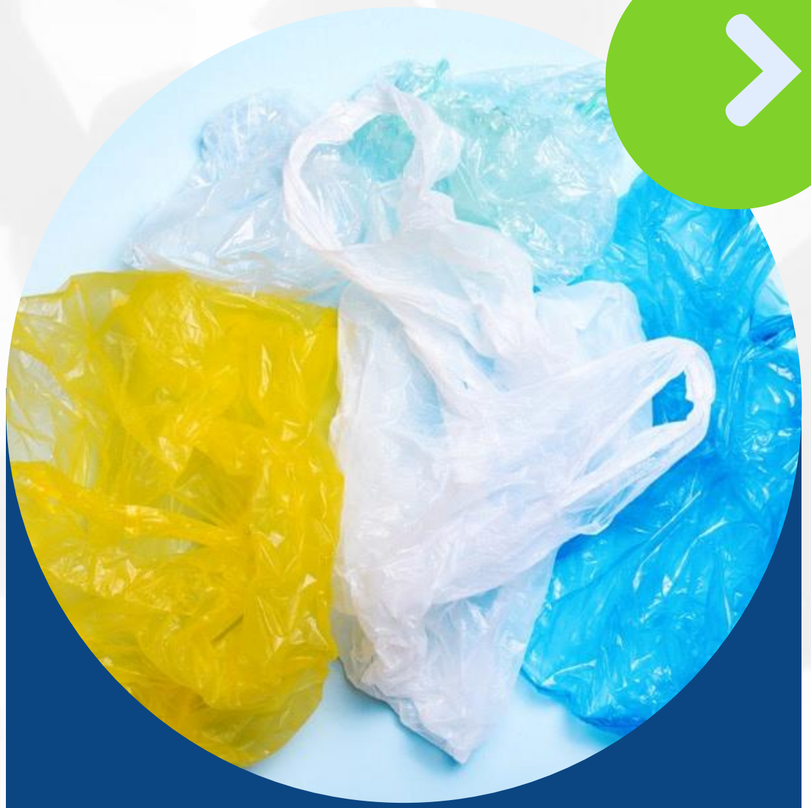
Section: Part D (Assessment of Plastic Waste) (2/3)



Upload photographs of vehicles sampling, sample collection, quartering, plastic packaging generated, SUP generated, Others plastics, if any

Section: Part D (Assessment of Plastic Waste) (3/3)





Module- 3
Waste Assessment through example (Analysis and Reporting)

Step-5

Essential aspects for analyzing the characterization data

Basic terminology / notation

- **Generation points** : Points from where waste is generated. It may include various residential areas based on income, commercial areas and mixed areas having both residential and commercial activities
- **Disposal points/sites**: Major waste disposal points/sites in a city could either be landfills collecting unsegregated waste or Material Resource Facilities (MRF) or a transfer point from where the waste is sent to final disposal sites.

- The excel tool is available separately to calculate plastic waste across different categories

Microsoft Excel
ro-Enabled Works

Types of calculation which will be appearing in the section:

01

Quantification of Plastic Waste generated:

- Total Plastic Waste Generated (Q_T)
- Packaging Plastic Waste Generated (Q pack)
- non-Packaging Plastic Waste Generated (Q other)

02

Quantity of Plastic Waste Disposed

- Total Plastic Waste Disposed (Q_{TD})
- Packaging Plastic Waste Disposed (Q packD)
- Plastic Waste Processed/Utilized (Q Utilized/processed)

03

SUP Plastic Waste Processed/Utilized

- Quantity of SUP plastic Waste Generated (Qsup)
- Quantity of SUP plastic Waste Disposed (Qsup) D

Plastic Waste Assessment – Excel Based Toolkit link

An Excel-based analytical tool has been developed for systematic data entry of key parameters, calculations, and to support decision-making for Urban Local Bodies (ULBs). Click on the below icon to open the tool.

Sr. No.	Parameters	Unit	Input Data
1	Total Solid Waste Generated	TPA	100000
2	Total Solid Waste Disposed	TPA	70000
3	Population	Nos.	100000

1	Total Number of MSW samples	Nos.	45
2	Total Number of sampling days if population < 100000	Nos.	MANUAL SELECT ↓
3	Total Number of sampling days if population >= 100000	Nos.	
3	Number of samples at Generation	Nos.	
4	Number of samples at Disposal point	Nos.	15

Legends	
	To be Filled
	Locked Cell
	Results
	Error

Add Row Del Row

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Plastic Waste characterization (Plastic Packaging category wise): Generation Points

Sr. No.	Vehicle Load size (MSW)	Sorting Sample Size (MSW)	Total Plastic waste Generated	Cat I	Cat II	Cat III	Cat IV	Cat V	Total Plastic Packaging Waste Generated
1	480	120.00	10	2.00	4.00	2.50	0.00	0.00	8.50
2	480	120.00	8	1.50	2.00	2.00	0.05	0.00	5.55
3	480	120.00	9	1.50	3.00	1.00	0.02	0.00	5.52
4	480	120.00	10	1.70	2.50	1.50	0.01	0.00	5.71
5	480	120.00	9	1.50	3.00	1.00	0.00	0.00	5.50
6	480	120.00	7	1.00	2.00	1.00	0.03	0.00	4.03
7	480	120.00	8.5	2.00	1.50	1.50	0.00	0.00	5.00
8	480	120.00	9	1.00	3.00	2.00	0.005	0.00	6.01
9	480	120.00	8	1.50	2.00	1.50	0.00	0.00	5.00
10	480	120.00	7	1.00	2.00	1.50	0.02	0.00	4.52
11	480	120.00	6.5	1.00	2.00	0.80	0.00	0.00	3.80
		0.00							0.00
				this row if left blank intentionally					
Total		1,320.00	92	15.70	27.00	16.30	0.14	0.00	59.14
Average			0.07	0.01	0.02	0.01	0.000	0.000	0.04

Results: Plastic Waste Generation		
Quantification		
Total Plastic waste generated	TPA	6969.697
Total Plastic packaging waste generated	TPA	4479.924
Category wise plastic packaging waste		
Cat I plastic packging waste	TPA	1189.394
Cat II plastic packaging waste	TPA	2045.455
Cat III plastic packaging waste	TPA	1234.848
Cat IV plastic packaging waste	TPA	10.22727
Cat V plastic packaging waste	TPA	0

Plastic Waste characterization (Plastic Packaging category wise): Disposal Points

Sr. No.	Vehicle Load size (MSW)	Sorting Sample Size (MSW)	Total Plastic waste Disposed	Cat I	Cat II	Cat III	Cat IV	Cat V	Total Plastic Packaging Waste
1	480	120.00	6	0.5	2	2	0.1	0	4.60
2	480	120.00	7	0.25	3	1	0	0	4.25
3	480	120.00	6.5	0.7	1	1	0	0	2.70
4	480	120.00	7	1	0.5	1	0.001	0	2.50
5	480	120.00	7.1	0.5	1	0.5	0	0	2.00
6	480	120.00	6.8	0.75	1.5	0.5	0	0	2.75
7	480	120.00	6	0.5	2	2	0.01	0	4.51
8	480	120.00	7	0.25	3	1	0	0	4.25
9	480	120.00	6.5	0.7	1	1	0	0	2.70
10		0.00							0.00
				this row if left blank intentionally					
Total		1,080.00	59.90	5.15	15.00	10.00	0.11	0.00	30.26
Avearage			0.06	0.00	0.01	0.01	0.000	0.000	0.03

Results: Plastic waste Disposed		
Qunatification		
Total Plastic waste disposed	TPA	3882.407
Total Plastic packaging waste disposed	TPA	1961.361
Category wise plastic packaging waste		
Cat I plastic packging waste	TPA	333.7963
Cat II plastic packaging waste	TPA	972.2222
Cat III plastic packaging waste	TPA	972.2222
Cat IV plastic packaging waste	TPA	7.194444
Cat V plastic packaging waste	TPA	0

Add + Rows

Note: To open the excel toolkit, press double click

List of Notations:

NOTATION	DESCRIPTION
GENERATION	
Q T	Quantity of Plastic waste generated (TPA)
Q pack	Quantity of Plastic packaging waste generated (TPA)
Q other	Quantity of non-packaging plastic waste generated (TPA)
DISPOSAL	
QTD	Quantity of Plastic waste disposed (TPA)
Qpack D	Quantity of Plastic Packaging Waste Disposed (TPA)
Q Utilized/processed	Quantity of Plastic Waste Processed/Utilized (TPA)
Qother D	Quantity of other (Non-packaging waste) Disposed= QTD-QpackD
SUP PLASTIC WASTE PROCESSED/UTILIZED	
Qsup	Quantity of SUP plastic Waste Generated (TPA)
Qsup D	Quantity of SUP plastic Waste Disposed (TPA)

List of Notations:

NOTATION	DESCRIPTION
Plastic Waste Assessment - Generation Points	
Q	Quantity of Mixed Municipal Solid Waste generated (TPA) in ULB
Q1	Average Quantity of Plastic Waste Generated (kg/kg)
Q2	Average Quantity of Packaging Plastic Waste Generated (kg/kg)
Quantity of Plastic Waste Disposed (Total Plastic Waste Disposed, Packaging Plastic Waste Disposed, Non-Packaging Plastic Waste Processed/Utilized)	
Q1d	Average Quantity of Plastic Waste Disposed (kg/kg)
Q2d	Average Quantity of Packaging Plastic Waste Disposed (kg/kg)
QD	Quantity of Mixed Waste disposed (TPA) by ULB
Total Mix Waste Generated	
Q	Quantity of Mixed Waste generated (TPA)

Plastic Waste Assessment - Generation Points

Table 5: Calculation for Assessment of Plastic Packaging Waste at Generation Point

Vehicle Load No. (1)	Sorting Sample Size (Kg) (2)	Total Plastic Waste (Kg) (3)	Category 1 Plastic Waste (kg) (4)	Category 2 Plastic Waste (kg)(5)	Category 3 Plastic Waste (kg) (6)	Category 4 Plastic Waste (kg) (7)
1						
2						
3						
…						
n						
Total	Σ (row 1..n)	Σ (row 1..n)	Σ (row 1..n)	Σ (row 1..n)	Σ (row 1..n)	Σ (row 1..n)
Average (kg/kg)		Σ (Column 3)/ Σ (Column 2)	Σ (Column 4)/ Σ (Column 2)	Σ (Column 5)/ Σ (Column 2)	Σ (Column 6)/ Σ (Column 2)	Σ (Column 7)/ Σ (Column 2)

n = nth Vehicle Load number

Plastic Waste Assessment - Generation Point (Example)

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Table 6: Example of Assessment of Plastic Waste at Generation Point

Vehicle Load No. (1)	Vehicle Load (kg) (2)	Sorting Sample Size (Kg) (3)	Total PW (Kg) (4)	Category-1 PW (kg) (5)	Category-2 PW (kg) (6)	Category-3 PW (kg) (7)	Category-4 PW (kg) (8)	Total Packaging Waste in all categories (kg) (9)
1	480	120	10	2	4	2.5	0	8.5
2	480	120	8	1.5	2	2	0.05	5.55
3	480	120	9	1.5	3	1	0.02	5.52
4	480	120	10	1.7	2.5	1.5	0.01	5.71
5	480	120	9	1.5	3	1	0	5.5
6	480	120	7	1	2	1	0.03	4.03
7	480	120	8.5	2	2	1.5	0	5.5
8	480	120	9	1	3	2	0.005	6.005
9	480	120	8	1.5	2	1.5	0	5
10	480	120	7	1	2	1.5	0.02	4.52
11	480	120	6.5	1	2	0.8	0	3.8
12	480	120	10	3	2	1	0.02	6.02
13	480	120	9	1.5	4	1	0.02	6.52
14	480	120	10	1.7	4	1.5	0.01	7.21
15	480	120	9.5	1.5	3	1	0	5.5
16	480	120	8.5	1	2	1	0.03	4.03
17	480	120	10	2	2	2	0	6
18	480	120	9	1	3	2	0.005	6.005
19	480	120	11	2.5	3	2	0	7.5
20	480	120	7	1	2	1.5	0.02	4.52
21	480	120	8	1	2	1.5	0	4.5
Total		**2520**	**184**	**31.9**	**54.5**	**30.8**	**0.24**	**117.44**

Quantification of Plastic Waste generated (Total Plastic Waste, Packaging Plastic Waste and non-Packaging Plastic Waste

Q1 : Average quantity of plastic waste generated (kg/kg) = **Σ (Column 3)/ Σ (Column 2)**

Q2 : Average quantity of plastic packaging waste generated (kg/kg) = **(Σ (Column 4)+Σ (Column 5)+Σ (Column 6)+Σ (Column 7))/ (Σ (Column 2)**

Q : Quantity of Mixed Municipal Solid Waste generated (TPA) in ULB

Refer Table 5

Results:

Q T : Quantity of Plastic waste generated (TPA) = Q * Q1

Q pack: Quantity of Plastic packaging waste generated (TPA) = Q * Q2

Q other: Quantity of non-packaging plastic waste generated (TPA) = Q T-Q pack

Quantity of Plastic Waste Generated - Example

- Considering Quantity of Mixed Waste generated in the town (TPA) (Q) = 1,00,000 Tons per annum

- Quantity of Plastic Waste Generated (TPA) (Q_T) = Q*Q1 = 1,00,000 x (184/2520) = 7,301 Ton per Annum (Refer Table 6)
  - Quantity of Plastic Packaging Waste Generated (TPA)=Qpack=Q2*Q
    - = (117.44/2520)x100000
    - = 4,660 Tons per Annum
  - Quantity of non-Packaging Plastic Waste generated= Qother=Q_T-Qpack
    - = 7301 - 4660
    - =2641 Tons per Annum

Plastic Waste Assessment - Disposal Points

Table 7: Calculation for Assessment of Plastic Packaging Waste at Disposal Point

Vehicle Load No. (1)	Sorting Sample Size (Kg) (2)	Total Plastic Waste (kg) (3)	Category 1 Plastic Waste (kg) (4)	Category 2 Plastic Waste (kg) (5)	Category 3 Plastic Waste (kg) (6)	Category 4 Plastic Waste (kg) (7)
1						
2						
3						
…						
n						
Total	Σ (row 1..n)	Σ (PW)	Σ (Cat I)	Σ (Cat II)	Σ (Cat III)	Σ (Cat IV)
Average (kg/kg)		Σ (Column 3)/ Σ (Column 2)	Σ (Column 4)/ Σ (Column 2)	Σ (Column 5)/ Σ (Column 2)	Σ (Column 6)/ Σ (Column 2)	Σ (Column 7)/ Σ (Column 2)

n = nth Vehicle Load number

Plastic waste Assessment: Disposal Points – Example

Toolkit Link

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Table 8: Example for Assessment of Plastic Packaging Waste at Disposal Point

Vehicle Load No. (1)	Vehicle Load (kg) (2)	Sorting Sample Size (Kg) (3)	Total PW(Kg) (4)	Category- 1 PW (kg) (5)	Category -2 PW (kg)(6)	Category -3 PW(Kg) (7)	Category -4 PW (kg) (8)	Total Packaging Waste in all categories (kg) (9)
1	480	120	6	0.5	2	2	0.01	4.51
2	480	120	7	0.25	3	1	0	4.25
3	480	120	6.5	0.7	1	1	0	2.7
4	480	120	7	1	0.5	1	0.001	2.501
5	480	120	7.1	0.5	1	0.5	0	2
6	480	120	6.8	0.75	1.5	0.5	0	2.75
7	480	120	6	0.5	2	2	0.01	4.51
8	480	120	7	0.25	3	1	0	4.25
9	480	120	6.5	0.7	1	1	0	2.7
10	480	120	7	1	0.5	1	0.001	2.501
11	480	120	7.1	0.5	1	0.5	0	2
12	480	120	6.8	0.75	1.5	0.5	0	2.75
13	480	120	6	0.5	2	2	0.01	4.51
14	480	120	7	0.25	3	1	0	4.25
15	480	120	6.5	0.7	1	1	0	2.7
16	480	120	7	1	0.5	1	0.001	2.501
17	480	120	7.1	0.5	1	0.5	0	2
18	480	120	6.8	0.75	1.5	0.5	0	2.75
19	480	120	6	0.5	2	2	0.01	4.51
20	480	120	7	0.25	3	1	0	4.25
21	480	120	6.5	0.7	1	1	0	2.7
22	480	120	7	1	0.5	1	0.001	2.501
23	480	120	7.1	0.5	1	0.5	0	2
24	480	120	6.8	0.75	1.5	0.5	0	2.75
Total		**2880**	**161.6**	**14.8**	**36**	**24**	**0.044**	**74.844**

Note: To open the excel toolkit follow the link, press CTRL+ Click

Quantity of Plastic Waste Disposed (Total Plastic Waste Disposed, Packaging Plastic Waste Disposed, Non-Packaging Plastic Waste Processed/Utilized)

Q1d: Average quantity of plastic waste disposed (kg/kg) = **(ΣColumn 3) / (Σ Column 2)**

Q2d: Average quantity of plastic packaging waste disposed (kg/kg) = **(Σ (Column 4) +Σ (Column 5) +Σ (Column 6) + Σ (Column 7)) / (Σ (Column 2)**

Q_D: Quantity of Mixed Waste disposed (TPA) by ULB — Refer Table 6

Results:

- **Quantity of Plastic waste disposed (Q_{TD})(TPA) = $Q1_d * Q_D$**
- **Quantity of Plastic Packaging Waste Disposed ($Q_{pack\ D}$) (TPA) = $Q2_d * Q_D$**
- **Quantity of other (Non-packaging waste) Disposed=$Q_{other\ D} = Q_{TD} - Q_{pack\ D}$**

And,

- **Quantity of Plastic waste Utilised/Processed=$Q_{utilised/processed} = Q_T - Q_{TD}$**

Quantity of Plastic Waste Disposed (Total Plastic Waste Disposed, Packaging Plastic Waste Disposed, Packaging Plastic Waste Processed/Utilized)-Example

Total Plastic Waste Disposed (Refer table 8)

- **Quantity of Plastic waste disposed (Q_{TD})(TPA) = $Q1_d * Q_D$**
- Q1d**:** Average quantity of plastic waste disposed = (ΣColumn 3) / (Σ Column 2)
  = (161.6/2880)
  =0.0561
  - Considering Quantity of Mixed Waste Disposed (TPA) (QD)= 35000 TPA
  - Quantity of Plastic Waste Disposed (TPA) (QTD) = Q1d*QD
    = 35000 x (161.6/2880)
    = 1963.88 Ton per Annum

Packaging/Non-Packaging Plastic Waste Disposed

- **Quantity of Plastic Packaging Waste Disposed ($Q_{pack\ D}$) (TPA) = $Q2_d * Q_D$**
- Q2d : Average quantity of plastic packaging waste disposed = (Σ (Column 4) +Σ (Column 5) +Σ (Column 6) + Σ (Column 7)) / (Σ (Column 2)
  = (74.844/2880)
  =0.02598
  - Considering Quantity of Mixed Waste Disposed (TPA) (QD)= 35000 TPA
  - Quantity of Plastic packaging Waste Disposed (TPA) (QTD) = Q2d*QD
    = 35000 x (74.844/2880)
    = 909.56 Ton per Annum

- **Non-Packaging Plastic waste Disposed=$Q_{other\ D}$=QTD-$Q_{pack\ D}$**
  =1963.88-909.56=1054.32 Tons per annum
- **Plastic Waste Processed/Utilized**
- Plastic Waste Processed/Utilized=$Q_{utilised/processe}$ = QT-QTD
  = 7301-1963.88
  = 5337.12 tons per Annum

SUP Assessment – Generation point (1/2)

Table 9: Calculation for Assessment of SUP at Generation Point

Sr. No.	SUP Items	Sr. No.	SUP Items subcategory	Vehicle Load No. 1 (kg)	Vehicle Load No. 2 (kg)	…	…	Vehicle Load No. N (kg)	Total ∑	Average (kg/kg)
1		**a**	Sorting Sample size (kg)						∑ (Row 1a)	
		b	Plastic Waste (kg)						∑ (Row 1b)	∑Row 1b/∑Row 1a
2	**Plastic Sticks**	**a**	Earbuds(kg)						∑ (Row 2a)	∑Row 2a/∑Row 1a
		b	Balloons(kg)						∑ (Row 2b)	∑Row 2b/∑Row 1a
		c	Candy(kg)						∑ (Row 2c)	∑Row 2c/∑Row 1a
		d	Ice-cream(kg)						∑ (Row 2d)	∑Row 2d/∑Row 1a
		e	Straws(kg)						∑ (Row 2e)	∑Row 2e/∑Row 1a
3	**Cutlery items**	**a**	Plates(kg)						∑ (Row 3a)	∑Row 3a/∑Row 1a
		b	Cups(kg)						∑ (Row 3b)	∑Row 3b/∑Row 1a
		c	Glass(kg)						∑ (Row 3c)	∑Row 3c/∑Row 1a

SUP Assessment – Generation point (2/2)

Table 10: Calculation for Assessment of SUP at Generation Point (Contd.)

Sr. No.	SUP Items	Sr. No.	SUP Items subcategory	Vehicle Load No. 1 (kg)	Vehicle Load No. 2 (kg)	…	…	Vehicle Load No. N (kg)	Total ∑	Average (kg/kg)
3	**Cutlery items**	**d**	Forks(kg)						∑ (Row 3d)	∑Row 3d/∑Row 1a
		e	Spoons(kg)						∑ (Row 3e)	∑Row 3e/∑Row 1a
		f	Knives(kg)						∑ (Row 3f)	∑Row 3f/∑Row 1a
		g	Trays(kg)						∑ (Row 3g)	∑Row 3g/∑Row 1a
4	**Packaging/Wrapping Firms**	**a**	Sweet box(kg)						∑ (Row 4a)	∑Row 4a/∑Row 1a
		b	Invitations cards (kg)						∑ (Row 4b)	∑Row 4b/∑Row 1a
		c	Cigarette Packets (kg)						∑ (Row 4c)	∑Row 4c/∑Row 1a
5	**Carry bags**	**a**	<120 microns(kg)						∑ (Row 5a)	∑Row 5a/∑Row 1a
6	**Plastic Sheets**	**a**	<50 microns(kg)						∑ (Row 6a)	∑Row 6a/∑Row 1a
7	**Other items**	**a**	Plastic flags(kg)						∑ (Row 7a)	∑Row 7a/∑Row 1a
		b	PVC banners < 100 μm						∑ (Row 7b)	∑Row 7b/∑Row 1a
		c	Polystyrene for decoration(kg)						∑ (Row 7c)	∑Row 7c/∑Row 1a

SUP Assessment – Generation point (Example)

Toolkit Link

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Table 11: Example for Assessment of SUP at Generation Point

Sorting Sample Size (kg) (1)	Vehicle Load No.1 (kg)	Vehicle Load No.2(kg)	VL3…	VL21	Total (kg)	Average Kg/Kg of waste
Sorting Sample Size (kg)	120	120	120	120	2520	
Plastic Waste (kg)	10	8	9	8	184	0.07302
SUPs						
Earbuds(kg)	0.0001	0.0002	0	0.0001	0.00185	0
Balloons(kg)	0.001	0	0	0.001	0.006	0
Candy(kg)	0.01	0	0	0.01	0.061	0.00002
Ice-cream(kg)	0.02	0.01	0	0.02	0.17	0.00007
Straws(kg)	0.15	0.14	0.1	0.15	2.65	0.00105
Plates(kg)	0.2	0.18	0.2	0.2	4	0.00159
Cups(kg)	0.21	0.15	0.1	0.21	3.31	0.00131
Glass(kg)	0.17	0.15	0.2	0.17	3.42	0.00136
Forks(kg)	0.1	0.05	0.1	0.1	1.45	0.00058
Spoons(kg)	0.08	0.07	0.1	0.08	1.23	0.00049
Knives(kg)	0.05	0.03	0	0.05	0.6	0.00024
Trays(kg)	0.02	0.015	0	0.02	0.315	0.00013
Sweet box(kg)	0.001	0	0	0.001	0.01	0
Invitation cards (kg)	0.0001	0	0	0.0001	0.0006	0
cards						
Cigarette (kg) Packets	0.002	0.001	0	0.002	0.027	0.00001
<120 micron (kg)	1.5	1.2	1	1.5	25	0.00992
<50 micron(kg)	1	0.8	1.1	1	21	0.00833
Plastic flags (kg)	0.0001	0.0002	0	0.0001	0.0016	0
PVC banners<100 µm	0.001	0	0	0.001	0.006	0
polystyrene fordecoration (kg)	0.02	0.01	0	0	0.19	0.00008
Total	**3.5353**	**2.80635**	**2.88**	**3.5153**	**63.44905**	

Note: To open the excel toolkit follow the link, press CTRL+ Click

SUP Assessment - Disposal Point (Example)

Toolkit Link

Microsoft Excel
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Table 12: Example for Assessment of SUP at Disposal Point

Sorting Sample Size (kg) (1)	Vehicle Load No.1 (kg)	Vehicle Load No.2(kg)	VL3…	VL24	Total (kg)	Average Kg/Kg of waste
Sorting Sample Size (kg)	120	120	120	120	2880	
Plastic Waste (kg)	10	8	9	8	161.6	
SUPs						
Earbuds(kg)	0.0001	0.0002	0	0.00012	0.00222	0
Balloons(kg)	0.0002	0	0.001	0.0001	0.0078	0
Candy(kg)	0.005	0	0.0001	0.001	0.0366	0.0001
Ice-cream(kg)	0.01	0.015	0	0.015	0.24	0.001
Straws(kg)	0.15	0.14	0.1	0.09	2.88	0.0012
Plates(kg)	0.12	0.18	0.15	0.14	3.54	0.0013
Cups(kg)	0.18	0.15	0.12	0.15	3.6	0.001
Glass(kg)	0.11	0.14	0.15	0.1	3	0.0005
Forks(kg)	0.05	0.05	0.05	0.07	1.32	0.0005
Spoons(kg)	0.08	0.07	0.03	0.08	1.56	0.0003
Knives(kg)	0.05	0.03	0.01	0.05	0.84	0.0001
Trays(kg)	0.01	0.015	0.012	0.01	0.282	0
Sweet box(kg)	0.001	0	0.0002	0.001	0.0132	0
Invitation cards (kg)	0.0001	0	0	1.00E-04	0.0012	0
Cigarette (kg) Packets	0.0001	0.0002	0.0001	1.00E-04	0.003	0.0095
<120 micron (kg)	1.2	1.1	1	1.25	27.3	0.0076
<50 micron(kg)	0.7	0.8	1.15	1	21.9	0
Plastic flags (kg)	0.0001	0	0	1.00E-04	0.0012	0
PVC banners<100 µm	0.0001	0	0	1.00E-04	0.0012	0
polystyrene fordecoration (kg)	**0.002**	**0.001**	**0.001**	**0**	**0.024**	0.0231
Total	**2.6687**	**2.69135**	**2.7744**	**2.95762**	**66.55242**	**0.0561**

Note: To open the excel toolkit follow the link, press CTRL+ Click

Toolkit Link

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Quantity of SUP Generated and Disposed

Quantity of SUP Waste Generation

- Average quantity of SUP waste generated (SUP in kg / kg of mixed waste) Q3 = (∑ (Row 2a… 7c) / (∑ (Row 1a) (refer Table – 09 & 10)
- Quantity of Mixed Waste generated (TPA) = Q
- Quantity of SUP Waste Generated (TPA) (QSUP) = Q3*Q
- Quantity of SUP Waste at Disposal
- Average quantity of SUP waste at Disposal (SUP in kg / kg of mixed waste)
- Q3d= (∑ (Row 2a… 7c) / (∑ (Row 1a)
- Quantity of Mixed Waste Disposed (TPA) = Q_D
- Quantity of SUP Waste Disposed (TPA) $(Q_{SUP})_D = Q3_d * Q_D$

Note: To open the excel toolkit follow the link, press CTRL+ Click

Quantity of SUP Generated and Disposed - Example

Quantity of SUP Plastic Waste Generated

- Average quantity of SUP waste generated (SUP in kg / kg of mixed waste) Q3 = (∑ (Row 2a… 7c) / (∑ (Row 1a) (refer Table-11)=Q3
  =63.44905/2520
  = 0.02517
- Quantity of Mixed Waste generated (TPA) =Q=1,00,000 tons per annum
- Quantity of SUP Plastic Waste Generated (TPA) (QSUP) = Q3*Q
- 100000X (63.44905/2520)
- 2517.819 Tons per Annum

Quantity of SUP Plastic Waste Disposed

- Average quantity of SUP waste Disposed (SUP in kg / kg of mixed waste) (Q3d) = (∑ (Row 2a… 7c) / (∑ (Row 1a) (refer Table-12)
  = 66.552/2880
  =0.0231
- Quantity of Mixed Waste Disposed (TPA) =Q_D= 35000 Ton per Annum
- Quantity of SUP Waste Disposed (TPA) (QSUP)D = Q3d*QD
  = 35000X(66.552/2880)
  =808.79 Ton per Annum

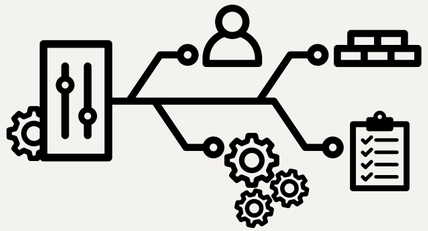
Toolkit Link

Microsoft Excel
ro-Enabled Works

Note: To open the excel toolkit follow the link, press CTRL+ Click

Step-5
Module-4
Consolidation and Validation of Assessed Values

Validation of plastic waste data by SPCB/PCC as per SOP



ULBs shall follow the methodology detailed in the SOP in their jurisdiction.

ULBs shall inform the schedule of Assessment to the SPCBs/PCCs well in advance.

SPCBs/PCCs shall join the Assessment process, to validate the methodology adopted for the assessment as well as the data reported by ULBs.

Validation of plastic waste data by SPCBs/PCCs as per SOP

Table 13: Validation Points to be followed by SPCB/ PCC

Sr. No.	Items	Remarks
1	Total No. of Local Bodies in State/ UT	
2	No. of Local Bodies which have confirmed adoption of CPCB Assessment & Characterization Methodology	
3	No. of Local bodies in which SPCB/PCC joined the Assessment for confirmation of Point (2) above	
4	No. of Local Bodies in which SPCB/PCC Not joined the Assessment , confirming Point (2) above	
5	No. of Local Bodies in which of Quantity Plastic waste reported was verified by SPCB/PCC.	
6	No. of Local Bodies found in compliance as per Point (5) above	
7	No. of non-complying Local Bodies as per Point (5) above, in which reported data was reconciled by SPCB/PCC	

Assessment and Characterization of plastic waste by SPCBs/PCCs as per SOP

Table 14: Assessment and Characterization Points for SPCB and PCC

Sr. No.	Local Body	Total Plastic Waste generated	Quantity of SUP waste generated	Quantity of Plastic Packaging generated	Quantity of other (Non-Packaging plastic waste) generated	Quantity of plastic waste disposed	Quantity of plastic packaging disposed	Quantity of SUP waste disposed	Quantity of Plastic waste processed Qprocess (TPA)
(1)	(2)	(3)	(4)	(5)	(6) = (3) – (5)	(7)	(8)	(9)	(10)
1	Local body 1	QT	QSUP	Qpack	Qother	QTD	Q(pack)D	Q(SUP)D	(Column 3) – (Column 7)
2	Local body 2								
3	Local body 3								
…	…	…	…	…	…	…	…	…	…
TOTAL		∑Column 3	∑Column 4	∑Column 5	∑Column 6	∑Column 7	∑Column 8	∑Column 9	∑Column 10

Assessment and Characterization of plastic waste by SPCBs/PCCs - Example

Table 15: Example for Validation by SPCB/ PCC

Sr. No.	Local Body	Total Plastic Waste generated	Quantity of SUP waste generated	Quantity of Plastic Packaging generated	Quantity of other (Non-Packaging plastic waste) generated	Quantity of plastic waste disposed	Quantity of plastic packaging disposed	Quantity of SUP waste disposed	Quantity of Plastic waste processed Qprocess (TPA)
(1)	(2)	(3)	(4)	(5)	(6) = (3) – (5)	(7)	(8)	(9)	(10)
1	Local Body 1	60,000	10,000	30,000	30,000	24,000	12,000	4,000	36,000
2	Local Body 2	65,000	11,500	35,000	30,000	26,000	14,000	4,600	39,000
3	Local Body 3	70,000	13,000	40,000	30,000	28,000	16,000	5,200	42,000
TOTAL		**1,95,000**	**34,500**	**1,05,000**	**90,000**	**78,000**	**42,000**	**13,800**	**1,17,000**

Illustrative

Thank You!