भारत सरकार
GOVERNMENT OF INDIA

लद्दाख का राजपत्र
The Ladakh Gazette

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Part II-Section 1

केन्द्र-शासित प्रदेश लद्दाख प्रशासन
ADMINISTRATION OF UNION TERRITORY OF LADAKH

NOTIFICATION

Ladakh, Thursday, November, 10th, 2022

Ladakh UT-level Waste Management Policies

S.O.121**-** Whereas the Government of India had issued the Solid Waste Management Rules 2016, Plastic Waste Management Rules 2016 and Construction and Demolition Rules, 2016.

Now in accordance with the same, the following waste management policies are being notified in compliance with Rule 11 (a) and Rule 13 of Solid Waste Management

Rules, 2016; Plastic Waste Management Rules, 2016, and Rule 9 (1) of Construction and Demolition Waste Management Rules, 2016:

1. Solid Waste Management Policy, Strategy & Action Plan, September, 2022. **(Annexure-A).**
2. Plastic-Smart Urban Ladakh Strategy and Action Plan, September, 2022. **(Annexure-B).**
3. Policy and Strategy on Management of Construction and Demolition Waste, September, 2022. **(Annexure-C).**

Terms of Reference:

1. The policies shall be read in conjunction with the Solid Waste Management Rules, 2016, Plastic Waste Management Rules, 2016 and Construction and Demolition Waste Management Rules,2016
2. The waste management policies shall act as the guiding principles for waste management in the respective jurisdictions and shall base the formulation of further rules and guidelines for waste management in the UT of Ladakh.
3. The respective scope of work has been mentioned in the respective documents, however, similar policies, guidelines, strategies, and action plans may be formulated by other jurisdictions, based on these policies.

It is further notified here that the Housing and Urban Development Department shall be the nodal department for Waste Management of the aforementioned policies and respective rules in line with the Solid Waste Management Rules, 2016.

SANJEEV KHIRWAR

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संजीवखिरवार) आईएएस, Sanjeev Khirwar(IAS),

प्रमुखसचिव,Principal/Secretary,

आवासएवंशहरीविकासविभाग,Housing & Urban Development Department.

AJEET KUMAR SAHU

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ANNEXURE-A

Solid Waste Management Policy, Strategy & Action Plan

Union Territory of Ladakh

SEPTEMBER 20, 2022

Housing & Urban Development Department

Executive Summary

Ladakh already had a SWM Policy, and Strategy prepared in 2017 under the aegis of J&K. However, Ladakh has come a long way in terms of its focus to implement solid waste and sanitation programmes in a comprehensive and outcome-oriented manner since it became a UT on 31st October 2019.

Ladakh's most threatening impact towards the region is improper solid waste disposal. With significant influx of tourists, solid waste has become a major problem for the authorities and residents. Thus, formulation of a comprehensive SWM Policy has become inevitable to regulate and manage the quantity of waste being generated and disposed unscientifically.

This policy will be applicable and binding upon all the urban local bodies (including census towns, notified areas), rural local bodies (including revenue villages and hamlets), development authorities, other UT and central government departments, establishments, line agencies and public offices. The policy is limited to Solid Waste Management & Plastic Waste Management. However, collection of E-Waste, Construction and Demolition Waste and Domestic Hazardous Waste from public is envisaged in the document. Bio medical Waste and Radioactive Waste require higher technical know-how and protocols for its safe handling. Thus, it is recommended to form a separate policy pertaining to the same.

The key users of this policy will include all the Government departments of Union Territory of Ladakh, Urban Local Bodies, Gram Panchayats, LAHDC, waste management contractors and agencies, Recyclers and Bulk waste generators (institutional, commercial).

The objectives of the SWM can be summarised as follows:

- To achieve "Zero waste" status by 2030 through sustainable interventions, innovations, and technology
- 100% segregation of residential and commercial waste at source along with processing of the segregated waste
- 100% door-to-door collection of solid waste from all properties including industrial units outside designated industrial estates
- Integrated Waste Management (Centralized and Decentralized) for Biodegradable and Non-Biodegradable waste leading to minimum disposal at Sanitary Landfill
- Management of C&D waste and recycling
- Elimination of any secondary waste collection points to achieve the vat-free city
- Achieving and sustaining high Swacchata and GFC ranking in national level

- SWM infrastructure compatible to extreme cold/dry climate

Some differentiating strategies that may be incorporated in the Union Territory of Ladakh are:

- **Mainstreaming Climate Change & Net-zero aspirations of Ladakh**
  - Bio-mining and capping of the legacy landfill sites will be done to stop methane emission.
  - Use of E-vehicles for collection and transportation of waste.
  - Utilization of Renewable energy in the processing and treatment plants.
  - Emission monitoring system will be set up
  - This policy will be in line with the Carbon Neutral Development of Ladakh

- **Cluster-based Approach considering dispersed and scanty settlements and Urban Rural Continuum:** Urban + Rural; Rural + Rural
  - Provisioning for the Future: Construction and Demolition Waste Management System (<500000 population)
- **Provision of Circular Economy and Waste to Wealth**
  - Selling of compost
  - Promotion of urban agriculture
  - Engagement of rag pickers in dry waste sorting and recycling
  - Engagement of self-help groups and local entrepreneurs/start-ups in making products

- **Focus on Tourism and Hospitality Industry**
  - The local bodies will charge tourists at entry points to sustain SWM service at tourist destinations.
  - Penalising based on 'Pay-as-you-throw' (PAYT) scheme to be implemented by the MCs.
  - Interception of single use plastic at all entry points to Ladakh.

- **Hybrid Process:** Combination of centralized and decentralized processing and treatment
  - Source level Systems
  - Cluster / Community Level Systems: Horticulture and garden wastes, market wastes
  - Common Facility – UT will establish a district level, a Regional Resource Recovery Centres (RRRCs) with the following functions:

- Receive segregated non-bio-degradable discards from bulk waste generators which can be handled at MRFs
- Receive processed or semi processed bio-degradable discards from MRFs for final processing and composting
- Receive segregated non-bio-degradable discards from MRFs and process them for recovery
- Aggregate recyclables to process for recycling, channelize inert, compost rejects, sanitary waste and residuals to landfill; channelize construction demolition waste to holding facility, channelize hazardous and E-Waste to authorized service providers.
- Common Facility will not receive any type of waste from public directly.

Key Activities & Milestones

The UT Administration of Ladakh is taking up following time-bound actions to achieve sanitation goals:

Sl. #	Key Activities & Milestones	*Time limit w.e.f. 1st May 2022
1	Finalization of all related policies, bye-laws at the UT and Local Level	months
2	Setting up of all the Committees/Taskforces at the UT and Local Level	months
3	Identification and procurement of suitable sites, including obtaining necessary environmental clearances, for setting up solid waste processing facility and sanitary landfill facilities	months
4	Engagement of a UT level agencies for IEC/BCC and	months

	Capacity Building	
5	Engagement of Consultants for preparing DPRs	months
6	Enforcing waste generators to practice segregation of bio-degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source	months
7	Completion of procurement of bins, C&T vehicles, PPE kits as may be estimated in the DPRs	months
8	Completion of commissioning of all SWM processing plants, MRFs and SLF	year
9	Ensuring 100% door-to-door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	year
10	Ensuring 100% separate storage, collection and transportation of construction and demolition wastes	years
11	Ensuring 100% separate storage, collection, and transportation of bio-medical wastes in collaboration with the Health Department and PCC	years
12	Completion of Bioremediation or capping of old and abandoned dump sites	ears

Commonly Used Abbreviations

ABS: Area Based System
AD: Anaerobic Digestion
BCC: Behaviour Change Communication
C&D: Construction & Demolition
CAA: Constitutional Amendment Act
CBOs: Community Based Organizations
CPCB: Central Pollution Control Board
CPHEEO: Central Public Health and Environmental Engineering Organization
CPWD: Central Public Works Department
CSI: City Sanitary Inspector
CSP: City Sanitation Plan
D2D: Door-to-door
DPR: Detailed Project Report
EIA: Environment Impact Assessment
EMP: Environmental Management Plan
EPR: Extended Producer Responsibility
GDP: Gross Domestic Product
GHG: Green House Gas GIS Geographic Information System
GP: Gram Panchayat
ICT: Information and Communication Technology
IEC: Information, Education and Communication
ISWM: Integrated Solid Waste Management
MoEF&CC: Ministry of Environment and Forests & Climate Change
MoUD: Ministry of Urban Development
MRF: Material Recovery Facility
MSWMP: Municipal Solid Waste Management Plan
NAC: Notified Area Committee
NAPCC: National Action Plan on Climate Change
NGO: Non- Government Organization
NMSH: National Mission on Sustainable Habitat
NUSP: National Urban Sanitation Policy
O&M: Operation and Maintenance
PCC: Pollution Control Committee / Ladakh Pollution Control Committee
PPE: Personal Protection Equipment
PPP: Public Private Partnership
RCA: Recycled Concrete Aggregates
RCC: Reinforced Cement Concrete
RDF: Refuse Derived Fuel
RFID: Radio Frequency Identification
RWA: Resident Welfare Association
S.I.: Sanitary Inspector
S.O: Sanitary Officer
S.S.: Sanitary Supervisor
S.S.I: Sanitary Sub-Inspector
SC&T: Street Collection & Transportation
SHGs: Self Help Groups
SLB: Service Level Benchmark
SLF: Sanitary Landfill Facility
SOP: Standard Operating Procedure
SPCC: State Pollution Control Committee
SSS: State Sanitation Strategy

TPD: Tonnes per Day
ULB: Urban Local Body
WOW: Waste Out of Wealth
WTE: Waste to Energy

Definitions of commonly used terms	
Aerobic composting	A method of com-posting organic wastes using bacteria that need oxygen. This requires that the waste be exposed to air, either via turning or by forcing air through pipes that pass through the material.
Anaerobic digestion	A method of composting that does not require oxygen. This composting method produces methane. Also known as anaerobic composting.
Autoclaving	sterilization via a pressurized, high-temperature steam process.
Baghouse	A combustion plant emission control device that consists of an array of fabric filters through which flue gases pass in an incinerator flue. Particles are trapped and thus prevented from passing into the atmosphere.
Bio-degradable material	Any organic material that can be broken down by microorganisms into simpler, more stable compounds. Most organic wastes (e.g., food, paper) are biodegradable.
Bioremediation & Bio-mining	It refers to the excavation of old dumped waste and make windrow of legacy waste thereafter stabilization of the waste through bioremediation i.e., exposure of all the waste to air along with use of composting bio-cultures, i.e., screening of the stabilized waste to recover all valuable resources (like organic fines, bricks, stones, plastics, metals, clothes, rags etc.) followed by its sustainable management through recycling, co-processing, road making etc.
Bulk waste generators	As per Solid Waste Management Rules 2016, “Bulk Waste Generator” means and includes buildings occupied by the Central Government Departments or Undertakings, State Government Departments or Undertakings, Local Bodies, Public Sector Undertakings or Private Companies, Hospitals, Nursing Homes, Schools, Colleges, Universities, other Educational Institutions, Hostels, Hotels, Commercial Establishments, Markets, Places of Worship, Stadia and Sports Complexes etc having an average waste generation rate exceeding 100kg per day (of all waste streams put together).
Cleaner production	Processes designed to reduce the wastes generated by production.
Co-disposal	the disposal of different types of waste in one area of a landfill or dump. For instance, sewage sludges may be disposed of with regular solid wastes.
Collection	The process of picking up wastes from residences, businesses, or a collection point, loading them into a vehicle, and transporting them to a processing, transfer, or disposal site.
Combustibles	Burnable materials in the waste stream, including paper, plastics, wood, and food and garden wastes.
Combustion	In MSWM, the burning of materials in an incinerator.
Composting	Biological decomposition of solid organic materials by bacteria, fungi, and other organisms into a soil-like product.

Construction and demolition debris	Waste generated by construction and demolition of buildings, such as bricks, concrete, drywall, lumber, miscellaneous metal parts and sheets, packaging materials, etc.
Controlled dump	A planned landfill that incorporates to some extent some of the features of a sanitary landfill: siting with respect to hydrogeological suitability, grading, compaction in some cases, leachate control, partial gas management, regular (not usually daily) cover, access control, basic record-keeping, and controlled waste picking.
Disposal	The final handling of solid waste, following collection, processing, or incineration. Disposal most often means placement of wastes in a dump or a landfill.
Domestic Hazardous waste	Used diapers, napkins, condoms, mosquito repellents, chemical cleaning agents etc.
Energy recovery	The process of extracting useful energy from waste, typically from the heat produced by incineration or via methane gas from landfills.
Environmental impact assessment (EIA)	An evaluation designed to identify and predict the impact of an action or a project on the environment and human health and well-being. Can include risk assessment as a component, along with economic and land use assessment.
Environmental risk assessment (EnRA)	An evaluation of the interactions of agents, humans, and ecological resources. Comprised of human health risk assessment and ecological risk assessment, typically evaluating the probabilities and magnitudes of harm that could come from environmental contaminants.
Hazardous waste	Waste that is reactive, toxic, corrosive, or otherwise dangerous to living things and/or the environment. Many industrial by-products are hazardous.
Heavy metals	Metals of high atomic weight and density, such as mercury, lead, and cadmium, that are toxic to living organisms.
Incineration	The process of burning solid waste under controlled conditions to reduce its weight and volume, and often to produce energy.
Informal sector	The part of an economy that is characterized by private, usually small-scale, labour-intensive, largely unregulated, and unregistered manufacturing or provision of services.
Inorganic waste	Waste composed of material other than plant or animal matter, such as sand, dust, glass, and many synthetics.
Integrated solid waste management	Synchronized and coordinated use of a set of waste management collection, transportation, processing, and disposal methods, each of which can play a role in an overall MSWM plan.
Landfill gases	Gases arising from the decomposition of organic wastes; principally methane, carbon dioxide, and hydrogen sulphide. Such gases may cause explosions at landfills.
Landfilling	The final disposal of solid waste by placing it in a controlled fashion in a place intended to be permanent. The Source Book uses this term for both controlled dumps and sanitary landfills.
Materials	A facility for separating commingled recyclables by manual or

recovery facility (MRF)	mechanical means. Some MRFs are designed to separate recyclables from mixed MSW. MRFs then bale and market the recovered materials.
Open dump	An unplanned "landfill" that incorporates few if any of the characteristics of a controlled landfill. There is typically no leachate control, no access control, no cover, no management, and many waste pickers.
Organic waste	Waste containing carbon, including paper, plastics, wood, food wastes, and yard wastes. In practice in MSWM, the term is often used in a more restricted sense to mean material that is more directly derived from plant or animal sources, and which can generally be decomposed by microorganisms.
Pollution	The contamination of soil, water, or the atmosphere by the discharge of waste or other offensive materials.
Processing	Preparing MSW materials for subsequent use or management, using processes such as baling, magnetic separation, crushing, and shredding. The term is also sometimes used to mean separation of recyclables from mixed MSW.
Producer responsibility	In the context of MSWM, a system in which a producer of products or services takes responsibility for the waste that results from the products or services marketed, by reducing materials used in production, making repairable or recyclable goods, and/ or reducing packaging.
Public place	Public place includes any road, arch road, viaduct, lane, footway, alley or passage, highway, causeway, bridge, square alley, or passage whether a thoroughfare or not over which the public have a rite of passage, and such places to which the public has access such parks, garden, recreation grounds, playgrounds, beaches, water bodies, water courses, public plazas and promenades, government and municipal buildings, public hospitals, markets, slaughterhouses, courts, etc.
Pyrolysis	Chemical decomposition of a substance by heat in the absence of oxygen, resulting in various hydrocarbon gases and carbon-like residue
Recycling	The process of transforming materials into raw materials for manufacturing new products, which may or may not be similar to the original product.
Refuse-derived fuel (RDF)	Fuel produced from MSW that has undergone processing. Processing can include separation of recyclables and non-combustible materials, shredding, size reduction, and pelletizing.
Sanitation	Sanitation is defined by the Ministry of Housing & Urban Affairs (MoH&UA) in the National Urban Sanitation Policy (2008) as 'the safe management of human excreta, including its safe confinement, treatment, disposal, and associated hygiene-related practices'. The UT Administration of Ladakh adopts a wider definition of Sanitation as "the safe management of human excreta (urine and feces), solid waste generated in all areas within jurisdiction of the UT including industrial, airport authority and army cantonment areas. It

	includes the safe management at each stage – containment, collection, transport/ conveyance, treatment, disposal and reuse at each stage of the value chain.”
Sanitary landfill	An engineered method of disposing of solid waste on land, in a manner that meets most of the standard specifications, including sound siting, extensive site preparation, proper leachate and gas management and monitoring, compaction, daily and final cover, complete access control, and record-keeping.
Site remediation	Treatment of a contaminated site by removing contaminated solids or liquids or treating them on-site.
Source segregation	In the context of MSWM, setting aside of compostable and recyclable materials from the waste stream before they are collected with other MSW, to facilitate reuse, recycling, and composting.
Treatment	In the context of MSWM, means the method, technique or process designed to modify physical, chemical, or biological characteristics or composition of any waste so as to reduce its volume and potential to cause harm.
Waste hierarchy	The priority order in which the solid waste should be managed by giving emphasis to waste prevention, reduction, reuse, recycling, recovery, and disposal, with prevention being the most preferred option and disposal at the landfill being the least preferred.

Contents

1.1 Preface:

A waste crisis is clearly emerging in the Ladakh region, fuelled by rising quantities of waste and changing consumption patterns, increasing tourist footfall on the one hand, and incompatible regulation and management on the other. The waste-to-resource approach promotes a paradigm shift in the management of solid waste alongside the management of waste, which is an important pillar of our waste management approach. Thus, this policy document is not titled as a waste management policy, but as resource management policy.

Figure 1 Importance of SWM Strategy

The scientific Solid Waste Management (SWM) assumes importance with the increasing urban population, changing living styles and its importance in general life for good health. Considering its importance, Ministry of Environment and Forests and Climate Change (MoEF&CC) has notified the Solid Waste Management Rules, 2016 vide notification No. S.O.1357(E) dated 8th April 2016 in supersession of Municipal Solid Waste (management & handling) Rules, 2000. In conformity with Rule 11 (1) (a) of Solid Waste Management Rules, 2016, "**Union territory of Ladakh Solid Waste Management Policy"** is being notified to ensure scientific and systematic management of solid waste in the UT of Ladakh.

1.2 Legal & Regulatory Framework & Mandates

73rd and 74th Constitutional Amendment, 1992

Lay down the functions of GPs and ULBs, which have since been recognized as third tier of Government, for scientific and systematic solid waste management as per prescribed SWM Rules 2016.

Municipal SWM (Management and Handling) Rules in 2000 under the **Environment Protection Act of 1986**

Mandates all municipal authorities to implement improved systems of waste management as spelt out in the rules, not only class I cities.

Municipal Solid Wastes (Management and Handling) Rules 2016

Focuses on the principal of 3Rs (reduce, re-use and re-cycle), source segregation and appropriate processing/ management of biodegradable and non-biodegradable closest to point of generation to reduce the financial burden on the urban local bodies (ULBs) and natural resources and elimination of environmental degradation.

Solid Waste Management Rules, 2016

Rule 11 states that the Secretary, Urban Development Department in the State through the Commissioner or Director of Municipal Administration or Director of Local bodies will prepare a state policy and solid waste management strategy for the state in consultation with stakeholders including representative of civil society organizations working in the field waste management.

Rule 15 states that the local authorities and Panchayats of census towns and urban agglomerations will prepare a solid waste management plan as per state policy and strategy on solid waste management within six months form the date of state policy and submit a copy to respective departments of State Government or agency authorized by State Government.

The Rules also mandate the development of **a bye-law[1] on solid waste management in the region** by the Local Self Governing Authorities. The Local Authorities will decide user fee, incentives, conditions for licensing, fines, and other penal action for non-compliance of directives of the Solid Waste Management Rules or Bye-laws.

Some of the other regulations pertaining to city sanitation and waste management, applicable to local bodies are given in Point no. 8 of the Annexure.

Swachh Bharat Mission (Urban and Grameen)

To improve solid waste management, and Open Defecation Free (ODF) statuses in cities and rural areas. Swachha Survekshan, an annual survey exercise by MoHUA as part of SBM, is being conducted to enable cities to perform on Solid waste management indicators and rank them under various categories such as **Open Defecation Status and Garbage Free Cities (GFC).**

The Sustainable Development Goals (SDGs)

Building upon the United Nation's Millennium Development Goals (MDGs) 17 SDGs have been laid down and 169 targets to be achieved by the year 2030 including universal access to clean water and sanitation and to ensure universal access to safe and affordable drinking water by 2030 by investing in adequate infrastructure, provision of sanitation facilities and encourage hygiene at every level.

1.3 Scope of this Document

- The policy is limited to Solid Waste Management & Plastic Waste Management.
- Biomedical Waste, E-waste, Radioactive Waste etc. require advanced technical processing and protocols for its safe handling. As per the

[1] Sec.15(e) Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

provisions laid under E-Waste Management Rules 2016, the Ladakh Pollution Control Committee with the support of the concerned Departments of the Government of Ladakh will make a separate strategy and action plans and would eventually set up common processing cum recycling system for managing these waste streams. Suitable options of private sector participation would be examined for this.

- As per the population criteria, the management of C&D waste is not a mandate for the local bodies in Ladakh. However, looking at the recent growth in the construction and infrastructure activities, the UT has decided to address this with suitable interventions.
- The policy will be applicable and binding upon the all the urban local bodies (including census towns, notified areas), rural local bodies (including revenue villages and hamlets), development authorities, other UT and central government departments, establishments, line agencies, public offices etc.

1.4 Potential Users of this Document

This policy is aimed to provide guidelines and strategy for improvement of Solid waste management in the Union Territory of Ladakh. The main users include The Government departments of Union Territory of Ladakh, Urban Local Bodies, Gram Panchayats, LAHDC, Waste management contractors and agencies, Recyclers, and Bulk waste generators (institutional, commercial).

1.5 Vision

"Attaining Garbage-free Ladakh by means of energy efficient and carbon-neutral waste management and making Ladakh the cleanest region in the country."

1.6 Objectives

In order to realise the vision of the Government of Ladakh, the following objectives have been laid out. Each of the objectives highlights an aspect to be achieved in the SWM sector.

- To achieve "Zero waste" status by 2030 through sustainable interventions, innovations, and technology
- 100% segregation of residential and commercial waste at source along with processing of the segregated waste
- 100% door-to-door collection of solid waste from all properties including industrial units outside designated industrial estates
- Integrated Waste Management (Centralized and Decentralized) for Biodegradable and Non-Biodegradable waste leading to minimum disposal at Sanitary Landfill
- Management of C&D waste and recycling
- Elimination of any secondary waste collection points to achieve the vat-free city

- Achieving and sustaining high Swacchata and GFC ranking in national level
- SWM infrastructure compatible to extreme cold/dry climate

According to Census 2011, the total population of Leh district is 133487, out of which the urban population is 45671 and the rural population is 87816. Similarly, the total population of Kargil district is 140802, out of which the urban population is 16338 and the rural population is 124464.

2.1 Urban

There are currently 02 ULBs in the Union Territory of Ladakh, i.e., Municipal Council Leh & Municipal Council Kargil.

Table 1 Current Waste Management in MC Leh and Kargil [source: MC Leh and Kargil]

Sr #	Description	MC Leh	MC Kargil	Total Urban
1	Population	30870	16338	47208
2	Number of Business Establishment (2021)	586	1500	586
3	Total Number of Households	7360	2446	9806
4	Number of households covered by door-to-door collection	100%	100%	100%
5	Estimated Total Wet waste generated (Daily Avg. in MT)	4.358 TPD	1.961 TPD	-
6	Estimated Total Dry waste generated (Daily Avg. in MT)	6.358 TPD	2.941 TPD	-
7	Estimated Inert Waste	1.634 TPD	0.735 TPD	-
8	Estimated Plastic Waste generated (Monthly average in MT)	4.021 TPD	1.22 TPD	-
9	Municipal MSW Processing Plant	1	1 (Under Construction)	-
10	Number of Sanitary Landfill Sites (SLF)	1 (under construction)	1 (proposed)	-
11	Number of Material Recovery Facility (MRF)	–	–	-
12	Total number of Safai Karamcharis	115	85	-

Currently, the waste management in urban areas of Ladakh is primarily undertaken in two ways:

i. The waste is collected and sent to the landfills

ii. The waste is sent to a Material Recovery Facility (MRF), what's recyclable is sold to recyclers, what's not is sent to incinerators

The Safai karamcharis who provide door-to-door collection service use thermocol boxes as compartments and segregate household waste. Some bulk generators like hotels and guest houses have their own on-site facility to recover plastic waste, as well as segregate wet and dry waste. Currently, Leh and Kargil has 100% source segregation of waste. The primary waste generators in UT Ladakh include both bulk waste generators and domestic waste generators. The household waste is generally given without any segregation, thus becoming convoluted by the plastic along with the dry and wet waste generated. This mixed waste is then sent to MRFs, then the unrecyclable or non-salvageable material is sent to landfills or incinerators which further causes harm. The bulk waste generators, as per Solid Waste Management Rules, 2016, like hotels, commercial markets, schools, colleges, universities, other educational institutions, government buildings, etc. may have average waste generation capacity of more than 100 kg per day. The hospital waste is not to be mixed with municipal solid waste and shall be treated as per Bio-medical Waste Management Rules, 2016. Since plastic currently lacks various economical and available alternatives, it stays in circulation and causes further deterioration in the habitat, as well as in the nature. Limited institutional, infrastructure and operational capacity are the biggest challenges in mitigating plastic waste in the UT.

2.2 Rural

Leh:

The Leh district administration in collaboration with the local Rural Development Department and support from the Leh Autonomous Hill Development Council (LAHDC), started 'Project Tsangda,' an initiative towards sustainable waste management in rural and semi-rural areas of the district, on December 13, 2017. Since inception, substantial amount of waste has been sold to scrap dealers and reused in making plenty of recyclable products like biofuel bricks from the discarded cardboards, egg trays and other agriculture wastes. Similarly, paper and cloth waste were used for making decorative items, curtains, toys, cushion covers, etc. Wine/beer bottles and other broken glasses were also reused in construction of roads and buildings by agencies like Public Works Department, General Reserve Engineer Force (GREF) of the Border Roads Organisation (BRO) and other construction companies thereby, generating a good amount of revenue for the department to run the project, besides playing a big role in health and environmental upgradation with reduction in air and water pollution.

Table 2 Current Waste Management in Rural Areas in Leh and Kargil

Sr. #	Description	Leh (Rural)	Kargil (Rural)
1	Current Population (estimated 2021)	92709	127382
2	Waste Generation 2021	14 TPD	14.59 MTD
3	Household Level Coverage SWM	13%	4.05%
4	Segregation of Waste at Source	80%	80%
5	Extent of door-to-door collection	20%	4.05%

6	Compost plant for biodegradable waste	No	No
7	Material Recovery Facility for non-biodegradable waste	No	No
8	Scientific disposal of inert at SLF	No	No
9	Efficiency in redressal of customer complaints	30%	30%
10	Efficiency in collection of SWM related user charges	30%	30%
11	Extend of cost recovery in SWM Services	30%	Nil

Source: Office of the Assistant Commissioner of Development (Rural)

Kargil:

Solid liquid waste management in Rural areas of district Kargil is being taken up under CSS SBM (G) and State Development Package 2020-21. The funds under SDP 2020-21 are yet to be utilized for construction of segregation sheds at block TSG, Zanskar, Shargole, Drass and Sankoo (waste resource centers), which could not be taken up due to due Covid pandemic situation. Rural Development Department, Kargil has recently submitted Annual Implementation Plan (AIP) for the year 2021-22 and Project Implementation Plan (PIP) for the period 2021-22 to 2025-26, which covers Solid and Liquid Waste Management (SLWM) in the entire rural areas of district Kargil. Total solid waste generated in Kargil rural is 40.99 MT per day.

2.3 Gaps & Challenges

To summarise, the current SWM system in the UT of Ladakh has the following challenges to be addressed:

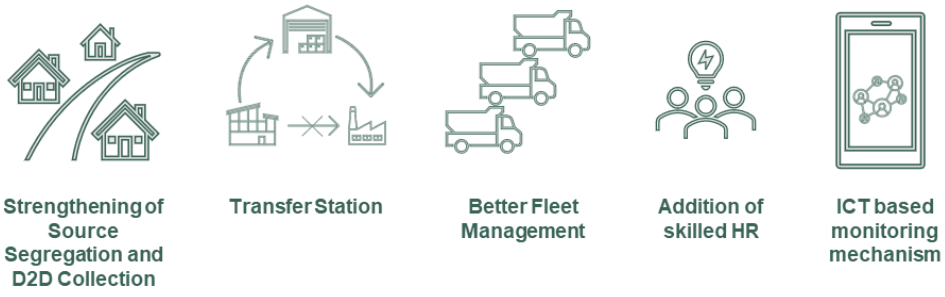

Figure 2 Initial Strategizing for gap management

- 100% segregation of residential and commercial waste at source is to be optimized.
- The D2D collection of waste across the UT is to be optimized with greater efficiency and prevent collection leakages in the process.
- Limited capacity for scientific waste treatment and/or processing.
- Lack of provision for in-situ and decentralized processing of biodegradable waste at neighbourhood/ward/zone level.

- Availability of skilled human resource for waste management, especially during the long winters.
- High seasonal variation of waste generation, low calorific value of waste, extreme low temperatures together pose challenge toward selection of appropriate technology solution.
- High tourist footfall and floating population during March to November creates additional burden on the waste management system.
- Lack of legal and regulatory framework to enforce penal measures for the offenders.
- Limited institutional capacity at the cutting-edge level at the local bodies.

Chapter 3: Principles & Strategies

3.1 Principles

The guiding principles for Solid Waste Management in Ladakh is as follows:

i 6-Rs for Total Waste Management

Figure 3 SWM Approach

- **RETHINK** –Use of products such as thermocol, plastic wraps, and other single use plastics, or things with limited lifespans, as well as local processing of other non-biodegradables.
- **REDUCE** – Promoting wise and rational use of materials to consume less, resulting in less waste generation and exploring multi-purpose products, and bulk purchases wherever possible. e.g., buying larger sizes of toiletries, washing detergent, non-perishable food (pasta, rice, lentils), etc.
- **REUSE** - To identify components/products that can be reused, refurbished, repaired, or re-implemented as spares, thus reducing waste, and increasing revenues from what was previously considered waste. CSOs or aggregators may be empanelled who will collect such items and give them a new lease of life.
- **RECYCLE** - To discover if and how waste can be turned into new substances or products by citizens and administration alike.

- **RECOVER** - To optimize the value chain of waste; suitable material recovery and processing facilities are to be set up to convert biofertilizer, extraction of energy from compostable waste to produce biofuels, electricity, and other useful products.
- **RESEARCH –** The UT will work with producers, incubators, and research institutions to incorporate best national/global practices and would promote innovation for locally suitable processing technologies, development substitute materials to plastic etc.

The primary focus of Solid Waste Management will be on waste reduction[2]. Green protocol will be made mandatory across all sectors to eliminate single use plastic products and to bring down use of low value small format plastics. The Government will promote alternate products and services that can replace wasteful, ecologically unviable, and unsustainable products.

ii Segregation at Source

100% source segregation at source, segregated collection and transportation of solid waste will be mandatory for solid waste management plans of Local Authorities. Segregation will mean sorting and separate storage of various components of solid waste namely biodegradable wastes including agriculture and dairy waste, non-biodegradable wastes including recyclable waste, non-recyclable combustible waste, sanitary waste and non-recyclable inert waste, domestic hazardous wastes, and construction and demolition wastes [3(44) SWM Rules, 2016].

iii Resource Recovery

The Solid Waste Management systems will be oriented towards maximum recovery of resources from discards for recycling and reuse. Swap shops, Waste Exchange Programs, Material Recovery Facilities (MRFs)[3] and Resource Recovery Centres will be used to ensure maximum recovery of resources.

iv Co-disposal

The Solid Waste Management systems will be oriented towards optimizing the value recovery by adopting co-disposal. For instance, sewage sludges may be combined with the organic compost for enhancing their nutrient value that would fetch higher revenue for the local bodies.

v No Open Burning of Waste

Burning of solid waste is a destructive and polluting process; hence no solid waste will be allowed to get disposed through open or closed burning, incineration4, co- incineration5, or any other thermal processes. Burning of

[2] Sec.11(b), Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

[3] Sec.3(31) Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

[4] Incineration plant: any stationary or mobile technical unit and equipment dedicated to the thermal treatment of wastes with or without recovery of the combustion heat generated. This includes the incineration by oxidation of waste as well as other thermal treatment processes such as pyrolysis, gasification, or plasma processes in so far as the substances resulting from the treatment are subsequently incinerated. (Directive 2000/76/EC of the European Parliament – 4 December 2000)

biodegradable / recyclable materials will be strictly prohibited. Whereas, Rule 15(g) of Solid Waste Management Rules,2016 makes it incumbent upon local authorities and Panchayats to direct the waste generators not to litter i.e., throw scientifically dispose of any waste such as paper, water bottles, liquor bottles, soft drink canes, tetra packs, fruit peel, wrappers, etc. or burn or burry waste on streets, open public spaces, drains, water bodies and to segregate at source as prescribed under these rules and hand over the segregated waste to the authorized waste pickers or waste collectors authorized by the local body.

vi Mainstreaming Climate Change & Net-zero Aspiration of Ladakh

When organic waste decomposes, carbon dioxide and methane gas is created. Rubbish sent to a dumpsite or landfill represents a significant amount of such greenhouse gases' emissions to the atmosphere and have contributed to climate change. Open dumping of unsegregated waste pollutes the freshwater streams and burning releases major pollutants often linked to the glacier melt.

Climate change has accelerated the need to find measures to reduce and manage the waste we create. Reduction and reuse of waste will help reduce pressure on the planet's natural resources while potentially reducing emission of greenhouse gases created through mass production and burning of fossil fuels. Bio-mining and capping of the legacy landfill sites will be done to stop methane emission. Battery operated vehicles would be used for collection and transportation of waste. Renewable energy would be used in the processing and treatment plants.

As per Rule (F)(i) of Solid Waste Management Rules,2016, "Landfill gas control system including gas collection shall be installed at landfill site to minimize odour, prevent off-site migration of gases, to protect vegetation planted on the rehabilitated landfill surface. For enhancing landfill gas recovery, use of geo-membranes in cover systems along with gas collections wells should be considered.

vii Promotion of Home Composting

To create ownership among the community toward waste management and environment and health improvement, the UT will actively promote and incentivize home composting so that minimum waste comes to the system. Water efficient and all-climate urban farming and kitchen gardening would be promoted.

viii Extended Producers' Responsibility

"My Waste is My Responsibility" will be the underlying principle, where manufacturers/producers have to assume the responsibility of the waste generated in their premises. Industries, businesses, and other bulk waste generators will be responsible under Extended Producer Responsibility6 for source level segregation, storing and recovery of solid waste. The manufacturers, brand owners and distributors will be held responsible and

[5] Co-incineration plant: any stationary or mobile plant whose main purpose is the generation of energy or production of material products (Directive 2000/76/EC of the European Parliament – 4 December 2000)

[6] Sec.3(21) Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

liable of collection, sorting, transportation, storing and recovery of plastics[7], E-waste[8], Hazardous waste and absorbent hygiene products. The Government will enforce mechanisms based on the provisions of Plastic Waste Management Rules 2016, E-Waste Management Rules 2016, and Hazardous Waste Management Rules 2016. Rule 17(1) of Solid Waste Management Rules,2016 mandates manufacturers of disposable products such as tin, glass, plastics packaging, etc. or brand owners who introduce such products in the market shall provide necessary financial assistance to local authorities of waste management system. Similarly, Rule 17(2), 17(3) and 17(4) also outlines the clear roles, and responsibilities, and puts the onus of packaging, collection, disposal and education lies on the manufacturers, brand owners or marketing companies.

ix Integration of informal sectors

The informal sector – waste/rag pickers and scrap dealers – will be integrated[9] to the UT level Solid Waste management regime as primary partners. The informal sector will be represented[10] in UT Level Advisory Body which has already been constituted vide Order no. 35-LA(GAD) of 2022, dated 15.02.2022. The Government of Ladakh recognizes the role of informal sector which involves waste pickers and scrap dealers who are connected to the larger national network of recycling. Priority will be given to the informal sector when it comes to assign the right over discards / scrap materials. The waste pickers and scrap dealers will be identified and authorized to collect / receive, discards from public and government institutions for recycling. They will be integrated as partners of Solid Waste management network in the UT of Ladakh.

x Dignity of Labour

The services of people engaged in solid waste management will be recognized as environmental services and the people will be considered as skilled labour and / or technicians. The services of cleaning, waste collection, transportation, sorting, disassembly, processing, recycling will be considered as environmental services which ensures environmental and public health. The people engaged in these jobs will be technically trained and updated periodically to elevate the status of such jobs. The Government will ensure the dignity of labour by providing safe and hygienic working environment including adequate PPE, economic opportunity and social security for the people engaged in the environmental services. Campaigns will be directed towards marketing services related to waste.

Both MC Leh and Kargil have notified the establishment of 'Responsible Sanitation Authority'. The operational helpline service for sanitation emergencies in Leh is 400027 and for Kargil is 14420.

[7] Sec 9(1-5), Plastic Waste Management Rules 2016, Ministry of Environment, Forests and Climate Change, Govt. of India. 18th March 2016.

[8] Sec 3(t,u,v), Sec.5(1) a,b,d,g, Sec.5(2), Sec.5(3), Sec.5(6), Sec.5(7) E-Waste Management Rules 2016, Ministry of Environment, Forests and Climate Change, Govt. of India. 1st October 2016.

[9] Sec.11(c), Sec.15(h), Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

[10] Sec.11(c), Sec.15(h), Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

3.2 Strategies

The Strategies for solid waste management that would be adopted in Ladakh are as follows:

i Cluster-based Approach

Ladakh is a scantily populated state and considering the urban-rural continuum, a cluster-based approach for SWM will be adopted. Solving the problem of production and consumption waste is becoming one of the priority areas, since it simultaneously contains the following components: economic (disposal cost, saving natural resources), environmental (reducing releases of harmful substances into the environment) and social (new jobs, reducing the burden of diseases, fostering an attitude of care towards nature among the population). The creation and development of regional clusters of waste processing can be a key element in solving the problem.

The Shyama Prasad Mukherji Rurban Mission (SPMRM) or the Rurban Mission of the Ministry of Rural Development, Government of India aims at developing infrastructure and livelihood opportunities in cluster of Gram Panchayats that demonstrate economic growth potentials. This is being executed by converging schemes from the Central and various State government departments, coupled with a critical gap fund provided by the Rurban Mission. One of the components many of the ICAPs (Integrated Cluster Action Plans) have solid waste management in Rurban clusters.

The GPs in every Rurban cluster has a Cluster Development Management Unit (CDMUs), which is a representative body of all the GPs in the cluster. The same CDMU can sign an MoU amongst themselves, including the adjoining ULBs, detailing out the waste management arrangement in the cluster, unless the CDMU members decided otherwise such as a new body such as Cluster Waste Reduction & Management Committee (VWSC) may assume such role. The MoU thus prepared will clarify the powers and functions of every participating GP and ULB, the role of households, the role of sanitation workers, and other provisions that a waste management system may entail. This document [MoU] will be the reference point for obtaining clarification in case there is a dispute, misunderstanding or non-participation, non-cooperation, non-compliance to any aspect of the waste management chain / system.

ii Micro Planning

A Micro Plan is a process of creating a solid waste management plan for the smallest unit of management, by splitting the Ward into operational Blocks/Bits. This helps in achieving the service level benchmark by optimizing the operational effectiveness of system, rationalization of human resources and cost.

The process includes:

- Route rationalization for movement of collection and transportation vehicles.
- Identification of willing block residents (two per block) to volunteer as SafaiMitra, to create door-to-door awareness and improve the quality of segregation at source.

- Allotment of one Auto-Tipper for the block with the details of the Vehicle and driver given to the block residents.
- Planning and scheduling periodic drain and sewer cleaning.
- Geo-fencing the block and tracking the Auto-tipper to ensure reliable and timely collection.
- Scheduling Block-wise pick up of wet and dry waste collection from all bulk and non-bulk sources.
- Scheduling street sweeping.
- Empowering the SafaiMitra to monitor the collection through phone apps and report non-compliance in their block. Following measures are proposed for improving the dignity and working conditions of the Safai Mitra Karamcharis:

    - **Complete prohibition of manual scavenging** - Upholding the ban and vigilant monitoring of the provisions mentioned under 'The Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013.' The local bodies to ensure that no person needs to enter a sewer or septic tank, unless absolutely unavoidable in the interest of greater public hygiene. The initiative, that promotes mechanized cleaning, also aims to ensure that no life of any sewer or septic tank cleaner is ever lost again owing to the issue of 'hazardous' cleaning.
    - **Dignity of labour** - It is necessary to protect sanitation workers and prevent them from being stigmatized in society. A variety of measures are to be ensured by the local bodies to mitigate the occupational risk, including provision of personal protective equipment and hygiene facilities, organizing training, media campaigns, emergency medical insurance coverage, life insurance coverage, regular health check-ups, preventive immunization, and medical care.
    - **Soft Loans linkages** - Loans are to be provided to the Safai Karamcharis for and their dependents, through National Safai Karmacharis Finance & Development Corporation (NSKFDC), to enable them to take up alternative income generating activities, which will help in their socio-economic upliftment.
    - **Helpline number** - A dedicated helpline number to be provided for the Safai Mitras to register their complaints and to receive real-time solutions.
    - **Prevention of substance abuse** - To tackle the issue of Substance Abuse (that often lead to indebtedness) among the frontline sanitation workers, the UT administration and the local bodies may implement programme in collaboration with the Nasha Mukt Bharat Abhiyaan (NMBA). Local body/District Level Nasha Mukt Committees may be set up to take lead in the implementation of the Abhiyaan in their respective local body/districts.

iii Decentralized Solid Waste Management & Disposal

Ladakh has a tough and undulating terrain. Since the availability of land for solid waste management is less, the effort, cost and infrastructure required to transport waste generated from households to a common / centralised facility will reduce efficiency of the system. Decentralized mode of waste management has also been suggested for hilly regions like Ladakh by the

SWM Rules 2016[11]. Three tier system mentioned below will be followed for putting a resource-efficient waste management system in place.

Three tier system:

For Ladakh, the following three tiers decentralized, and cascading management system is being conceived:

(a) *Source level Systems* –Initially there would be separate collection system for the dry and wet wastes. With higher efficiency at source segregation, home and community composting of biodegradable waste will be promoted clubbing it with a urban agriculture movement. Mini organic waste composters may be installed in market areas and other densely populated neighbourhoods to promote localized community composting. D2D collection of non-biodegradable and domestic hazardous waste would have fixed weekly schedule for each of the municipal wards.

(b) *Cluster / Community Level Systems* – Material Recovery Facilities, at ULB level, be established to manage segregated biodegradable discards collected from clusters of households / institutions / commercial establishments and public places. Also, this facility will act as a collection cum storage centre segregated for non-biodegradable discards. This facility is also meant for receiving processed compost and / or compost rejects from those who do source level composting. Additionally, there would be a wet waste composting facility to process any additional wet waste, horticulture waste that is not treated at the household/community level. Provision of incinerators would also be kept for processing of domestic hazardous waste. In a Material Recovery Facility non-compostable solid waste can be temporarily by the local body or any other entity mentioned in Rule 2 to facilitate segregation, sorting and recovery of recyclables from various components of waste.

(c) *Common Facility* – At district/sub-district level, Regional Resource Recovery Centres (RRRCs) may be established as Common Facility. The functions of RRRCs are as follows:

- Receive segregated non-bio-degradable discards from bulk waste generators and rural/peri-urban areas which cannot be handled at ULB level MRFs.
- Receive segregated bio-degradable discards from the bulk waste generators and rural/peri-urban areas which cannot be handled at ULB level compost plants
- Receive segregated domestic and other hazardous discards from the bulk waste generators and rural/peri-urban areas
- Receive segregated domestic and other C&D discards from the bulk waste generators and urban/rural/peri-urban areas
- Common Facility will not receive any type of waste from public directly.

[11] Sec. 20(f) Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

iv Sector-wise Targeted Intervention

Collection, transportation, processing requirements of waste varies with sector. Hence, sector wise planning and intervention is suggested for efficient waste management in the UT. The sources of waste will be divided into the following sector, and solid waste from each sector will be collected and managed separately.

- Household sector
- Gated communities/Government Quarters/Army camps/Residential Campuses of Educational Institutions or other institutions
- Markets and commercial establishments
- Public Places / Roads / Picnic spot / Tourist spots
- Restaurants and Hotels
- Street vendors / hawkers
- Places of worship

v Ban on Single-use Plastic

The PWM Rule 2016, emphasized the ban of manufacturing and selling of <50 microns thickness plastic carry bags, and the UT, Ladakh is already in process of banning the use of plastic carry bags. Additionally, PWM rules have ensured that open burning of waste, plastic littering in public, and dumping near and into drains and rivers should be strictly prohibited. Compostable carry bags are being promoted. The plastic waste will be utilized in making roads, embankments and as a fuel in the cement industries. UT, Ladakh is committed to phase out use of single-use plastic by 2022. As per the Rule (1) of Plastic Waste Management (Amendment) Rules, 2016, “carry bag made of virgin or recycled plastic, shall not be less than seventy microns with effect from 30th September,2021 and one hundred and twenty (120) microns in thickness with effect from 31st December 2022.

vi Incentives / Disincentives

Incentives will be provided to those individuals, households & institutions that adopt Zero Waste systems and methods to reduce waste at source. The incentives will be in the form of:

- Subsidies / waiver in property tax / users fee for households to establish composting systems / kitchen gardening
- Subsidies / waiver in property tax / users fee for gated communities / flats to establish composting systems / MRFs / kitchen gardening
- Viability Gap Fund for participating scrap dealers which will be availed from the Government
- Social security for waste pickers / waste traders
- Viability Gap Fund for alternate products / services
- Awards / public recognition for Green practices in each sector

vii Private Sector Participation

UT will invite private sector to make investments and take up certain responsibilities of service delivery, while the local governments retain the

principal responsibility for these services. PPP mechanisms aim at financing, designing, implementing, and operating facilities and services through service provisions for feasible projects.

viii Appropriate Technology

The infrastructure should be compatible to waste volume and character, modular, robust, compatible and adaptive. Temperature plays a primary role in anaerobic digestion, since it shapes microbial ecosystems, and consequently regulates the stability performance of anaerobic digestion process. Microorganisms that thrive in extreme temperatures can be explored for Ladakh region if there is no option for operating in temperature controlled room.

SWM is more complex and challenging in dry highlands than in plain areas due to the remoteness, topographical configuration, and vulnerability to natural hazards and disasters. Based on the geographical, climatic conditions and volume and characteristics of waste it is found that thermal (burning) processing of waste may not be feasible in Ladakh. Conventional processes like composting, vermicomposting, and anaerobic digestion to treat biodegradable wastes are often found to be inefficient due to the regions' extreme cold conditions. Hi-tech anaerobic digestion is suggested as technologies to manage biodegradable discards.

ix Promotion of Sustainable Public Procurement

Green supply chain management (GSCM) has become a multidisciplinary concept by constructing environmental management practices in the context of various supply chains including waste management services. Environmental issues have become an important integration into the supply chain management, so that each step from organization’s materials management and transportation functions to the end customer can be structured to include environmental awareness. Adoption of sustainable public procurement policy for products and plastic packaging material made of recycled plastics, and alternatives to identified single use plastics, as per applicable standards should also be mentioned, as this is an actionable point covered in Comprehensive Action Plan submitted to MoEFCC. In a place like Ladakh, sustainable public procurement (SPP) will drive improved performance and would facilitate the achievement of cost-effective and responsible procurement, thereby generating greater business value. Collectively, this will boost regional socio-economic growth which will be in harmony with the environment and ecological systems.

Potential benefits of undertaking SPP are enlisted as under:

- reduction of quantum of waste in the municipal SWM system
- mitigating the harmful effects of pollution and waste generation
- reducing the impact of toxic substances on the environment and society improving long-term economic performance
- enabling more responsible utilization of natural resources
- promoting technological and process-based innovation
- providing strong signals to the sustainable products market and national/global investments
- advertising UT’s commitment towards contributing to the global/national targets for sustainability and carbon neutrality

x Focus on Tourism & Hospitality Industry

Ladakh aspires to move from sustainable eco-tourism to regenerative tourism. Growing tourist footfall in eco-sensitive Ladakh poses a significant environmental challenge as it substantially increases solid wastes in the region. Under the new SWM Rules, 2016, the hospitality industry, all hotels, and restaurants are required to segregate biodegradable waste and set up their own system of waste collection to ensure that food waste is utilised for composting / bio-methanation. The rules also mandate that all resident welfare and market associations and gated communities with an area of above 5,000 square metre will have to segregate waste at source into material like plastic, tin, glass, paper and others and hand over recyclable material either to authorised waste-pickers and recyclers or to the urban local body. Realizing the importance of Bulk Waste Generators in management of solid waste, the Government of India has revamped the Municipal Solid Waste (Management and Handling) Rules 2000 and notified the Solid Waste Management Rules, 2016 on April 8, 2016. The Rules mandate for effective solid waste management by bulk waste generators also. Further, they lay emphasis on the duties and responsibilities of waste generators including bulk waste generators with timeframe for implementation and monitoring by the Government/ ULB. These provisions would be enforced under the policy and with issuance of public notification from time-to-time. The local bodies will charge tourists at entry points to sustain SWM service at tourist destinations. The tourists will also be given strict direction not to dispose off any kind of waste (water bottles, liquor bottles, tetra packs, soft drink cans, and any other form of plastic or paper waste) on the streets or downhill, and instead deposit waste in litter bins placed by the local bodies. Introduction of 'green cess' and 'payments for environmental services,' including charging from tourists for the service provided and entrance fees may also be considered. The Local Bodies, together with the police, must supervise the tourism departments and different associated sectors to genuinely implement these critical agendas in IHR for the environment, tourism, and sustainable development. ‘Pay-as-you-throw’ (PAYT) scheme, follows the polluter to pay principle, may be implemented that would charge the tourists caught, littering, on the spots.

xi Convergence and Financing

Financing sanitation improvements in Ladakh have been largely funded through central government funding. Though higher levels of government continue to provide a significant portion of funds for the required capital investments, funding the operation and maintenance of sanitation infrastructure mostly falls under the purview of the ULBs and GPs. All funds from various central schemes and UT schemes / programs / missions and CSR contributions may be pooled to form a state sanitation fund. The aggregation of investment anticipated under the ULB / GP City Sanitation Plans would indicate financing requirements for implementing total sanitation in the UT. Under the overarching governing principle of cluster-based approach, a well-coordinated convergence of available funding under SBM 2.0 (Urban and Grameen), RURBAN would help achieving optimum return on the investments. A taskforce to enforce

surveillance and interception of waste in the garbage vulnerable tourist destinations and popular camping sites and shall be formed with Deputy Commissioner's Office and Ladakh Pollution Control Committee, Ladakh Police Department, Tourism Department, Rural Development Department and Housing & Urban Development Department. The environment fees being collected by the LAHDC shall also be utilized for creation of infrastructure and services for surveillance, solid and liquid waste management so that tourists have pleasant experience. Costing urban sanitation improvements will include the life-cycle costs of any infrastructure or system and due consideration of sharing of financial responsibility among the stakeholders, including the citizens, will be worked out. A detailed strategy for individual materials and action points is given in Point – 10 in Annexure.

Chapter 4: Process & facilities for Waste Management

With the rise of need for waste management in Ladakh, specific coherence of technology and processes is crucial. A holistic overview of the proposed system is presented in the following infographic.

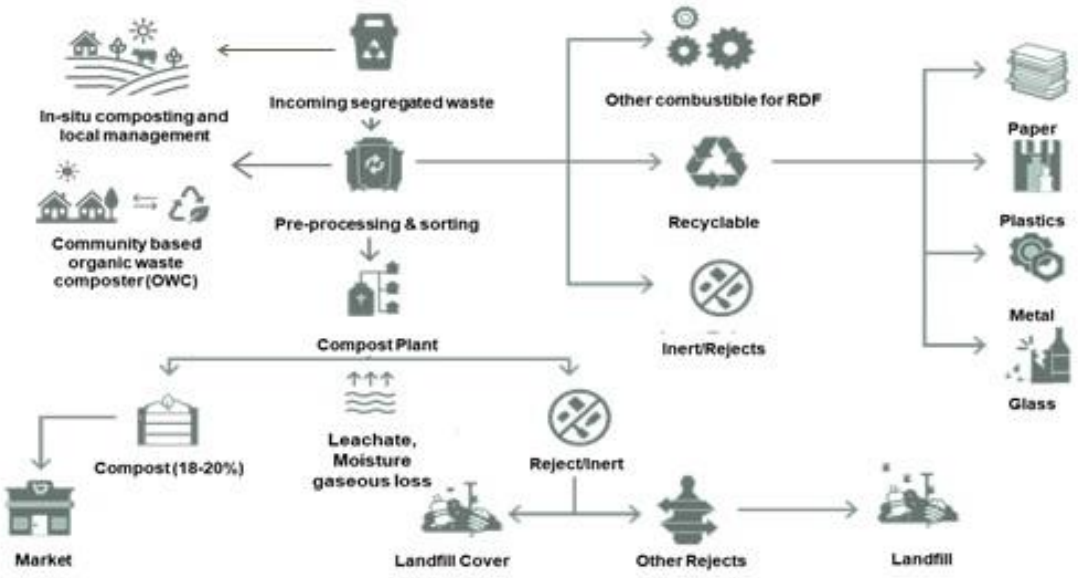

Figure 4 The conceptual process flow for integrated solid waste management in Ladakh with hybrid system of centralized and decentralized options

i Proposed process flow

a) Biodegradable discards

Segregation of waste at source provides choices for safe handling and /or recovery of waste. The biodegradable waste will be managed at source, household and community level, using aerobic composting or anaerobic digestion. The resulting compost will be further used for urban gardening / kitchen gardening. The composting reject or excess compost or semi-

processed slurry from anaerobic digesters will be brought to cluster level aerobic composting units for further processing.

For people those who cannot afford to have source level management systems can handover the biodegradable discards directly to the ULB/cluster level aerobic composting facilities. The service providers and / or Safai Karmacharis who pick up such segregated biodegradable discards from households, commercial establishments, markets, public places, or institutions may send them as animal feed for poultry / piggery farms or may send them for trenching in plantations. The compost generated at the cluster facilities will be made available to the farms after value addition and standardization of quality. The compost rejects/slow decaying material/inert wastes will be sent to the SLF. The proposed infrastructure for biodegradable is recommended in Point no. 7 (a) for Annexure for each sector.

b) Non-Biodegradable discards

Non-biodegradable discards will be managed only offsite at ULB or Cluster level facilities. Households, commercial establishments, and institutions will have choices to sell valuable non-biodegradable discards to scrap traders or donate it to waste pickers. Besides D2D collection by the local bodies, citizens may also drop segregated low value non-biodegradable discards at the nearest MRFs. Households, commercial establishments, and institutions will engage authorized service providers / Safai Karmacharis / waste pickers / waste traders to haul their non-biodegradable discards on payment basis. Authorized service providers / Safai Karmacharis / waste pickers / waste traders may skim the valuable discards and will drop the low value discards to the MRFs. Scrap dealers in the region will also utilize the MRFs or RRCs to hand over residuals for final disposal in landfill.

For managing non-biodegradable discards there are processing technologies available. However, these may not be techno-economically viable. Hence minimum sorting, cleaning, and storing of non-biodegradable discards are recommended. Proposed infrastructures for management of Biodegradable discards are given in Point no. 7 (b) of Annexure.

c) Domestic Hazardous and Bio-medical Waste

Glass, sharp metals, syringes, blades, batteries, medicines, paints, and other household level chemicals forms the hazardous waste. Waste containing body fluids, such as used diapers, condoms, cottons soaked with blood, sputum etc, form bio-medical waste. The above-mentioned categories of domestic hazardous wastes need to be stored safely till it is being disposed off through any authorized service providers, in line with Hazardous and other wastes (Management and Transboundary Movement) Rules, 2016. A closed space with a minimum of 300 sq. ft floor area is required for this. As per the provisions laid under Hazardous Waste Management Rules 2016, the Local Authority with the support of the Ladakh Pollution Control Committee, Government of Ladakh will set up appropriate mechanism and action plan for collection, transportation and processing of these categories of wastes. Bio-medical Waste should be managed and treated as per Bio-medical Waste Management Rules,

2016. The old and used batteries should be managed as per Battery Waste Management Rules,2022.

ii Provision of Land for future SWM infrastructure

For efficient SWM, availability of adequate and appropriate land is critical. All the Local Bodies, with help from the concerned district administration, will designate suitable lands and /or keep suitable provisions in their respective development plan / local area plan for future sanitation infrastructure facilities under Development Plan / Master Plan / Zonal Plan / Town Planning Schemes etc. Identification of land for common / cluster level infrastructure should also be made jointly by the appropriate agencies.

5.1 Legal & Regulatory Framework

i Local Body Bye-Laws

Under the overarching principles and strategies outlined in this policy; the Local Self Governments (ULBs & GPs) will frame Solid Waste Management Bye-Laws for effective and time-bound management of solid waste in the region. H&UDD and R&PRD will facilitate to develop template Bye-Laws that can be adapted by the Local Authorities with modifications to suit their local demand.

The Bye-Laws will incorporate necessary provisions from Solid Waste Management Rules 2016, Plastic Waste Management Rules 2016, Construction and Demolition Waste Management Rules 2016, E-Waste Management Rules 2016, Hazardous Waste Management Rules 2016. The Bye-laws would also address the relevant guidelines of CPHEEO, CPCB and PCC and bring in regulations and bans on specific materials, products, or processes, as well as incorporate incentives and disincentives for effective implementation of solid waste management rules and shall be facilitated by gazette notification of bye-laws once adopted by local bodies.

ii Notifications & Orders

Subsequent to the bye-laws, the district administration and / or the local authorities would issue specific notifications/orders:

- to curb and prohibit use of single-use plastic and thermocol
- to curb and prohibit open littering
- to ban burning of waste in open and public places
- to make in-situ waste management compulsory for the bulk generators
- to regulate in-situ waste management in the market areas, slaughterhouses, community places, religious places
- to regulate waste management during the tourist seasons

Some of these notifications have already been issued.

5.2 Institutional Framework

i Institutional Framework at the UT level

The proposed linear chain of command for implementation of towards a Zero-waste system will have the below mentioned institutional arrangement for accountability, decision making, guidance, implementation, and monitoring:

- **State Level Advisory Body**

  A Committee chaired by the Secretary, H&UDD, as envisaged in SWM Rule 2016, has already been formed with members for periodical evaluation and running the state level campaign for Zero Waste approach to Solid Waste Management. The committee shall comprise of the following members:

  <u>From the Administration of UT of Ladakh</u>

  - Administrative Secretary Housing & Urban Development Department
  - Administrative Secretary Rural Development Department

- Member Secretary, Ladakh Pollution Control Committee
- Director H&UDD Ladakh
- Director Horticulture/Agriculture Ladakh
- Representative of Revenue Department
- Representative of Labour Department
- Three representatives from Local Bodies to be nominated by the Housing & Urban Development Department by rotation in each meeting of the Body (By rotation from the list of ward members of both districts arranged alphabetically)
- Executive Officer, Municipal Committee, Leh & Kargil

From the Government of India:

- Representative from Ministry of Environment, Forest and Climate Change, Government of India
- Representative from Ministry of Housing and Urban Affairs, Government of India
- Representative from Ministry of Rural Development, Government of India

Experts/Non-official members:

- Representative from National Institute of Technology, Srinagar
- Sh. Stanzin Chonjor (Dawa), (Representative from LEDeG)

ii Institutional Framework for the Urban Areas

- **Secretary (UD&HD)** will assume the responsibility of implementation of State Policy on SWM and monitoring of the same in all Urban Local Bodies. Secretary may delegate coordination, implementation, and monitoring of the state policy to any of his team members in the rank of Mission Director / Under Secretary / Deputy Secretary.

- **Ladakh Pollution Control Committee** will have the responsibility of monitoring the compliances and effectiveness in the entire waste management cycle, and enforcement regulations as per Rule 16 (a) of SWM Rules 2016 through local bodies in their respective jurisdictions, while reviewing implementation of the rules at least twice a year in close coordination with concerned Directorate of Municipal Administration or Secretary-in-charge of Urban Development in the UT. PCC will also be responsible for seeking periodic report and necessary coordination with the CPHEEO/CPCB for guidelines and necessary advisories.

- **Divisional Commissioner** will assume the responsibility to periodically review the progress of SWM implementation in the UT.

- **Director of Urban Local Bodies** will assume the responsibility to periodically review the plans and progress of SWM implementation in the Municipal Committee/urban areas and for providing guidance and instructions for necessary corrective actions.

- **District Magistrate** will assume the responsibility to periodically review the plans and progress of SWM implementation in the respective districts and for providing guidance and instructions for necessary corrective actions. S/he will also be responsible for allocation of suitable lands for setting up of SWM infrastructures.

- **Local Authority Level Monitoring Committee -** A Committee chaired by head of Urban Local Body assisted by Municipal Executive Officer. The committee will have all elected representatives, representatives from clusters / ward level committees, invited experts and NGO representatives.
  Indicative Members: (a) Elected representatives (b) Representatives from Ward/Cluster level committees (c) Representatives from Educational institutions (preferably teaching staff) (d) Representatives from youth clubs (e) Experts working on Public Health, Sanitation and Waste Management (f) Environmental activists & Educational activists (g) NGO & Civil Society Organisation representatives (h) Representatives from Business community (Shopkeepers, Hoteliers, Traders, Workshop owners etc.) (i) Representatives from house owners and residents.

- **Municipal Executive Officer** will be responsible for the effective solid waste management programmes and process at the Urban Local Body level. Municipal Executive Officer may take technical support and guidance from Technical Support Group and /or City Level Monitoring team. Municipal Executive Officer may engage NGOs, student community, and other people to launch campaigns to set the background for the comprehensive SWM programme for the City.

- **Sanitation Inspector** will have the responsibility of SWM of a ward or a division. S/he will not be limited to monitor the health & sanitation of the market and residential areas but will also be responsible for the general upkeep & safety of the natural environment of the ULB. S/he will be empowered to integrate, monitor, and regulate activities that would detriment the natural environment of the ULB.

- **Sanitation Supervisors** will be carrying out his responsibilities regarding the upkeep & safety of the natural environment of the ULB.

- **Safai Karmacharis (Sanitation Workers)** need to be trained in segregation and collection of waste, basics of composting, organic urban gardening, data collection for vector index etc. Besides the cleaning up job, they need to be elevated as local trainers for people who are working in housekeeping sector of major commercial establishments. This will ensure uniform standard operating procedure in segregation, collection, and transportation of materials.

iii Institutional Framework for the Rural Areas

- **Secretary (R&PRD)** will assume the responsibility of implementation of State Policy on SWM and monitoring of the same in the rural areas. Secretary may delegate coordination, implementation, and monitoring of the state policy to any of his team members in the rank of Mission Director / Under Secretary / Deputy Secretary.

- **Divisional Commissioner** will assume the responsibility to periodically review the progress of SWM implementation in the UT.

- **Ladakh Pollution Control Committee** will have the responsibility of monitoring the compliances and effectiveness in the entire waste management cycle. PCC will also be responsible for seeking periodic report and necessary coordination with the CPHEEO/CPCB for guidelines and necessary advisories for both urban and rural areas.

- **Director of Rural Development Department** will assume the responsibility to periodically review the plans and progress of SWM implementation in the rural areas and for providing guidance and instructions for necessary corrective actions, and submit periodic reports as required to the nodal agency.

- **District Magistrate** will assume the responsibility to periodically review the plans and progress of SWM implementation in the respective districts and for providing guidance and instructions for necessary corrective actions. S/he will also be responsible for allocation of suitable lands for setting up of SWM infrastructures.

- **Local Authority Level Monitoring Committee -** A Committee chaired by head of Gram Panchayat assisted by Rural Development Officer. The committee will have all elected representatives, representatives from clusters / ward level committees, invited experts and NGO representatives.

  Indicative Members:
  (a) Elected representatives (b) Representatives from Ward/Cluster level committees (c) Representatives from Educational institutions (preferably teaching staff) (d) Representatives from youth clubs (e) Experts working on Public Health, Sanitation and Waste Management (f) Environmental activists & Educational activists (g) NGO & Civil Society Organisation representatives (h) Representatives from Business community (Shopkeepers, Hoteliers, Traders, Workshop owners etc.) (i) Representatives from house owners and residents.

- **Assistant Commissioner (Development)** will be responsible for the effective solid waste management programmes and process at the Gram Panchayat level. ACD may take technical support and guidance from Technical Support Group and /or GP Level Monitoring team. ACD may engage NGOs, student community, and other people to launch

campaigns to set the background for the comprehensive SWM programme for the GP.

- **Panchayat Secretary** will be responsible for the effective solid waste management programmes and process at the GP level. PS may take technical support and guidance from Technical Support Group and /or GP Level Monitoring team. PS Officer may engage NGOs, student community, and other people to launch campaigns to set the background for the comprehensive SWM programme for the GP.

- **Sanitation Inspector** will have the responsibility of SWM of a ward or a division. S/he will not be limited to monitor the health & sanitation of the market and residential areas but will also be responsible for the general upkeep & safety of the natural environment of the GP. S/he will be empowered to integrate, monitor, and regulate activities that would detriment the natural environment of the GP.

- **Sanitation Supervisors** will be carrying out their responsibilities regarding the upkeep & safety of the natural environment of the GP.

- **Safai Karmacharis (Sanitation Workers)** need to be trained in segregation and collection of waste, basics of composting, organic urban gardening, data collection for vector index etc. Besides the cleaning up job, they need to be elevated as local trainers for people who are working in housekeeping sector of major commercial establishments. This will ensure uniform standard operating procedure in segregation, collection, and transportation of materials.

5.3 Training & Capacity Building

The approach to capacity building in SWM should be not only about technology and economics but also about strengthening the administration systems for waste management and related activities (multidisciplinary and cross-sectoral). Addressing the need for human resource development and skill development to achieve better results in SWM. Focus on building sound institutions and good governance for attaining improved SWM. Delineating strategies for sustenance of achievements.

A comprehensive orientation, training and exposure visit plan for all level of functionaries to be rolled out at both the local level and the UT level. Specialized agency may be engaged to plan and manage the capacity building activities.

5.4 IEC/BCC

“Cleanliness cannot be achieved through Budget allocation. Behavioural change is the solution. It should become a mass movement,” PM Narendra Modi had said in a speech in 2016.

The goal of Zero Waste Ladakh can be achieved only when the public internalize the zero waste principles and bring in qualitative change in behaviour. This requires an in-depth understanding of the local culture, norms, demography, and the level of interest of people’s participation. However, while planning the course of action, the projects must intuitively

bridge the gap between the planning of behaviour change communication (BCC) interventions and how they are actually implemented. For a BCC approach to be effective, they also need to be carefully designed and creative to keep the participants engaged.

A comprehensive IEC / BCC programme would be designed in consultation with the local administration and other stakeholders and would be rolled out across the UT. Specialized agency may be engaged to design innovative, multi-modal communication campaign and its implementation.

5.5 Activating Stakeholders' Participation

The government would sincerely approach and engage with all the stakeholders for a collective and collaborative actions to make Ladakh one of the cleanest destinations.

- **Government Offices -** Government Offices, especially public offices should be the places of demonstration for model practices of solid waste handling. Source segregation with colour coded bins, composting, resource recovery, green protocol, complete ban of plastic bottles, etc. should be practiced in the Government offices and other institutions. The administration of UT Ladakh has already banned use of plastic water bottles in UT Ladakh vide order no.: 40-LA(GAD) of 2020 dated: 23.06.2022.
- **Citizens -** Series of enabling campaign for public would be planned, and it should continue till 2025. The campaign should address specific local issues, behavioural issues of people, best practices etc. Health impact of plastics, including impacts of burning of waste and their impact on the environment shall be shared in public to build a public opinion to reduce the use of plastics. Initiation of proper and scientific education on menstruation with the support of Department of Health will empower young girls of reproductive age and women in choosing right solution for menstruation. The Local Authorities with the support of UT Administration will initiate napkin vending machines which will dispense plastic and toxic free disposable napkins and / or reusable cloth napkins. Subsidies and financial support shall be provided to enterprising people who are interested in taking up businesses of alternate eco-friendly products and services.
- **Private Institutions and Unions –** Ladakh's economy thrives on united fronts and inputs from private institutions such as All Ladakh Hotel and Guest House Association (ALHGHA), trade unions, bikers' union, monasteries, etc. The combined waste generation in these areas make them a significant contributor. The Government through stakeholder consultations shall include discussions for waste management process. This shall involve community waste collection and management, peer-to-peer monitoring, waste management campaigning, awareness creation, and community charges and cooperation. Community representatives shall be responsible for the engagement and monitoring of residents and other stakeholders.
- **Tourists -** Ladakh is ecologically sensitive area, and it receives a large number of tourists from across the globe. The hospitality, commerce, and tourism industry, which form a direct beneficiary of the tourism industry, also is a sensitive industry when it comes to rules and

regulations. The Government through the Department of Tourism, Local administration and with the support of hoteliers' association, tour operators, bike agencies, etc. will launch a campaign to advertise the salient features about new approach towards safe handling of solid waste. The relevance of such approach for conservation of natural resources and responsible tourism will be pitched in the messages to create awareness among tourists well before their arrival in Ladakh. Technical support of Forests, Environment and Wildlife Management Department, Eco Tourism and NGOs shall be sought to package the messages. A package of practices for responsible tourism shall be developed along with standard practices for material use, recovery, and safe disposal in the tourism / eco-sensitive places.

- **Students / Youths -** Campaigns, projects and activities shall be designed for involving students and youth in the UT to invoke sense of ownership and to sustain the campaigns. Local Authorities shall create opportunities for academic exercises on waste, material use, behaviour change communication, social work, rural planning etc, where the students and youth can participate. The Human Resource Development Department shall initiate process to integrate green clubs, climate volunteers, scouts and engaging with existing student initiatives such as scouts / guides, National Cadet Corps, etc. in the educational institutions to create an environment for the campaign on waste management.
- **Scrap Dealers / Waste Pickers** from the informal market contribute in a significant way to link non-biodegradable from households to recyclers. Recognising authentic and reliable agents / scrap dealers would incorporate them into the system and their network / links could be used for effective resource.

5.6 Monitoring Arrangements

Regular monitoring of performance of the local bodies in the realm of urban sanitation would be integral for achieving and sustaining the improvements. Along with mandated monitoring systems as per the SBM and SBM (U), a UT level performance monitoring system and IT-enabled dashboard will be set up in coherence with the Swachh Survekshan and Garbage Free City parameters. These parameters, along with sanitation ratings and urban sanitation index for Ladakh will be extended to cover all the local bodies in the state. The Urban Sanitation Index would be put in the public domain for citizens who can become aware about the performance of their city and help in social auditing.

E-governance module for grievance redressal system would be developed and launched for citizens to lodge their sanitation–related complaints. Both, internet based as well as telephone-based applications for lodging complaints would be developed to reach the furthest consumers in the UT. Statutory Reporting Arrangements (Table-5), and status of policy, plan, regulation & monitoring (Table-6) are showcased in Point no. 8 in Annexure.

6.1 Time-bound plan of Action

The UT Administration of Ladakh is taking up following time-bound actions to achieve sanitation goals.

Table 3 Time bound action plan

Sl. #	Key Activities & Milestones	*Time limit w.e.f. May 1st, 2022
1	Finalization of all related policies, bye-laws at the UT and Local Level	02 months
2	Setting up of all the Committees/Taskforces at the UT and Local Level	02 months
3	Identification and procurement of suitable sites, including obtaining necessary environmental clearances, for setting up solid waste processing facility and sanitary landfill facilities	03 months
4	Engagement of a UT level agencies for IEC/BCC and Capacity Building	03 months
5	Engagement of Consultants for preparing DPRs	03 months
6	Enforcing waste generators to practice segregation of bio-degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source	03 months
7	Completion of procurement of bins, C&T vehicles, PPE kits as may be estimated in the DPRs	05 months
8	Completion of commissioning of all SWM processing plants, MRFs and SLF	01 year
9	Ensuring 100% door-to-door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	01 year
10	Ensuring 100% separate storage, collection and transportation of construction and demolition wastes	01 years
11	Ensuring 100% separate storage, collection, and transportation of bio-medical wastes in collaboration with the Health Department and PCC	01 years
12	Completion of Bioremediation or capping of old and abandoned dump sites	3 years

Table 4 Status of implementation, viz-a-viz, Target in MSWM Rule 2016

S. No.	Activity	Time limit from the date of notification of rules	Status
1	Identification of suitable sites for setting up solid waste processing facilities	1 year	Done
2	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or standalone sanitary landfill facilities by all local authorities having a population of 0.5 million or more	1 year	Yet to be achieved
3	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities	1 year	Achieved for Kargil, In progress in Leh
4	Enforcing waste generators to practice segregation of bio-degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source	2 year	Segregation at source complied for dry & wet waste

5	Ensure door-to-door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities	2 year	D2D Collection complied, transportation in separate vehicles complied, transportation in covered vehicles yet to be achieved
6	Ensure separate storage, collection and transportation of construction and demolition wastes	2 year	Not applicable
7	Setting up solid waste processing facilities by all local bodies having 100000 or more population	2 year	Not applicable
8	Setting up solid waste processing facilities by local bodies and census towns below 100000 population	3 years	Achieved in MC-Leh, MC-Kargil under process
9	Setting up common or standalone sanitary landfills by or for all local bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the Rules	3 years	Not applicable
10	Setting up common or regional sanitary landfills by all local bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules	3 years	Not applicable
11	Bioremediation or capping of old and abandoned dump sites	5 years	Capping in progress in MC-Leh, tendering for engaging agency yet to be initiated

Annexures

The salient features of the SWM Rules, 2016 are as under:

1. **Areas Covered:** These rules are applicable to:

   i. Every local body (Urban and Rural),
   ii. outgrowths in urban agglomerations,
   iii. census towns as declared by the Registrar General and Census Commissioner of India,
   iv. notified areas,
   v. notified industrial townships,
   vi. areas under the control of Indian Railways,
   vii. airports/ airbases,
   viii. Ports and harbours,
   ix. defence establishments,
   x. special economic zones,
   xi. State and Central government organisations,
   xii. places of pilgrims,
   xiii. religious and historical importance as may be notified by respective State government from time to time, and,

xiv. every domestic, institutional, commercial and any other non-residential solid waste generator situated in the areas.

2. The Waste Generators

- Every household
- Event organizers
- Street Vendors
- RWAs & Market Associations
- Gated Community having more than area 5000 sq. m.
- Hotels & restaurants,
- Defence establishments, etc.

3. a. Duties of Waste generators:

i. Every Waste Generators will segregate waste and store separately and hand over to Municipal workers or authorized waste pickers.
ii. The duties shall also include any duties as mentioned in SWM Rules, 2016, unless otherwise mandated by UT-Administration, or Central Government.

b. Duties of Authorities:

i. Ministry of Environment, Forest & Climate Change will constitute 'Central Monitoring Committee' to monitor and review every year.
ii. MoHUA will frame National Policy on SWM and coordinate with States/UTs, provide technical guidelines, financial support, training to local bodies, etc.
iii. Departments of Fertilizers & Chemicals will assist in market development for city compost and make available to companies (3/4 bags compost: 6/7 bags Fertilizers).
iv. Ministry of Agriculture will make flexible Fertilizer Control Order, promote utilization of compost, testing facility for compost and issue guidelines.
v. Ministry of Power will fix tariff of power generation from W-T-E project and ensure distribution through companies.
vi. MNRE will facilitate infrastructure for waste-to-Energy plants and provide subsidy.
vii. Secretary- In-charge, UD (sate/UT) will prepare State Policy/Strategy, adopt 3- Rs, coordinate for state planning, identification of common/regional landfills, notify guidelines of buffer zones.
viii. District Collector/Magistrate will facilitate identification of landfill site, quarterly review the performance of local bodies. (x) Secretary, Panchayats: same as Secy. UD at Panchayat level.
ix. CPCB will coordinate with SPCBs/PCCs for monitoring and Annual Reports, formulation of standards, review new technologies, prepare guidelines for buffer zones restricting from residential,

commercial and construction activities areas, and inter-state movement of waste.

x. Local Authority/Panchayats will prepare SWM plan with timeline and its implementation, segregate, adopt 3-Rs, material recovery, processing/ disposal of Waste, user fee and levy spot fine.
xi. SPCBs/PCCs will monitor, issue authorization, and regulate.
xii. Manufacturers/Brand owners will facilitate collect back wastes of their products and provide pouch for packaging sanitary wastes, etc.
xiii. Industry (cement, power plant, etc.) will use RDF within 100 km.
xiv. Operator of facilities will follow guidelines/standards
xv. The duties shall also include any duties as mentioned in SWM Rules, 2016, unless otherwise mandated by UT-Administration, or Central Government.

4. Criteria for Hilly Region:

Avoid landfill, make waste transfer stations, strict action for littering and construct landfill at plain areas. Further provisions shall be subject to provisions of the SWM Rules, 2016.

5. Waste to Energy plant:

For waste with 3500-4000 Kcal/kg and above for co-incineration in cement and power plants. Non-recyclable waste having calorific value of 1500 Kcal/Kg or more shall not be disposed off on landfills and shall only be utilised for generating energy either through refuse derived fuel or by shredding and reuse in roadworks.

6. Resource Recovery:

(i) Waste Pickers

Active waste pickers in the region will be organized and integrated to the formal system, to expand the potential of resource recovery through forward linkages to recycling network.

(ii) Scrap dealers / traders

Local waste traders will be integrated to facilitate aggregation of non-biodegradable discards, sorting, cleaning, and diversion to recycling. The Government will initiate a process to standardize the existing practices of scrap dealers to ensure occupational safety, pollution control and social security.

(iii) Swap Shops

Swap Shops are facilities which facilitate exchange of reusable goods like, garments, household equipment / utensils, books, furniture, etc. Swap shops adds value to reusables by minor repair or refurbishing activities. This mechanism will reduce the consumption of newer products to an extent and will inculcate a culture for caring and sharing of materials in the community. Swap shops are taking place in different parts of the country as a solution for safe recovery of resources and resource conservation.

(iv) Material Recovery Facilities

MRF[12] means a facility where non-compostable solid waste can be temporarily stored by the local body or any other entity or any person or agency authorised by any of them to facilitate segregation, sorting, and recovery of recyclables from various components of waste by Government authorities or Self-governing local bodies. Informal sector of waste pickers, informal recyclers or any other work force engaged by the local body or entity for the purpose before the waste is delivered or taken up for its processing or disposal to Material Recovery Facilities will attract only low value discards since the valuables are skimmed by informal sector at the source. MRFs are the local aggregation centres for low value non-biodegradable discards like plastics, mixed paper, glass bottles etc. It will also act as temporary storage space for household level hazardous waste and E-Waste. E-Waste should be primarily stored and disposed off as per E-Waste Management Rules, 2016 and hazardous waste as per Hazardous Waste Management Rules, 2016.

(v) Resource Recovery Centres

RRCs are larger common facilities at Local Authority level to integrate MRFs to add value to low value discards through sorting, cleaning, pre-processing and aggregation. RRCs will hold household hazardous waste and E-waste and will facilitate its disposal through authorized service providers.

(vi) Construction and Demolition Waste sites

Rapid urbanization results in increased demand for building materials as well as increases the construction and demolition waste. These inert waste materials will be collected and stored, processed for further use as daily cover for existing sanitary landfills and raw material for non-structural construction as per the provisions laid in the Schedule II of Construction and Demolition Waste Management Rules 2016. Local Authorities[13] will be responsible for segregated collection, transportation and recycling of construction and demolition materials. A construction and demolition plant shall also be set up for the same. Site identification shall be identified by respective Development Departments, along with local bodies per their jurisdiction with concurrence from Ladakh Pollution Control Committee.

7 (a) Infrastructure for Management of Biodegradable Discards

(i) Source Level management

Simple and easy to use aerobic composters made of plastic, metal or earthen wares will be used for composting at household level or institutional level, where the quantity of waste is less than 5 kg / day. These devices will be operated with or without specially formulated effective micro-organisms.

- For households having waste more than 5 kg / day, anaerobic digestion coupled with composting for slurry management is suggested
- For institutions having waste from 10 kg – 50 kg per day will opt for Aerobic Composting Bins

[12] Sec. 3(31) Solid Waste Management Rules 2016- Ministry of Environment, Forest and Climate Change – Govt. of India Notification 8th April 2016

[13] Sec.6, Construction and Demolition Waste Management Rules 2016, Ministry of Environment, Forests and Climate Change – Government of India. 26 March 2016

- For institutions that do not have outdoor space will opt for mechanized composting devices. The minimum waste requirement is 20 kg and can go up to 250 kg
- Institutions generating more than 500 kg biodegradable discard which are dominated by cooked food / meat / fish waste will opt for hi-tech biogas plant

(ii) Cluster Level management

At cluster level, **Organic Aerobic Waste Composters (OAWC)** may be used to handle up to 1000 kg quantity of waste per day. At places where it is affordable, mechanized composting devices will be used. Hi-tech biogas plants are recommended for clusters where biodegradable discards are dominated by cooked food / meat and fish waste. Mobile aerobic composting units will be made available to use it in temporary venues like expos. The Local Authorities with the support of district administration will procure appropriate land/space available to set up cluster level aerobic composting facilities. Cluster level composting areas shall be identified for areas where home composting is not feasible.

(iii) Common facility

At the Regional / Municipal level **Aerobic Composting Plant** will be used to handle the waste. Existing common facilities for composting will be revived and modified for capacity augmentation or repaired for efficient functioning. Options for waste to energy, biogas plant, composting facility to be explored looking at the technological and economic feasibility.

(iv) Odour Control Management

Comprehensive odour prohibitive system would be devised with installation of ventilation ducts, exhaust fans, spraying of enzyme catalytic solution on processing facility that can be applied to the surface of the compost windrow or sprayed in the airspace above it, development of 5mt green belt all around the site is provided to prevent any odour, dust, and anaesthetic visuals. Turning the windrows is very important for redistributing the moisture, providing aeration, and maintaining even temperatures. The optimum frequency of turning depends on how thoroughly materials are mixed initially, the C:N ratio, any existing anaerobic conditions, and porosity of the windrows. Appropriate sizing the windrows uniformly facilitates oxygen diffusion and natural air convection.

7 (b) Infrastructure for Management of Non-Biodegradable Discards

(i) Cluster Level Management

At cluster level **Material Recovery Facility** may be set up strategically. An MRF should have a minimum of 200 sq. ft. floor area to store non-biodegradable discards. Mobile MRFs will be set up for Local Authorities who cannot afford to find space for cluster level MRFs. MRFs can be larger colour coded bins which are manned by the Local

Authority and is placed in places near markets, commercial streets etc. The Local Authorities should make it mandatory to establish at every commercial establishment, a bin for taking back plastic packaging materials and containers. These bins at the premises of the commercial establishments can act as mini MRFs for plastic waste and will be integrated with the waste pick up network of the Local Authority for final disposal. The Plastic Waste Management Rules provide for EPR for manufacturers, brand owners and distributors of products that are packed in plastics. The Local Authority will make the brand owners of leading noodles manufacturers, milk product manufacturers, breweries etc. responsible for setting up cluster level MRFs or for supporting collection and transportation of single use low-value plastic waste. The LSGs will conduct brand audit of plastic waste in the region to ascertain the share of brands and manufacturers to fix the responsibility.

(ii) Common Facility

At the Regional / municipal level, Resource Recovery Centres would be set up which has facilities to clean, sort, shred, disassemble, and bale non-biodegradable discards. RRC should have a minimum of 1000 sq. ft. floor area.

7(c) Proposed infrastructures for other category of wastes:

a) Construction and Demolition (C&D) Waste Plant

Open yard or semi-open yard with a minimum of 5000 sq. ft. is needed to be provided for stocking construction demolition waste for further process to make it available for construction purpose. Based on the feasibility assessment, the UT Administration of Ladakh will set up a regional C&D plant at strategic locations. This plant will also serve citizens and private sector. Suitable order for proper handling and transportation of the C&D waste to be issued by the respective authorities. Suitable formal arrangement with Border Roads Organization, NHIDCL would be worked out for reuse of the crushed materials from the regional facility.

b) Sanitary / Engineered Landfill (SLF)

A method of disposing of refuse on land without creating nuisance or hazard to public health or safety, or without affecting the air, water, and soil quality by utilizing the principles of engineering to confine the refuse to the smallest practical area, to reduce it to the smallest practical volume and to cover it with a layer of earth at least at the conclusion of each day operation or at such more frequent interval as may be necessary. In Ladakh, sanitary land filling will be restricted to non-biodegradable, inert waste and other waste that are not suitable either for recycling or for biological processing. Land filling will also be carried out for residues of waste processing facilities as well as pre-processing rejects from waste processing facilities. The strategic regional SLF sites would be identified based on the criteria prescribed by the CPHEEO/CPCB and should be vetted by the Ladakh Pollution Control Committee. Landfill sites shall be set up as per the guidelines of the Ministry of Housing and Urban Affairs, Government of India and Central Pollution Control Board. Criteria for Landfill site selection shall

be as per Solid Waste Management Rules,2016. The landfill site shall be large enough to last for at least 20-25 years.

i. Before establishing any landfill site, baseline data of ground water quality in the area shall be collected and kept in record for future reference.
ii. Landfill gas control system including gas collection system shall be installed at landfill site to minimize odour pollution.
iii. Inert waste to be sent to sanitary landfill site

c) Bio-mining/bioremediation for Closure and Rehabilitation of Old Dumps

As per the Rule 15, duties and responsibilities of local authorities and village Panchayats of census towns and urban agglomerations; the local authorities and Panchayats will investigate and analyse all old open dumpsites and existing operational dumpsites for their potential of bio-mining and bioremediation and wheresoever feasible, take necessary actions to bio-mine or bio-remediate the sites.

Dump sites which have reached their full capacity or those which will not receive additional waste after setting up of new and properly designed sanitary landfills would be closed and rehabilitated by examining the following options:

a. reduction of waste by bio-mining and waste processing followed by placement of residues in new landfills or
b. capping with geomembrane to enable collection and flaring / utilisation of greenhouse gases.

In absence of the potential of bio-mining and bioremediation of dumpsite, it will be scientifically capped as per landfill capping norms to prevent further damage to the environment.

Table 5 Statutory Reporting Arrangements

Sl. #	Action Points	Reporting Agency	Authority	Frequency
1	Quarterly Progress Report	Advisor / Chief Secretary	Hon'ble NGT (with a copy to CPCB)	Quarterly
2	Six monthly review report	State Level Advisory Body	Ladakh Pollution Control Committee	At least Every Six Months
3	Form-III	Concessioner/Plant Operators	Respective Local Bodies	Annually
	[see rule 19 (6), 24 (1)] Format of annual report to be submitted by the operator of facility to the local body			30th Day of April, every year
4	Form-IV	Local Bodies	Ladakh Pollution Control Committee and Secretary-in-charge, H&UDD	Annually
	[see rules 15 (za), 24 (2)] Format for annual report on solid waste management to be submitted by the local body			Before 30th Day of June, every year
5	Form-V	Ladakh Pollution Control Committee	Central Pollution Control Board, MoHUA	Annually
	[See rules 17 (2)] Format for annual report on plastic waste management to be submitted by the local body			By 31st day of July, each year
6	Review Report	District Level Task Force	State Level Advisory Body	To be decided by the UT

Table 6 Status of Policy, Plan, Regulation & Monitoring

Sl. #	Action Points	UT Departments (including PCC)	District	MC-Leh	MC-Kargil	GP
1	Notification of UT Level Policy and SWM Strategy	✓				
2	Setting up of UT Environment Monitoring Cell	✓				
3	Setting up of District Environment Monitoring Cell		✓			
4	A four-member special taskforce for every district for creating awareness of SWM Rules, 2016		✓			
5	UT Level Advisory Body for SWM	✓				
6	Preparation & notification of Bye-laws			✓	✓	✓
7	UT Level Advisory Committee for taking up measures to eliminate single use plastic	✓				
8	UT Level Special Taskforce for taking up measures to eliminate single use plastic	✓				
9	District Level Taskforce for taking up measures to eliminate single use plastic		✓			
10	Solid Waste Management Action Plan for Rural Ladakh		✓			
11	Solid Waste Management Microplanning • MSW Processing GAP analysis and action plan • Legacy waste dumpsites remediation action plan			✓	✓	✓
12	Preparation of SWM DPR			✓	✓	?
13	Notification for prevention of littering in public places		?	✓	✓	?
14	Notification for banning of single use plastic and plastic bottles	✓	✓	✓	✓	✓
15	Notification for banning of burning of waste		?	✓	✓	?
16	Notification for management and handling of C&D Waste			✓	✓	?
17	Green Hotel Guidelines			✓	✓	✓
18	Constitution of Flying Squads			✓	✓	✓
19	Setting up of digital surveillance		?	✓	✓	?
20	Promotion of Green Public Procurement	✓	✓	✓	✓	✓
21	Annual District Environment Plan		✓			
22	IEC/BCC Planning for GFC		?	✓	✓	?

8. Regulations pertaining to city sanitation and waste management

Table 7 Regulations pertaining to city sanitation and waste management

Sl.#	Policy	Authority	Description
1.	Batteries (Management and Handling) Rules, 2001	MoEF&CC	These rules apply to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer, and bulk consumer involved in manufacture, processing, sale, purchase and use of batteries or components
2.	National Urban Sanitation Policy, 2006	Ministry of Housing and Urban Affairs (MoHUA)	Broadly covers aspects of urban sanitation, with a specific focus to eliminate open defecation in cities. Focus on re-orienting institutions for developing city-wide approach to sanitation, covering all its aspects including Solid Waste Management
3.	CPHEEO Guidelines, 2013	Central Public Health and Environmental Engineering Organization (CPHEEO)	Several guidelines have been published with technical details and management rules for storm water drainage, waste management, sewerage etc.
4.	Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013	Ministry of Social Justice and Empowerment	To provide for the prohibition of employment as manual scavengers, rehabilitation of manual scavengers and their families
5.	Swachh Bharat Urban Guidelines, 2014	MoHUA	The Swachh Bharat Mission - Urban (SBM-U), launched on 2nd October 2014 aims at making urban India free from open defecation and achieving 100% scientific management of municipal solid waste in 4,041 statutory towns in the country.
6.	Solid Waste Management Rules, 2016	CPCB	These rules are applicable to every Municipal Authority for collection, segregation, storage, transportation, processing, and disposal of municipal solid waste.
7.	Hazardous and other wastes (Management and Transboundary Movement) Rules, 2016	Central Pollution Control Board (CPCB)	Notified to ensure safe handling, generation, processing, treatment, package, storage, transportation, use reprocessing, collection, conversion, and offering for sale, destruction, and disposal of hazardous Waste.
8.	Construction and Demolition Waste Management Rules, 2016	CPCB	In line with the Solid Waste Management Rules, 2016, the CPCB has issued the Construction and Demolition Waste management rules to be followed by each State Pollution Control Board to ensure proper management and disposal
9.	Plastic Waste Management and Handling Rules, 2016	CPCB	The CPCB has issued guidelines for management of Plastic waste by producers, processors, and recyclers.
10.	Bio-medical Waste Management Rules, 2016	Ministry of Environment, Forest, and Climate Change	The policy is formulated to improve the collection, segregation, processing, treatment, and disposal of these bio-medical wastes in an

Sl.#	Policy	Authority	Description
			environmentally sound management
11.	E-waste (Management) Rules, 2016	CPCB	These rules formulated, apply to every manufacturer, producer, consumer, bulk consumer, collection centres, dealers, e-retailer, refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment
12.	National Policy on Faecal Sludge and Septage Management (FSSM), 2017	MoHUA	The policy entails guidelines on design for sewerage and sludge management solutions.
13.	Swachh Bharat Urban Guidelines 2.0, 2020	MoHUA	The Swachh Bharat Mission - Urban (SBM-U), launched in October'21 aims at making urban India free from open defecation and achieving 100% scientific management of municipal solid waste in ___ statutory towns in the country.
14.	Other Relevant Rules and Task Force Reports	-	• Inter-ministerial Task Force on Integrated Plant and Nutrient Management using City Compost, 2005 • Fertilizer Control Order (FCO), 2009; PROM, 2013 by Ministry of Agriculture Report of the Task Force on Waste to Energy, Planning Commission, 2014

9. Targets and Indicative Timelines:

Table 8 Target and indicative timelines - Leh

Sr. #	Project Name	Status	Cost in Cr.	Sept '22	Oct '22	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sept '23	Oct' 23
1	Implementation of ICT based Monitoring Mechanism for Collection, Transportation and Processing Disposal of Waste. This would result in route optimization, fuel efficiency of the vehicles and prevention of any pilferages.	Feasibility study and Tender Preparation under process	2														
2	Fleet modernization for efficient primary and secondary collection	Planning and feasibility study under progress	TBD														
3	Upgradation in designed capacity and mechanization of existing Processing Plant	GAP Analysis in Progress with scope for Solar Energy Intervention	1														

4	Construction and Demolition Waste Processing Unit	Site finalization and stakeholders' consultation in progress. Technical pre-feasibility for solar energy integration possibilities ongoing.	1														
5	Twin Bin Systems for waste collection to be implemented at public, commercial and tourist places to avoid open littering.	Requirement Assessment in progress with location finalization	0.5														
6	Outsourcing of Primary and secondary waste collection including street sweeping	Planning and feasibility under progress	TBD														
7	Bio-methanation Plant with Designed Capacity of 15 TPD to process Wet/ Organic waste and produce green energy from Biogas and digested slurry to be used as organic manure	Suitable technology options are under review to ensure functionality in extremely cold climate. Technical pre-feasibility for solar energy integration possibilities ongoing.	20														
8	Construction of a MSW transfer station with MRF facility	Site finalization and stakeholder consultation in progress. Technical pre-feasibility for solar energy integration possibilities ongoing.	4														
9	Biomining of 100000 MT of Legacy waste at Bombguard	Construction started	11.5														
10	Transportation of inert waste after biomining and bioremediation	Negotiation ongoing with the existing vendor doing biomining	TBD														

Sr. #	Project Name	Status	Cost in Cr.	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
1	Bioremediation and landfill capping for approximately 30000 MT of Legacy Waste	Site survey and planning in progress for winter-friendly and universal access with provision for solar energy	4									

2	Compost Plant with designed capacity of 10 TPD to process organic waste and Dry waste processing unit with designed capacity of 05 TPD	Setting up of plant ongoing	14									
3	Implementation of ICT based Monitoring Mechanism for Collection, Transportation and Processing Disposal of Waste. This would result in route optimization, fuel efficiency of the vehicles and prevention of any pilferages.	Feasibility study and Tender Preparation under process	1.5									
4	Twin Bin system for waste collection to be implemented at Public, commercial and tourist places to avoid open littering	Requirement Assessment in progress with location finalization	TBD									
5	Collection segregation and recycling center for construction and demolition waste	Site finalization and stakeholder consultation in progress. Technical pre-feasibility for solar energy integration possibilities ongoing.	TBD									
6	Transfer Station and MRF facility with designed capacity of 5 TPD integrated with bailing facility along with a vehicle for transportation to Kargil	Planning and Feasibility study in Progress	TBD									
7	Sanitary Landfill for Kargil	Site identified. EIA to be done for obtaining consent to establish	TBD									

ANNEXURE-B

PLASTIC-SMART URBAN LADAKH
STRATEGY & ACTION PLAN

सत्यमेव जयते

DIRECTORATE OF URBAN LOCAL BODIES, UT LADAKH

September 2022

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2.13 Executive summary

Ladakh is a tourism hotspot due to its untouched nature and serene landscapes. However, with the rapidly growing rate of urbanization and rise in tourism numbers, there has been a significant increase in waste generation. The urban centres and towns are yet to have a comprehensive waste management system in pace comprised of seamless collection, segregation, disposal, recycling, or processing infrastructure. However, the administration is aware of the fact that the continuance of the same shall be devastating and hence a comprehensive approach has been envisaged.

Currently, the UT administration has taken up initiatives like banning Single Use plastic at ULB level, preparation of Municipal Solid Waste Management Byelaws, 2022 for the ULBs, setting up Material Recovery Facility (MRF) in the cities, organizing enforcement drives and awareness campaigns and more.

Plastic waste has unique issues and triggering environmental hazards associated to it. Therefore, the UT administration has taken a conscious decision to have a dedicated Plastic Waste Management Strategy and Action Plan to spearhead a fight to mitigate the challenges. The Action Plan lays out strategies for governance, practice and awareness creation which includes legal and enforcement strategies, infrastructure requirements for source-segregation, transportation, disposal and recycling strategies and hazard management.

The Scope of this Strategy and Action Plan is primarily limited to the Urban Areas, however, the interventions may further be extended to entire UT.

2.14 1. Introduction

1.1 The Union Territory of Ladakh

Ladakh became a Union Territory on 31st October 2019. Surrounded by significant mountain ranges of Himalayas and Karakoram, Ladakh has been a strategic location at the crossroads of important trade routes. Currently, UT-Ladakh is known for its significant tourism potential and strategic military location. With a total area of 59,146 sq. km., ranging between 2,550 m (8370 ft) and 7,742 (25,400 ft.), the region houses

Figure 5 The Union Territory of Ladakh

around 275,000 people with a density of 4.6 people per sq.km. The UT has two districts – Leh and Kargil, with Leh as the capital city of the UT. The population of Leh as per 2011 Census is 30,870 with a growth rate of 59.47%, while that of Kargil is 16,338 with a growth rate of 53.31%

1.2 Urban Ladakh and emerging trends

1.2.1 Urban Local Bodies of Ladakh

The two towns of Ladakh, i.e., Leh and Kargil both have their own Municipal Committees, while Ladakh Autonomous Hill Development Council (LAHDC) has shared responsibilities for the development of the two cities. Leh and Kargil both comprised of 13 municipal wards each. Each Municipal Committee is responsible for Waste Management in the respective towns.

Table 9 Wards in MC Leh and MC Kargil

Constituents of Urban Ladakh		
Sr. No.	**Leh Municipal Committee**	**Kargil Municipal Committee**
1	Gonpa Gangles	Chanchik
2	Sankar Yourtung	Chanchikk
3	Changspa Karzoo	Thakskhan Grong Lankore
4	Tukcha	Drethang Balti Bazaar
5	Shenam	Dass Pisho
6	Skara	Goma Kargil – I
7	Skalzangling	Goma Kargil – II
8	Murtsey	Poyen
9	Housing Colony B	Poyen Bagh-i-Khumini
10	Housing Colony A	Baroo-I
11	Maneytselding	Baroo-II
12	Skampari	Baroo-III
13	Zangsti Skynos	Baroo-IV

Table 10 Summary Data for MC Leh and Kargil

Sr. No.	Description	MC Leh	MC Kargil
1	Total Area (in sq km)	9.15	8.93
2	Total Population (as per 2011 Census)	30870	16338
3	Total no. of Households (as per 2011 Census)	7360	2446
4	Total Wards	13	13

1.2.2 Smart city and other urban development interventions

Ladakh is adopting various urban measures in-line with Central schemes to boost the development of the Union Territory. The cities are mobilizing projects to develop the city on the lines of Smart Cities in India. The project aims at developing the city in a more sustainable manner by identifying measures for integration with an Integrated Control and Command Centre, and converging the various projects and ideas with centrally sponsored schemes like AMRUT 2.0, SBM 2.0, PM-Svanidhi, etc. The projects also dive into identifying garbage and waste hotspots, reusing legacy waste sites and providing a comprehensive cleanliness program, as well as cleaning of market spaces and reduction of plastic waste.

The UT has already taken various measures for a better waste management under various schemes like putting up the twin bin system in public spaces, procurement of machinery and equipment, stakeholder consultations, etc. The measures have initiated various projects in the two districts and primed to see further initiatives in the upcoming years.

1.2.3 Municipal waste Pollution and waste management scenario in Leh and Kargil

Table 11 Current Waste Management in MC Leh and Kargil

Sr. #	Description	MC Leh	MC Kargil	Total Urban
1	Population	30870	16338	47208
2	Number of Business Establishment (2021)	586	1500	2086
3	Total Number of Households	7360	2446	9806
4	Number of households covered by door-to-door collection	100%	100%	100%
Current Generation				
4	Quantity of Plastic Waste generated during the year from area under jurisdiction (in tons)	1467.84 Tons	447.21 Tons	1915.05 Tons
5	Quantity of plastic waste collected during the year from area under jurisdiction (in tons)	1467.84 Tons	447.21 Tons	1915.05 Tons
6	Quantity of plastic waste channelized for recycling during the year (in tons)	1174.27 Tons	245.96 Tons	1420.23 Tons
	Quantity of plastic waste channelized for use during the year (in tons)	293.57 Tons	NA	293.57 Tons + NA
Existing Facilities				

7	Municipal MSW Processing Plant	1	1 (Under construction)	-
8	Number of Sanitary Landfill Sites (SLF)	1 (Under construction)	1 (proposed)	-
9	Number of Material Recovery Facility (MRF)	-	-	-
9	Local body's own manpower deployed for collection including street sweeping, secondary storage, transportation, processing and disposal of waste.	128	37	-

The waste management in urban areas of Ladakh is primarily undertaken in two ways:

iii. The waste is collected and sent to landfills
iv. The waste is sent to a Material Recovery Facility (MRF), what's recyclable is sold to recyclers, what's not is sent to incinerators

The safai karamcharis who provide door-to-door collection service use thermocol boxes as compartments and segregate household waste. Some bulk generators like hotels and guest houses have their own on-site facility to recover plastic waste, as well as segregate wet and dry waste. Currently, Leh and Kargil has 100% source segregation of waste. The primary waste generators in UT Ladakh include both bulk waste generators and domestic waste generators. The household waste is generally given without any segregation, thus becoming convoluted by the plastic along with the dry and wet waste generated. This mixed waste is then sent to MRFs, then the unrecyclable or non-salvageable material is sent to landfills or incinerators which further causes harm. The bulk waste generators, as per Solid Waste Management Rules, 2016, like hotels, hospitals, nursing homes, clinics, commercial markets, schools, colleges, universities, other educational institutions, government buildings, etc. may have average waste generation capacity of more than 100 kg per day. Since plastic currently lacks various economical and available alternatives, it stays in circulation and causes further deterioration in the habitat, as well as in the nature. Limited institutional, infrastructure and operational capacity are the biggest challenges in mitigating plastic waste in the UT. Plastic Waste Management Rules, 2016 mandates the management of Plastic Waste and to be

1.2.4 Why plastic waste is a potential threat to Ladakh ecology?

A tourism hub due to its pristine nature, Ladakh has become a prime destination for tourists both local and global. With the COVID restrictions easing and summers approaching, this number is feared to go up substantially. The resident population of the towns and the rural areas of the UT is 2,74,289 (as per 2011 census), however, the region witnesses a significant rise in the floating population during the tourist season, i.e., April to October. In 2019, a total of 2,79,937 tourists came to visit the UT. This significant population rise also leads to a huge amount of plastic waste generation in the region. Earlier, these wastes were taken to the dump sites, incinerated, or disposed of without following the norms of scientific waste handling measures, thus creating environmental and health hazards in the regions. There is significant generation of plastic waste by the bulk waste generators such as hotels, schools, industries, etc. The Table-3 gives a glimpse to the

present status of waste management in Leh and Kargil. This has however given rise to a plastic and waste generation problem. Furthermore, the growing inclination towards E-commerce, that predominantly use plastic in the packing materials, has given fillip to the plastic and waste generation problem. By 2017, a research by Future Earth shows that 30,000 plastic bottles are dumped every day in Leh itself. The plastic waste has generally been dumped at the legacy waste sites, like Bombguard in Leh, or landfill sites in Kargil. Furthermore, the waste generated near water bodies are not taken care of, especially the surrounding areas of Leh and Kargil. This also gives rise to animals, both terrestrial and aquatic, to consume said plastic waste, which is not just toxic, but lethal to them.

Figure 6 Heaps of plastic goods accumulated in landfill sites of Ladakh (Source:https://www.youtube.com/watch?v=H96WZYI3WU4)

1.5 Key issues identified

A. Lack of awareness and apathy towards source segregation
B. Disposal of wastes has been happening primarily in MRF, incinerators, landfill sites, or by select bulk generators themselves
C. Indiscriminate littering leads to pollution of water bodies, public spaces and other areas creating aesthetic, social and environmental degradation
D. Plastic waste also causes choking of stormwater drains and outfalls causing inundation during rainfall.
E. The use of plastic for carrying food and other consumable materials may cause long term health hazards
F. Aquatic and terrestrial animals face lethal issues due to consumption of such wastes
G. The smaller municipalities have limited financial and enforcement capacity to identify, monitor and penalize the violators.

2.15 2. Plastic waste needs special attention

2.1 Definition of Plastic

Plastics are a group of materials, either synthetic or naturally occurring, that may be shaped when soft and then hardened to retain the given shape. Plastics are polymers. A polymer is a substance made of many repeating units. Considering the extent and importance of plastic in our society, a blanket ban would not be a viable solution, especially without economical and readily available alternatives. Therefore, a holistic approach led by the government in collaboration with the private sector and different stakeholders is critical to integrate different stages of waste management and optimize the potential value chain by adopting appropriate Reduce-Reuse-Recycling strategies.

2.2 What is Single-Use Plastic?

Plastic produced and designed to be thrown away after being used only once is termed single use plastic. This definition includes a wide array of products including products like disposable straws to vinyl flex. As per the United Nation's definition however, any plastic that is made from polymers of high-density polyethylene (HDPE), low-density polyethylene (LDPE), polyethylene terephthalate (PET), polystyrene (PS), polypropylene (PP) or expanded polystyrene (EPS) is single-use plastic. However, this wide definition does not reflect ground reality, or the policy desires in the developing world. This calls for country-based definition of single use plastics. As per the Standard Guidelines for Single-Use Plastic issued by MOEFCC, and the Plastic Waste Management Rules, 2016, plastic carry bags (virgin or recycled) with thickness less than 50 microns and plastic sheet or like, which is not an integral part of multi-layered packaging and cover made of plastic sheet used for packaging, wrapping commodities, with thickness less than 50 microns are banned.

As per the Plastic Waste Management (Amendment) Rules 2021, India is committed to mitigate the pollution caused by littered Single Use Plastics and have piloted a resolution on addressing single-use plastic products pollution. Per the amendment notified (posted on PIB on 13th August 2021), the amendment highlights the guidelines for Extended Producer Responsibility and Thickness of plastic carry bags increased from 50 to 75 microns from 30th September 2021 and to 120 microns with effect from 31st December 2022. The amendment states the ban on manufacture, import, stocking, distribution, sale, and use of single use plastics, including polystyrene and expanded polystyrene commodities, with effect from 1st July 2022 including:

a. ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol] for decoration;

b. plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic, or PVC banners less than 100 micron, stirrers.

This definition should also be expanded to include products made wholly or partly from plastic and that are not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to the producer for refill,

or reused for the same purpose for which it was conceived. In developing countries like India, many products are recycled for single-use (90% of 'single use' PET bottles) are recycled. On the other hand, disposable cutlery that can neither be recycled nor reused also falls in the category of single use plastic. Utility products like toothbrushes, even with a longer lifetime are SUPs, as well as products with shorter lifespans.

In order to stop littering due to light weight plastic carry bags, with effect from 30th September 2021, the thickness of plastic carry bags has been increased from fifty microns to seventy-five microns and to one hundred and twenty microns with effect from the 31st December, 2022. This will also allow reuse of plastic carry due to increase in thickness.

2.3 Types of Plastics

The Society of the Plastic Industry, Inc. (SPI) introduced its resin identification coding system in 1988 at the urging of recyclers around the country. The seven types of plastic include:

Marking/Labelling	Types of Plastic	Examples
	Polyethylene Terephthalate (PETE or PET)	Soda bottles, bakery products, water bottles, peanut butter jars and even in frozen foods packaging
	High- Density Polyethylene (HDPE)	plastic bottles, milk jugs, shampoo bottles, bleach bottles, cutting boards, and piping
	Polyvinyl Chloride (PVC)	Instrument panels and associated mouldings, Interior Door Panels and Pockets, Sun Visors, Seat Coverings, Mud Flaps, Underbody Coating, Auto Harness Wiring,
	Low-Density Polyethylene (LDPE)	Manufacturing various containers, dispensing bottles, wash bottles, tubing, plastic parts for computer components, and various molded laboratory equipment
	Polypropylene (PP)	plastic furniture, low friction applications, such as gears in machinery and vehicles, cleaning products, bleaches and first-aid products
	Polystyrene or Styrofoam (PS)	Refrigerators, air conditioners, ovens, microwaves, vacuum cleaners, blenders
	Miscellaneous plastics (includes polycarbonate, acrylic, acrylonitrile, butadiene, styrene, fiberglass, and nylon)	medical (for example, for dialysis housing and spectacle lenses), electro-electronic (for example, sockets, lamp covers, fuse-boxes, computer and television housings), construction (for example, stadium roofs, signs, skylights), optical storage (CDs, DVD, HD-DVDs), cars (interior lighting and headlamps, sunroofs, side windows, radiators, grilles, bumpers), packaging (for example, large water bottles)

Plastics are usually classified by their chemical structure of the polymer's backbone and side chains. Plastics can also be classified by the chemical process used in their synthesis, such as condensation, polyaddition, and cross-linking:

- **Thermoplastics:** Thermoplastics are the plastics that do not undergo chemical change in their composition, when heated and can be moulded into desired shape such as PET, HDPE, LDPE, PP etc.
- **Thermosets** - Thermoset or thermosetting plastics strengthen on heating but cannot be re-moulded or recycled such as Sheet Moulding Compounds (SMC), Fiber Reinforced Plastic (FRP), Bakelite etc. are the examples of the same.

2.4 Harmful Effects of Plastic Waste

The properties of plastic renders it various morphological and economic advantages,

Figure 7 Types of Plastics (as per recyclability)

such as being versatile, lightweight, flexible, moisture resistant, strong, and relatively inexpensive. These attractive

qualities, however, lead to over-dependence on plastic goods. The durability of plastic also renders them significantly slow to degrade. Only a very small amount (less than 10%) is effectively recycled, and the rest is sent to landfills, or to incinerators. Coupled with undeniable behavioural inclinations towards littering and unthoughtful discarding, the plastic is now causing more harm to humans, animals, and nature alike. The disposal of plastics is one of the least recognized problematic areas of plastic's ecological impact. Figure-4 showcases the ecological and health hazards of plastic.

"The versatile properties of Plastic, however, comes with its own hazards, both environmental and health. India needs its own definition and methods of disposal for plastic, especially single-use plastic"

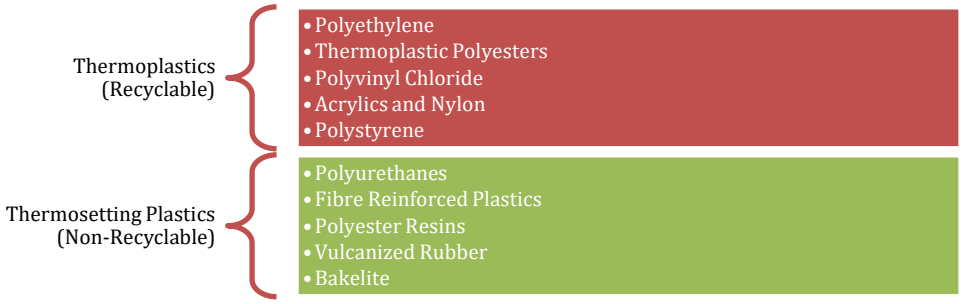


Figure 8 Environmental and Health Hazards of Plastics

2.16 3. Plastic Waste Management Initiatives

3.1 National Level Initiatives

The Ministry of Forests, (now Ministry of Forests and Climate Change) Government of India has notified Plastic Waste Management Rules, 2011, and their subsequent amendments and supersessions 2016, 2018 ,2021 and Plastic Waste Management (Amendment) Rules, 2022 by MoEFCC for effective management of Plastic Waste in the country. The salient features of rules for management of plastic waste by the urban local bodies are as under:

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

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

these technologies shall be complied with.

c) The manufacture, import, stocking, distribution, sale and use of following single-use plastic, including polystyrene and expanded polystyrene, commodities shall be prohibited with effect from the 1st July 2022: -
   - ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol] for decoration.
   - plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.

d) In order to stop littering due to light weight plastic carry bags, with effect from 30th September 2021, the thickness of plastic carry bags has been increased from fifty microns to seventy-five microns and to one hundred and twenty microns with effect from the 31st December 2022. This will also allow reuse of plastic carry due to increase in thickness.

e) Thermoset plastic waste shall be processed and disposed of as per the guidelines issued from time to time by the Central Pollution Control Board.

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

g) Responsibilities of Local bodies, waste generators, producers, importers, brand owners, etc. have been clearly defined in Plastic Waste (Management and Handling) Rules, 2011 and further amendments

3.2 UT Level Initiatives

Acknowledging the current situation in the region, the administration of UT Ladakh has come up with various Plastic Waste Management initiatives:

1) In accordance with the Plastic Waste Management (Amendment) Rules, 2021, the Housing and Urban Development Department is releasing a notification to prohibit the manufacture, stocking, distribution, import, sale and use of single use plastic commodity scheduled from 1st March 2022, including polystyrene and expanded polystyrene commodities, like earbuds with plastic sticks, plastic flags, plastic sticks for balloons, ice cream sticks, candy sticks, polystyrene (thermocol) for decoration, cups, plates, cutlery like spoons, forks, straw, knives, wrapping/packing films around sweet boxes, trays, cigarette packets, and invitation cards, glasses, plastic or PVC banners less than 100 microns, and stirrers. The said Amendment also prohibits the use of plastic carry bags less than 75 microns since 30th September 2021, and less than 120 microns from 31st December 2021.

2) Ban on plastic bottles in government and different institutions have been undertaken in the UT in June 2020 vide order no. 40-LA(GAD) of 2020 dated:23-06-2020.

3) Solid Waste Management Byelaws 2022 for the ULBs of Leh and Kargil are under process. This also incorporates suitable provisions for plastic provisions apart from the ones mentioned in Plastic Waste Management (Amendment) Act, 2021

4) 100% Waste segregation at source in Leh and Kargil

5) In pursuance of Plastic Waste (Management & Handling) Rule, 2016 as amended from time to time, and notified by the Ministry of Environment, Forest and Climate Change, Government of India, a UT Level Advisory Committee has been sanctioned to oversee the effective implementation of Plastic Waste Management Rules, 2016 (AA) in UT Ladakh vide order no. 158-LA(GAD)of 2021 dt:13-09-2021.

6) Both the Municipal Committees have conducted Stakeholders' consultations to ban single use plastic. Notification to ban of Single Use plastic in the urban areas in Ladakh is in process.

7) Municipal Committees are also working with various Bulk waste generators to contribute under Extended Producer's Responsibility

8) LPCC and Ladakh Police have initiated works to check entry of banned Single Use Plastic at entry points of UT-Ladakh at Mina Marg and Serchu vide no.: LPCC/UTL/SUP/2022/118-127 dated 25.06.2022

"The initiatives at the National Level and the UT Level shall focus on limiting the use of single use plastic, sensitizing waste generators, and formulate capacity for a comprehensive waste reduction"

2.17 4. Plastic Waste Management Strategy and Action Plan

To mitigate and manage the plastic waste and phasing out of the use of single-use plastic in the Union Territory of Ladakh, three strategic pillars have been identified. The key thrust areas for reduction of plastic wastes shall include 1) Minimize generation, 2) Efficient segregation at source, collection and transportation, 3) Efficient Processing for optimizing recycling and reuse, and 4) Scientific disposal

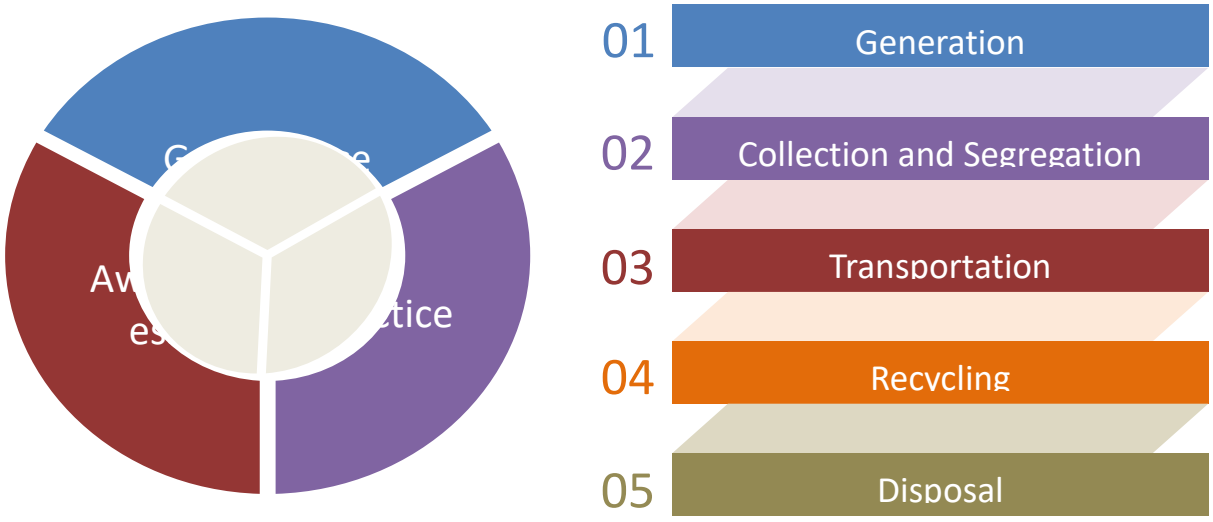


Figure 9 Pillars of Plastic Waste Management Action Plan

4.1 Governance

These solutions mandate changes through regulatory actions. These may range from banning single use plastics (strict avoidance) to imposing volume caps on plastic waste production (source reduction) by the bulk generators and the manufacturing units. The primary target of these regulatory measures is to initiate responsibilities by producers, as well as provide measures for collections and setting up protocols for treatment of such wastes. Regulatory frameworks to identify and initiate processes including but not limited to source segregation, monitoring, prevention of use of ban of plastic wastes, penalty measures, etc. The strongest stimulus is the 'polluter pays' principle, which places all costs of generated waste onto the waste generator. Some possible instruments may be fees, management prices, or appropriate schemes of Extended Producer Responsibility (EPR).

Extended Producer Responsibility in India

Figure 10 New Guidelines on Extended Producer's Responsibility (EPR) on Plastic Packaging Notified (Source: https://www.linkedin.com/posts/mygov-india_businesses-sustainable-plastic-activity-6901126604446412800-BVcy)

MOEFCC released the guideline document on 'Uniform Framework for Extended Producers Responsibility' (EPR) in June 2020 (MOEFCC, GOI, 2020), under Rule 9 of Plastic Waste Management Rules, 2016, and Guidelines for Extended Producer's

Responsibility for Plastic Packaging, 2022 on February 16, 2022. EPR is defined in the document as 'a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially the take-back, recycling and final disposal of the product'. The guidelines, based on Plastic Waste Management Rules, 2016 and further amendments, further extends the mandatory responsibilities to brand owners and importers in Indian markets, other than the manufacturers themselves. The guidelines also require the producers, processors, and recyclers to register on an online registry.

The Rule 9(1) of Plastic Waste Management Rules 2016 states that:

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

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

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

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

5 No producer shall on and after the expiry of a period of Six Months from the date of final publication of these rules in the Official Gazette manufacture or use any plastic or multilayered packaging for packaging of commodities without registration from the concerned State Pollution Control Board or the Pollution Control Committees.

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

Accordingly, three different strategies have been proposed. Plastic producers mandatorily need to choose one or more under EPR or a combination considering accessibility and ground realities in Ladakh:

i. Fee based system:

Producers/importers/brand-owners shall contribute to EPR corpus at the central level. An escrow account managed by a Special Purpose Vehicle (SPV) where private and other stakeholders can become members to be created from the fund. Contributions by each producer (on normative cost) shall be decided based on amount of plastic generated, required efforts, and money spent by ULBs to handle plastic generated in terms of plastic waste handling, collection, segregation, treatment, and processing. The fund is provided to ULBs, assemblers/recyclers and IEC Activities and may engage an UT Level Advisory Board (which may include representatives of producers) has been constituted under Solid Waste Management Rules, 2016.

ii. Producer Responsibility Organization model:

Producer Responsibility Organization (PRO) sets stage for producers to manage plastic waste in their own project under EPR Compliance. Individual producers, or collectively as a legally agreed consortium can form a PRO, to handle collection, recycling and ensure that targets are met either by themselves or engaging external waste management agencies. This also enhances circular economy in the towns. A self-managed PRO allows for boosting efficiency in cities where local bodies and UT lack the expertise, resources, or capacity to design, implement and manage effective local plastic waste management programs. They also take the responsibility for discharging producer's national and UT level obligations in a more efficient and cost-effective manner. These PROs can use mechanisms to secure plastic credits upon recycling or recovery of the collected plastic through accredited processor/exporter. The bulk generators shall incorporate PRO model to support the ULBs in exchange for service fees or plastic credits.

iii. Plastic credit-based model:

In this model, the producer shall ensure than an equivalent amount of packaging waste has been recovered and recycled to meet their obligation. Producers are mandated to acquire evidence of recycling or recovery (in form of plastic credit) from properly accredited processors (recyclers, WtE plant operators, cement co-processors, plastic utilization in roads) or exporters. The plastic credits may be exchanged for financial benefits / other terms as negotiated. The system is designed to ensure that funding may be streamline and remove blockages in the material recovery chain (like processing of low-value plastics). The bulk generators shall decide targets to achieve plastic recycling and reduction with the ULBs and PCC and provide detailed mechanism and monitoring system to achieve the plastic credits. They shall also provide alternative sources of plastic, both at their own, as well as community practice. Failure to reach benchmark levels shall induce penalties, while achievements shall involve benefits. Benchmark levels shall be decided by ULBs in collaboration with PCC. To create a

link between PRO model and the credit model, a tradable recycling credit scheme may also be added.

Actionable Measures

4.1.1 Minimizing generation

To minimize generation, the following measures are to be taken up:

1. Promotion and subsidization of alternatives of Plastic Bags, like paper bags, starch bags, cloth bags, or higher quality and recyclable plastic. Mahila starch bags and *khartak* to be promoted in Ladakh.

2. Identification and notifying public spaces in the cities to be no-plastic zone. Mass generation shall also be prohibited including but not limited to private parties, banquets, restaurants, hotels, etc.

3. Banning manufacturing and use of Single-Use Plastics by identifying stockists, retailers, and sellers of banned SUP items, and enforcing zero plastic inventory by 30th June 2022.

4. Commercial licenses to be cancelled if found selling banned SUP items. Fresh commercial items to be issued only on the condition that SUP items would not be sold; evidence of provision of alternative methods need to be shown before licenses may be issued.

5. Co-financing programs shall be created for reducing packaging waste prepared.

6. Phasing out within a period of two years shall be done for multi-layered plastic which is non-recyclable or non-energy recoverable or with no alternate use of plastic

7. Preferential procurement or Buy-back programmes under Extended Producer Responsibility, Green Protocol and Taxation Mechanism. This also increases market demand for recycled plastic. Marketing and promotion of products made from starch-based biopolymers and encourage establishing small-scale cottage industries for alternative materials. Promote research & development for finding new and viable alternatives through direct funding, awards and recognitions for innovations and leveraging government programmes to attract more investment for innovation in collaboration with other departments in the UT of Ladakh.

8. Promotion of innovative design solutions for substitution, enhancement in packaging design, promote product designs that don't require additional packaging and enables easy recycling. Collaboration with national level institutions such as Indian Institute of Packaging, etc. can help supplement the research for recyclable materials.

9. The plastic waste collection can be outsourced to private agencies and concession programs can be given to them for segregated collection and operation of MRF for optimizing reuse and recycling.

10. Plastic waste cess needs to be added in Property tax. Any exemptions on the same may be given based on evident showcase of source-segregation and adherence to

plastic waste management byelaws.

11. Cleanliness drives and enforcement near water bodies need to be conducted, and shall include CCTV cameras, patrolling and penalizing.

12. Tourists bringing plastic shall be checked at entry points to UT and penalized in accordance with quantity and type. Interventions also include

Single-use plastic product	Alternative product available in Hyderabad	Description of the product
Plastic carry bag	Starch based bags	Biodegradable carry bags made from natural starch with no chemicals or preservatives; if required, food grade colouring is added
	Cloth tote bags	Bags made by small-scale industries, SHGs & CBOs
	Paper bags	
	Jute bags	
	Recycled cotton paper bags	Discarded cloth pieces are upcycled to create handmade paper and used in the manufacture of bags and folders
Plastic water bottle, cups	Biodegradable water bottles, biodegradable cups, bio laminates	Made of natural products, free of plastic
Plastic straw	Leafy straws	Biodegradable straws made from palm leaves
Plastic garbage bag	Biodegradable garbage bags	Garbage liners made from newspaper
Plastic cutlery	Edible cutlery	Edible cutlery can be eaten as a snack after use or can be disposed of as animal feed
Plastic serve-wares	Biodegradable serve-ware	Biodegradable serve-ware: plates, bowls, spoons
	Biodegradable utensils	
Plastic cling wrap	Beeswax wrap	Biodegradable cling wrap
Diapers and sanitary items	Eco-friendly menstrual products	Biodegradable sanitary napkins, diapers, etc.

Figure 11 Possible alternatives to plastics (Source: ICLEI-SA, Enhancing Circular Economy Perspectives - Plastic Waste Management Strategy and Action Plan for GHMC)

4.1.2 Segregation and Collection

To optimize segregation and collection of plastic waste, the following measures are to be taken up:

1. Separate colored bins for biodegradable and non-biodegradable waste will be provided at household level. Provision for community bins would also be made in all public places.

2. Community bins shall be installed if no door-to door collection is possible in certain areas due to congested narrow lanes, or higher altitudes with non-feasibility due to snow covered roads

3. Primary collection of waste, in appropriately designed vehicles, will be done by the municipal conservancy workers themselves. Techno-economic feasibility and options for contracting out the collection of wastes to a competent third-party private organization/ NGO or involving the rag pickers and kabaris in the materials recovery process would also be examined.

4. The ULBs are also contemplating suitable provisions for imposing User Fee and penalty for implementing a scientific Municipal Waste (including plastic) Management due to be notified.

5. No person shall organize an event or gathering of more than one hundred persons at any unlicensed place without intimating the local bodies, at least three working days in advance. Such person or the organizer of such event shall ensure segregation of waste at source and handing over of segregated waste to the designated waste collector or agency as specified by the local body. A service charge for this is also under consideration.

6. The practice of recycling, as well as monitoring of EPR conditions by bulk generators need to be addressed and identified, and financial credit modeling shall be formulated to encourage participation by PROs and individual producers.

4.1.3 Storage and Transportation

To optimize storage and transportation, the following measures shall be taken up:

1. Suitable compartmentalized primary and secondary collection vehicles will be procured, and front-line conservancy staffs are to be trained to build capacity for better transportation of waste to the MRF.

2. Identification and provision of community bins and collection facilities shall be provisioned at the neighbourhood level, markets, and public places.

4.1.4 Recycling

To optimize recycling of plastics, the following measures shall be taken up:

1. Categorizing and recycling plastics shall be in accordance with Solid Waste Management Byelaws, 2016, Plastic Waste (Management and Handling) Rules 2011 and further amendments

2. Encouraging private organizations, start-ups, and civil service organizations to come up with innovative and environment-friendly packaging and storing materials. This

may be financial encouragement, as well as providing a platform for their research to gain traction with live projects.

3. Agencies conducting recycling works, as well as willing agencies to set up recycling plants in the MCs need to be identified and engaged.

4. Press releases and Action-taken reports are to be made public annually through websites and social media handles of the respective Municipal bodies and UT Ladakh. MIS System may also be used.

5. Periodic meetings with Stakeholders and participatory social audit will be conducted for checking progress, as well as monitoring key issues. These monitoring protocols, along with others mentioned in this action plan shall be presented to Municipal bodies.

6. Waste to Art drives and measures need to be conducted with students, youth, Civil Service Organizations and ULBs to create installations and feature them in public places, events, and festivals. Suitable prizes and remunerations can be given to best ideas.

7. Building blocks, such as *ecobricks*, and similar technologies may be explored for provisioning recycling of SUP and may be used as replacement of building blocks. Cess exemption may be provided in property tax for the usage of the same.

8. As per Rule 5 (b) of Plastic Waste Management Rules, 2016 local bodies are required to encourage the use of plastic waste (preferably the plastic waste which cannot be further recycled) for road construction as per Indian Road Congress guidelines IRC SP: 98-2013 titled as "Guidelines for the Use of Waste Plastic in Hot Bituminous Mixes (dry process) in Wearing Courses". **CPCB** in its Consolidated Guidelines of Collection, Segregation and Disposal of Plastic Waste 2017, has also quoted utilization of plastic waste in road construction as one of the technologies for disposal of plastic waste. In addition, the Ministry of Road Transport and Highways through Circular No RW-NH-33044/24/2015-S&R(R) dated November 09, 2015, has also decided to encourage the use of plastic waste in hot mix bituminous wearing coat.

4.1.5 Disposal of Plastics

To optimize disposal of plastics, the` following measures shall be taken up:

1. Land filling facility shall be restricted to non-biodegradable, inert waste and other waste that are not suitable either for recycling or for biological processing and incineration. Land filling shall also be carried out for residues of waste processing facilities as well as pre-processing rejects from waste processing facilities. Land filling of mixed waste shall also be avoided unless the same is found unsuitable for waste processing.

4.1.6 Formalizing Informal Sector

To integrate and formalize informal sector:

Rule 11(c) of the SWM Rules 2016 directs that each state/UT must prepare a state/UT policy and solid waste management strategy that acknowledges the

primary role played by the informal sector of waste pickers, collectors, and recycling industry in reducing waste and provide broad guidelines regarding integration of these groups in the waste management system. As per Rule 6(4) of the Plastic Waste management Rules 2016 local body to frame bye-laws incorporating the provisions of these rules. In addition, there are various policies, action plans and reports including the report of the Second National Labour Commission of 2002 that has recognized the role played by the informal sector in waste management and civic hygiene and they have all suggested that governmental authorities will take steps to provide legal recognition, social security, health and safety facilities and access to financial resources and technologies. For Leh and Kargil, a database for the informal sector shall be formulated, and uploaded with the Garbage Free city Initiative. The database shall require formal receipts, issuing identification documents, provide KYC and linkage with Aadhar Card, bank account (if possible), provision of bank accounts and providing them relevant incentives directly to their accounts and bring them in the more formal ideation.

a) Itinerant buyers (or Kabaddiwala)/Scrap Dealers who aggregate the waste collected by the waste pickers and/or function as micro-entrepreneurs who buy reusable and recyclable material such as newspaper, metal, glass, and plastics from households, commercial establishments and other waste generators and then re-sell them to large wholesalers who then either sell to larger aggregators or sell to recyclers.
b) Informal recyclers who either clean, dismantle or further sort waste in more specific categories or use rudimentary technology to transform the collected waste into another product and/or raw material that could be used for producing new products.

Plastic waste shall be sold to only authorized recyclers having valid license, which shall be regulated by Pollution Control Committee of the UT-Ladakh.

4.1.7 Enforcement

The enforcement shall also entail different roles for different authorities:

- As per Rule 12 (1) of the Plastic Waste Management Rules, 2016, the UT Pollution Control Committee shall be the authority for enforcement of the provisions of the action plan. The role shall also include registration, manufacturing of plastic products and multi-layered packaging, processing, and disposal of waste.
- The concerned Secretary-in-charge, or person with similar responsibilities with a different title shall be the authority for enforcement of the provisions of this policy, as well as Plastic Waste Management Rules 2016 and further amendments, relating to waste management by waste generator, use of plastic carry bags, plastic sheets or covers made of such sheets, as well as multi-layered packaging.
- The concerned LSG (Municipal Committees, or Municipal Councils, or Municipal Corporations in the future) shall be the authority for enforcement of the action points specific to waste management and waste generators, use of plastic carry bags, plastic sheets, covers, or likes
- Assistance shall be taken by the District Magistrate and Housing and Urban Development Department and Urban Local Bodies for the enhance of the provisions of these rules

- The producers, importers and brand owners shall work out modalities of waste collection system based on Extended Producers Responsibility and involving H&UDD and/or local body for any assistance required
- No person / agency / consortium etc. shall manufacture carry bags or recycled plastic bags or multi-layered packaging unless they have been approved by the UT Pollution Control Committee. Single Use Plastics shall be completely banned.
- Retailers or street vendors shall not provide commodities in plastic carry bags, multi-layered packaging, or plastic sheets. The violators shall be fined as per the Schedule of fines in Solid Waste Management Rules, 2022 for UT Ladakh, Plastic Waste Management (Second Amendment) Rules, 2022, and Plastic Waste Management Byelaws, 2022 for UT Ladakh.
- An integrated command center shall be established to monitor the status of different urban development measures, which shall also include plastic waste management as part of waste management monitoring
- Human resource, financial resource and qualifications shall be identified for various departments involved to make sure proper resource mobilization is undertaken. If need be, new hires – contract or otherwise shall be conducted for the UT and ULB levels
- A multi-department convergence involving Housing and Urban Development Department, Leh Development Authority, Ladakh Autonomous Hill Development Council, Department of Tourism, Association of Hotels, Law and Order Department, Task force may be formed
- Green volunteers from citizens, civil service organizations. Government may also consider creating a separate cadre for the same.

The detailed roles can be referred to in the Plastic Waste (Management and Handling) Rules, 2011 and their further amendments.

4.2 Practice

These solutions identify the need to incentivize changes or disincentivize status-quo. The strategies are stimuli to make behavioural changes in waste generators (bulk, and otherwise) to support waste prevention. The measures highlight collection measures for proper generation, disposal, and transportation of waste to create the least nuisance option.

4.2.1 Minimizing Generation

To minimize generation:

1. Citizens shall be encouraged to carry their own bags, containers, or any other alternative to plastic and/or carriers to reduce the use of plastic instead of single use plastic carry bags, and other plastic products.

4.2.2 Optimizing Storage and Segregation

To optimize storage reclamation of plastic and segregate at source, the following measures shall be taken up:

1 Upgradation of Transfer stations, secondary transport vehicles and control command center shall be undertaken. Data management integration of plastic data shall be essential

2 For bulk producers, the producers themselves will be responsible for primary collection of the plastic waste, and deposition of the same at a designated point of the site. All hotels and restaurants owners shall ensure segregation of waste at source, facilitate

collection of segregated waste in separate streams, handover recyclable material to either the authorized waste pickers or the authorized recyclers. The bio-degradable waste shall be processed, treated, and disposed of through composting or bio-methanation within the premises as far as possible. The residual waste shall be given to the collectors or agency as directed by the local body.

3 Geo-tagging of waste collection vehicles shall be conducted for all the old and new fleets. The monitoring mechanism shall also explore options for source segregation and segregation otherwise.

4 Recyclable material can be collected at regular intervals as may be convenient to the waste producer and the waste collector, as this waste does not normally decay and need not be collected daily. Hazardous waste shall be collected and treated as per Hazardous Waste and other Wastes (Management and Transboundary Movement) Rules,2016. Bio-medical waste shall be collected, treated as per Bio-medical waste management Rules,2016.

5 Procedure of collection: The Municipal Institutions are divided into wards and each of the wards will be manned with adequate number of sanitary workers with adequate required facilities wheelbarrows or similar vehicle will be provided to each of the sanitary workers. Each of the sanitary workers will be made responsible for 300 and 500 houses (or as decided by the authority) depending on the workload. These workers will go to the houses on pre- determined time to collect the waste.

4.2.3 Storage and Transportation

To optimize transportation and storage of waste, the following measures are suggested:

1. Waste collected through Primary Collection System shall be taken up to processing sites, with necessary vehicles and manpower.

2. Bins shall be installed, as well as regular collection shall be specified for bulk generators as well as critical areas like higher altitude habitations.

3. Cost effective systems shall be designed to ensure that waste shall be transported in a hygienic and scientific way (explain) and shall not pose a serious threat to public health and environment, i.e., the waste:
    a. Shall be out of reach of stray animals
    b. Will not obstruct the traffic or spread on road
    c. Shall be easily accessible in terms of distance for the user
    d. Shall be fully covered and not exposed
    e. Shall be able to old the expected waste generated depending on the size and population of the area
    f. Shall be aesthetically acceptable
    g. And shall be designated in a way to be easy to operate, handle, transfer and transport the same

4. The transportation shall be done depending on the waste location and generation:
    a. Daily at community bins.
    b. Before they start overflowing, if required, twice or thrice a day.
    c. Depending on the characteristic of waste, they will follow different routes, as the disposable site may be different for the different type of

wastes.

5. Solid Waste collection sheds and collection depots need to be identified and installed by MCs.

4.2.4 Recycling

To optimize recycling, Table-3 showcases a gist of what to recycle the different categories of plastic to.

Table 12 Recycling options for different categories of Plastic (Classification of plastics as per CPCB)

Category of Plastics	Name	Properties	Recycled to:
	PETE/PET	PET – Polyethylene Terephthalate used for many bottles application because they are inexpensive, lightweight, and shatter-resistant	Pillow and sleeping bag filings and Mineral/Drinking Water Bottles, Cosmetic Bottles
	HDPE	HDPE – High Density Polyethylene used for in bottles, carry bags, milk pouches, recycle bins, etc.	Tubes, sewer pipes, pallets, boxes, buckets, toys, bottles for shampoos, motor oils, drugs, etc.
	PVC	PVC – Polyvinyl Chloride used for pipes and fittings, Tarpaulins, Medical Apps, etc.	Sewer Pipes, Window Frames, Construction, Flooring, Wallpaper, Bottles, Car Interiors, Medical Products, planks, etc.
	LDPE/LLDPE	LDPE – Low Density Polyethylene (LLDPE stands for Linear LDPE) used in Plastic bags, various containers, bottles, wash bottles, tubing, etc.	LDPE - Garbage cans, paneling furniture, flooring, and bubble wrap LLDPE – Food packaging films
	PP	PP – Polypropylene used in Auto parts, Industrial Fibers, Food Containers, etc.	Pipes, pallets, boxes, furniture, car parts, pots of yoghurt, buckets, butter, margarine, fibers, milk crates, car battery cases, trays etc.
	PS/EPS	PS – Polystyrene (EPS stands for Expanded Polystyrene) is used in food service packaging, disposable cups, tray pitchers, refrigerators, liners, etc. It may also be used as cushioning materials for fresh produce, electronic or appliance industries, etc.	Clothes Hangers, Park Benches, Flowerpots, Toys, spoons, eyeglasses frames, plastic cups, egg trays, packaging and building insulation etc., stationery trays and accessories, picture frames, seed trays etc..
	Others/ Miscellaneous	Others (usually, Mixed Plastic Waste, used in Thermoset Plastics, Multilayer and laminates, Bakelite, Polycarbonate, etc. like hub caps, optical fibers, touch screens)	CDs, Pallets, Floors, Roofs, Furniture, Sheeting, Benches, Shoe soles, etc.
Not defined under classifications by CPCB			
	PUR	Polyurethane – used in Building insulations, pillows, mattresses and insulating foams for fridges	

Recycling is done by the following processes:

a) **Primary Recycling**: Simple and low-cost practice, the process refers to reuse of the products in their original structure. However, the number of cycles the recycling can take place is limited for each material.

b) **Secondary / Mechanical Recycling**: Applicable only for thermoplastic polymers, the plastic is re-melted and reprocessed into end products. This doesn't alter the polymer during the process. The process is undertaken by cutting, shredding, or washing into granulates, flakes or pellets of appropriate quality for manufacturing, and then melted to make the new product by extrusion. Blending is also possible for enhancing the reprocessed material with virgin material to obtain superior results. However, the product's quality is deteriorated on each cycle due to lower molecular weight of the recycled resin, and the heterogeneity of solid waste remains the concern.

c) **Feedstock or Chemical Recycling**: Complementing the mechanical recycling, this process converts polymers to monomers, or partially depolymerized to oligomers through chemical reaction. The resulted monomers can be used for new polymerizations to reproduce original or related polymeric product, and converts the plastic material into smaller molecules, suitable to be used as feedstock material (monomers, oligomers or mixtures of other hydrocarbon compounds).

Table 13 Chemical reactions used for decomposition of polymers into monomers

Hydrolysis	Chemical Depolymerization
Glycolysis	Thermal Cracking
Gasification	Catalytic cracking and reforming
Hydrolysis	Photo degradation
Pyrolysis	Ultrasound degradation
Methanolysis	Degradation in microwave reaction

4.2.5 Plastic Waste Processing and Value Extraction

Various techniques are used for processing of plastic wastes that are undertaken:

1. Plastic waste can be turned into fuel for manufacturing process and equipment design to produce energy. The various mechanical, biological, and calorific systems and technologies can convert, reprocess or break-up waste into new material or energy. Only non-recyclable plastic needs to be converted into energy. This is undertaken by a process called co-processing which uses plastic waste in cement industries, power stations and/or any other combustion plants where the primary fuel is replaced by plastic waste (the waste is also referred to as alternative fuels and raw materials (AFR)). This contributes to more eco-efficient production and may add to plastic credits of the companies.

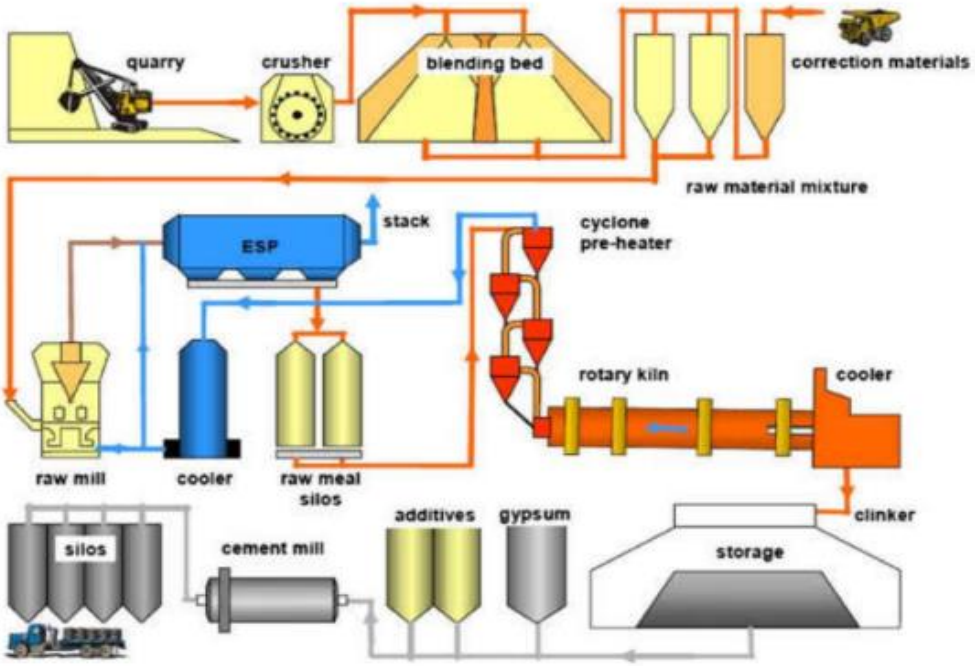


Figure 12 Schematic representation of Co-processing for Cement Plants (Source: Guidelines for Co-processing of Plastic Waste in Cement Kilns by Central Pollution Control Board - https://cpcb.nic.in/uploads/plasticwaste/Co-processing_Guidelines_Final_23.05.17.pdf)

Table 14 Protocol for Co-processing of Plastic Waste at Cement Factory

Sr. #	Item	Description	Action takers
1	Collection of Plastic Waste	Concerned Municipal Authority will create a system for collection of plastic wastes through Public Private Partnership (PPP) mode or any other feasible method	ULB / Gram Panchayats (in respective jurisdiction in urban agglomeration)
2	Segregation & Pre-processing of plastics waste	Collected plastics can be reprocessed/sorted into recyclable and non-recyclable fractions. The Non-recyclable plastics waste will be transported to nearest cement kilns and power plants for co-processing by concerned Municipal Authority in consultation with UT Ladakh Pollution Control Committee (PCC)	ULB / Gram Panchayats (in respective jurisdiction in urban agglomeration)
3	Identification of cement factory	Mapping of cement kilns and power plant for accepting co-processing of	ULB / Gram Panchayats (in

Sr. #	Item	Description	Action takers
		plastic waste in UT Ladakh or neighbouring states (if required. An agreement shall be signed between Municipal Corporations and Cement kilns	respective jurisdiction in urban agglomeration)
4	Modification for feeding plastic waste (PW) in cement kilns	Cement Industry/power plant to set-up storage facility, shredder, conveyor belt, hopper, winch-machine, and double-flap damper as per CPCB Guidelines for Co-processing of Plastic Waste in Cement Kilns	Concerned Cement Industries/Power Plant
5	Setting up of laboratory for plastics waste analysis	Cement industry / power plant shall set-up a lab facility to analyze plastic waste before sending for co-processing. The instrumentation include Thermo-Gravimetric Analyzer, Bomb-Calorimeter and C,H,N&S Analyzer	Concerned Cement Industries/Power Plant
6	Monitoring of emission by cement industry / SPCBs	Cement Industry / power plant shall monitor the emission in respect of routine parameters and hazardous air pollutants (HAPs)	Concerned Cement industry
7	Forwarding progress report to CPCB	Quarterly progress report of Co-processing of plastic waste shall be forwarded to CPCB	UT Ladakh PCC and Cement industries/Power plant

2. Compostable plastics may also be considered. They are, as defined under PWM rules, are "plastic that undergoes degradation by biological processes during composting to yield CO2, water, inorganic compounds and biomass saturate consistent with other known compostable materials, excluding conventional Petro-based plastics, and does not leave visible, distinguishable or toxic residue." They are also covered under EPR obligations and the producer/brands of such compostable plastic products need to ensure that these materials are disposed and collected and sent to the correct processing facilities. This shall entail:

    a) Setting up / supporting infrastructure for separate collection and procession of compostable plastic
    b) Setting up / support industrialized composting facilities in the ULB where such material can be composted

3. MRF Facility at Kargil shall be undertaken for plastic waste collection and sent to respective processors.

4. ULBs may consider plastic in the construction of roads and building materials.

    - Bituminous mix with plastic wastes shall be the default mode within 50

km periphery of urban area having population more than 5,00,000.

- Any relaxation on ground of non-availability of waste plastic, cost etc. shall involve approval of the ministry.

- All the agencies responsible for preparation of project reports/ estimates for the national highways and centrally sponsored works are expected to analyze and clearly bring out reasons for inclusion or otherwise of provision of use of waste plastic in wearing cost of disposal.

- There are two processes namely dry process and wet process for manufacturing bituminous mixes using plastic waste. In the dry process, processed (cleaned and dried) plastic waste is added after shredding in hot aggregates whereas in the wet process, processed waste plastic in the form of powder is added in the hot bitumen. As the wet process is not as cost-effective as compared to the dry process and requires a lot of capital investment, it is preferable to use the dry process in the construction of roads.

4.3 Awareness generation

The primary objective to create public awareness is to encourage behavioural change. Creating awareness among public, as well as business community is pivotal to changing behaviour of plastic use, and subsequently generating waste. Sharing practical information and guiding tools about how individuals or organizations can prevent and reduce waste in their daily lives is a critical first step. Furthermore, creating awareness in citizens also leads to gradual reduction in usage patterns as well as generation of new ideas and alternatives, which further leads to a new vision for the city as such.
Some measures that will be considered are:

1. Having a comprehensive targeted IEC/BCC strategy and plan in place. This would target at optimizing outreach using various mass communication as well as inter-personal communication mediums.

2. Prominent display of messages and signages and announcements to guide users to use the appropriate bins for disposal of plastic waste items. This can be supplemented by a series of IEC (Information, Education & Communication) materials, which may be produced locally, or at UT level, by the government, and/or by Civil Society Organizations in collaboration with the citizens. Radio Jingles to discourage plastic usage can be aired on local FM. These materials may be used to convey the following and similar messages:

   - "There is nothing called waste. Everything is reusable. Help us re-use everything."
   - "A small item that you throw today becomes a larger problem for all of us tomorrow."

3. Sensitization workshops, lectures, and seminars shall be conducted to educate and create awareness amongst children at schools, colleges, and other educational institutions.
4. Supplementary modes of dissemination may include posters (including roadside poster painting), radio jingles, strip advertising on major advertisement sites, shorts prior to exhibition of cinematic or theatrical performances, ticker advertisements on

local cable television, etc. may be used to create further awareness. Door-to-Door campaigns, Cultural events, Fairs/carnivals, competitions, and awareness campaigns shall be beneficial in showcasing/promoting alternative sources of plastics. Prominent celebrities and brand ambassadors can also be engaged to promote use of alternative plastics instead of single use plastics.

5. Social Media highlights and posts need to encourage plastic ban and alternative uses of plastic.

6. Agencies need to be empaneled to make films and awareness videos. PR agency can be hired for more broadcasting, who may work with Information department of the UT.

7. Talks and quiz competitions need to be aired on local TV. Schools, and youths may be encouraged to participate. Schools and Department of Education may also form clubs to encourage such initiatives.

8. Creating awareness among citizens and primary waste collectors to handle compostable plastic as a separate category and dealing with them in the proper way.

9. To continuously monitor the satisfaction level of the citizens and other stakeholders via surveys, social network, and registered complaints. Online evaluations shall be conducted with the key stakeholders periodically, as well as after achieving concurrent milestones.

10. Competitions shall be arranged to provide small and medium scale industries and commerce to gain recognition or subsidies to reduce production, use, purchase, or sale of single use plastic.

11. Businesses shall be encouraged to stop using disposable plastic by providing tax benefits, rent relaxations, etc.

12. Events like Housing and Urban Development Conclave, training workshops and annual meetings/conference shall be conducted and focused on plastic waste management.

13. Awareness campaigns like Twin Bin System, Waste out of Wealth, Campaign against littering, plastic ban campaign in meat shops, Black Bag Campaign, etc. shall be conducted to raise awareness and reducing the generation of plastic waste.

14. Tourists need to be sensitized about reusing plastic bottles or bring their own flasks by proper signages, website reports and news articles.

"The Action Plan deals with identifying potential measures for Governance, Practice and Awareness. This includes a comprehensive ideation on limiting plastic waste, building capacity for waste collection and processing, extracting value from plastic and innovate new age solutions for a

2.18 5. Plan of Action*

Sr. No.	Strategic areas	Action Points	Short-term (by next 6 months to 01 year)	Medium term (by next 01 to 03 years)	Long term (by next 03 to 05 years)
1	Governance				
	Regulations governing limit of plastic waste	Ban of Single Use Plastic Notification (as per Plastic Waste (Amendment) Rules 2021), and any and all relevant notifications by Central Government, and UT-Ladakh			
		SWM Bye laws 2022			
		Identification of stockists, retailers, etc. who are using SUP as per CPCB Action Plan			
		Phase-out program			
	Capacity building	Allocation of enforcement to authorities			
		Formation of Task force			
		Formalizing Informal Sector			
		Provision of tools to workers			
	Formulation of Financial provisions	Preferential Buy-back policies			
		EPR Modulation for Bulk Waste Generators			
		Green Taxation			
		Plastic Credits			
		Incentivizing Research			
	Tourism	BYOF/Reuse regulations			
2	Practice				
	Source Segregation	Suitable vehicles for segregated collection and transportation			
		Integration of Plastic Waste Collection in ICCC			
		Setting up MRF Facility and Monitoring			
		Converting Plastic to AFR (alternative fuel and raw material)			
	Monitoring	Geo-Tagging of vehicles			
		Recycling			
	Innovative Technology	Replacing plastic with substitute materials			
		Identifying recycling agencies			
3	Awareness and Behaviour change				
	IEC/BCC Strategy/Plan	Signages, Hoardings, Posters for awareness creation			

		Integration of IEC with UT/ULB website			
	Awareness campaigns	Schools, Universities competitions			
		Sensitization workshops/seminars			
		Sensitization of tourists about using plastic in the UT			
		Radio Jingles/TV Advertisements/Social Network Marketing			
	UT level sensitization and workshop	Mass awareness by HUD Conclave			

*The Plan of Action shall be substantiated and shall be in-line with CPCB's Action Plan for phasing out Single Use Plastic, and any other plastic waste management action plans as deemed necessary by CPCB.

2.19 Annexure-I

I/1521/2021

F.No. LA/GAD(UT-Committee)UTL/2021(13)
THE ADMINISTRATION OF UNION TERRITORY OF LADAKH
GENERAL ADMINISTRATION DEPARTMENT
E-mail : gad.utladakh@ladakh.gov.in

UT Secretariat, Ladakh
Dated:-13.09.2021

Subject: Constitution of UT Level Advisory Committee for implementation of the Plastic Waste (Management and Handling) Rules, 2016 as amended from time to time.

Order No:- 158-LA(GAD) of 2021
Dated:-13.09. 2021

In pursuance of Rule-16 of Plastic Waste (Management & Handling) Rules, 2016 as amended from time to time and notified by the Ministry of Environment, Forest and Climate Change, Government of India vide Notification No: G.S.R.320(E) dated- 18th March, 2016, sanction is hereby accorded to the constitution of UT Level Advisory Committee, comprising the following to oversee the effective implementation of Plastic Waste Management Rules, 2016 (AA) in Union Territory of Ladakh:-

1.	Administrative Secretary, Housing and Urban Development Department	Chairman
2.	Administrative Secretary, Rural Development Department	Member
3.	Administrative Secretary, Tourism Department	Member
4.	Member Secretary, Pollution Control Committee	Member
5.	Deputy Commissioner, Leh.	Member
6.	Deputy Commissioner, Kargil.	Member
7.	Additional Commissioner UT GST(Director, A&T, Ladakh)	Member
8.	Director, Urban Local Bodies, Ladakh.	Convener/ Member Secretary
9.	Director Rural Development Department.	Member
10.	Executive Officers, Municipal Committee Leh and Kargil Districts.	Members
11.	Mr. Tsewang Dorjey, President, PAGIR (NGO involved in waste management)	Member
12.	Ms. Konchok Dolma, Assistant Professor, from the field of academic institution.	Member
13.	Mr. Rohit Chandra Joshi, Expert from Plastic Association.	Member
14.	Mr. Thinles Dorjey, Expert from field of Industry.	Member
15.	Ms. Rinchen Dolker, Ward Member- Murtse-8.	Member
16.	Mr. Tenzin Motup Tahang- LEDeG (NGO)	Member
17.	One expert from Local Body to be nominated by the Chairman (Administrative Secretary Housing and Urban Development Department).	Member

Terms of reference of the UT Level Advisory Committee:-

i. To oversee the implementation of the Plastic Waste (Management and Handling) Rules 2016 as amended from time to time, in the Union Territory of Ladakh and to advice on strengthening policy, regulatory and institutional mechanisms/ structures for the effective implementation of rules.

Approved 13.09.2021

I/1521/2021

ii. The Advisory Committee shall meet at least once in six months and review all matters related to implementation and enforcement of the provisions of these rules in Union Territory of Ladakh.

iii. The Housing and Urban Development Department may co-opt representatives from the other governmental and non-government organizations having expertise in the field of Plastic Waste (Management and Handling) as per need.

By order of Lt. Governor, Ladakh.

Sd/-
(Ajeet Kumar Sahu)IAS
Commissioner/Secretary
General Administration Department

Copy as Above.

Copy also to the:

1. Principal Secretary, Forest, Ecology and Environment Department, Ladakh. The U.O. file is returned herewith.
2. All Administrative Secretaries, UT Ladakh.
3. Deputy Commissioner/ CEO, LAHDCs, Leh and Kargil.
4. District Informatics Officer, NIC Ladakh for uploading on UT website.
5. OSD to Hon'ble Lt. Governor Ladakh for information of Hon'ble Lt. Governor.
6. Private Secretary to Advisor to Hon'ble Lt. Governor for information of Advisor to Hon'ble Lt. Governor.
7. E- office/ Order file.

13.09.2021

(Sonam Chhosdon)
Under Secretary
General Administration Department

2.20 Annexure-II

Ministry of Environment, Forest and Climate Change

Government notifies the Plastic Waste Management Amendment Rules, 2021, prohibiting identified single use plastic items by 2022.

Thickness of plastic carry bags increased from 50 to 75 microns from 30th September, 2021 and to 120 microns with effect from the 31st December, 2022.

Guidelines for Extended Producer Responsibility given legal force.

Posted On: 13 AUG 2021 3:38PM by PIB Delhi

In line with the clarion call given by Prime Minister Shri Narendra Modi to phase out single use plastic by 2022, keeping in view the adverse impacts of littered plastic on both terrestrial and aquatic ecosystems, the Ministry of Environment, Forest and Climate Change, Government of India, has notified the Plastic Waste Management Amendment Rules, 2021, which prohibits identified single use plastic items which have low utility and high littering potential by 2022.

Pollution due to single use plastic items has become an important environmental challenge confronting all countries. India is committed to take action for mitigation of pollution caused by littered Single Use Plastics. In the 4th United Nations Environment Assembly held in 2019, India had piloted a resolution on addressing single-use plastic products pollution, recognizing the urgent need for the global community to focus on this very important issue. The adoption of this resolution at UNEA 4 was a significant step.

The manufacture, import, stocking, distribution, sale and use of following single-use plastic, including polystyrene and expanded polystyrene, commodities shall be prohibited with effect from the 1st July, 2022:-

a. ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol] for decoration;

b. plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.

In order to stop littering due to light weight plastic carry bags, with effect from 30th September, 2021, the thickness of plastic carry bags has been increased from fifty microns to seventy five microns and to one hundred and twenty microns with effect from the 31st December, 2022. This will also allow reuse of plastic carry due to increase in thickness.

The plastic packaging waste, which is not covered under the phase out of identified single use plastic items, shall be collected and managed in an environmentally sustainable way through the Extended Producer Responsibility of the Producer, importer and Brand owner (PIBO), as per Plastic Waste Management Rules, 2016. For effective implementation of Extended Producer Responsibility the Guidelines for Extended Producer Responsibility being brought out have been given legal force through Plastic Waste Management Amendment Rules, 2021.

The waste management infrastructure in the States/UTs is being strengthened through the Swachh Bharat Mission. The following steps have also been taken to strengthen implementation of Plastic Waste Management Rules, 2016 and also to reduce the use of identified single use plastic items:(i) the States/UTs have been requested to constitute a Special Task Force for elimination of single use plastics and effective implementation of Plastic Waste Management Rules, 2016. A National Level Taskforce has also been constituted by the Ministry for taking coordinated efforts to eliminate identified single use plastic items and effective implementation of Plastic Waste Management Rules, 2016.

The State /UT Governments and concerned Central Ministries/Departments have also been requested to develop a comprehensive action plan for elimination of single use plastics and effective implementation of Plastic Waste Management Rules, 2016, and its implementation in a time bound manner. Directions under Section 5 of Environment (Protection) Act, 1986, have been issued to all States/Union Territories inter alia for setting up for institutional mechanism for strengthening enforcement of Plastic Waste Management (PWM) Rules, 2016.

The Government has also been taking measures for awareness generation towards elimination of single use plastics and effective implementation of Plastic Waste Management Rules, 2016. A two month long Awareness Campaign of Single Use Plastic 2021 has been organized. The Ministry has also organized pan India essay writing competition on the theme for spreading awareness amongst school students in the country.

To encourage innovation in development of alternatives to identified single use plastic items and digital solutions to plastic waste management, the India Plastic Challenge – Hackathon 2021, has been organized for students of Higher Educational Institutions and startups recognized under Startup India Initiative.

Gazette Notification

***

VRRK/GK

2.21 Annexure-III

Standard Guidelines for Single-Use Plastic

Introduction

Plastic is an ubiquitous material. It is lightweight, hygienic and resistant. It can be moulded into different shapes and used in a wide range of applications. Central Pollution Control Board (CPCB) conducted a study in 60 major cities of India (2012), wherein it has been reported that 4059 Ton of Plastic Waste was generated each day from these cities. The fraction of plastic waste in total Municipal Solid Waste (MSW) ranges from 3.10% (Chandigarh) to 12.47% (Surat). Average plastic waste generation is around 6.92% of MSW. With extrapolation of per capita plastic waste generation, it is estimated that 9.46 million tons per annum of plastic waste is generated in India, which is approximately 25,940 Ton/day.

The Ministry of Environment, Forest and Climate Change, in order to tackle the menace of plastic waste had notified, the Plastic Waste Management Rules, 2016 (as amended) in March 2016. The Rules make source segregation of various types of waste mandatory. The ambition is to follow a waste-to-wealth pathway via recovery, reuse and recycling. The Rules also introduce Extended Producer Responsibility, as an environment policy instrument, and assign physical, financial and environmental responsibilities to producers, brand owners and importers of plastic. Under the rubric of the Extended Producer Responsibility, producers/ brand owners need to work with all stakeholders including local bodies, informal sector etc.

India was the global host of 2018 'World Environment Day' which took place on June 5, 2018. With "Beat Plastic Pollution" being the theme for that year's edition, the world came together to minimize plastic consumption and mitigate its impact on environment. During this event, Hon'ble Prime Minister had announced India's pledge to phase-out all Single-Use Plastic by 2022.

Apart from the regulations existing at the Central level, many State/UT Governments through their own notifications has imposed partial or full ban on use of plastic carry bags/single use plastic in their states.

24(of total 29) States and 6 (of total 7) UTs have issued notifications/ orders introducing regulations pertaining to complete ban on plastic carry bags and/or other single-use plastic items. In addition, some States/UTs have introduced partial bans on carry bags or specific single-use items supplementing Plastic Waste Management Rules (PWMR), 2016 in some ways.

Single-Use Plastic

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

Over the years, the amount of plastic entering the oceans and seas have increased. Plastic Marine litter is harmful for the marine ecosystem, biodiversity and potentially human health. Widespread concern on the issue has necessitated the need for a strategic approach to management of plastic waste. The Single-use Plastic items represent majority of items found in plastic marine litter.

Under the Plastic Waste Management Rules, 2016 plastic carry bags (virgin or recycled) with thickness less than 50 microns and plastic sheet or like, which is not an integral part of multi-layered packaging and cover made of plastic sheet used for packaging, wrapping commodities, with thickness less than 50 microns are banned.

State Governments have introduced regulations for management of plastic waste (or full/ partial ban on plastic carry bags) by two ways:

i. Introducing legislation on waste management: some States have introduced specific legislation on waste management. Through such legislation, they have introduced rules on plastic carry bags.

   The States which have introduced legislation are:

   i. Himachal Pradesh: H.P. Non-Biodegradable Garbage (Control) Act, 1995;

   ii. Madhya Pradesh: Madhya Pradesh Jaiv Anaashya Apashishta (Niyantran) Adhiniyam, 2004;

   iii. Maharashtra: Maharashtra Non-Biodegradable Garbage (Control) Act, 2006;

   iv. Jammu & Kashmir: Jammu and Kashmir State Non-Biodegradable Material (Management Handling and Disposal) Act, 2007

   v. Punjab: Punjab Plastic Carry Bags (Manufacture, Usage and Disposal) Control Act, 2005

ii. States have power under the Environment (Protection) Act, 1986 under Section 5 to issue directions: Some of the States which have issued directions under the same are: Haryana, Uttaranchal, Delhi, Rajasthan, U.P., Karnataka, Chhattisgarh, Sikkim, Arunachal Pradesh, Tripura.

Action Items

The following sections map different set of actions taken by the State/ Urban Governments, public sector entities aimed at minimizing production and usage of single-use plastics.

Waste management system improvements

Prohibition on plastic carry bags and single-use plastics can effectively counter some of the challenges. However, better waste management systems, can achieve long-term impacts and address the overall problem of plastics in the environment.

i. States/UTs may invest heavily in improving source segregation of waste. Waste collection and transportation systems should be standardized, and best practices should be inculcated.

ii. Manual on Municipal Solid Waste Management — 2016, as prepared by the Ministry of Housing and Urban Affairs (MoH&UA), which provides a management framework for "Integrated Solid Waste Management" as an approach and provide a framework for ULBs to prepare a Municipal Solid Waste Management Plan in 7 simple steps, is the primary implementation source in this regard.

ii. States/UTs and ULBs may focus on improving last mile delivery of collection and transportation services. The focus should also be placed on improving collection and transportation infrastructure and ensuring segregated waste is collected.

iii. The States/ UTs shall endeavour to promote and encourage identification and use of plastic alternatives products.

Legal options for phasing out of Single-Use Plastic

State/ UT administrations intending to introduce a prohibitive action on single-use plastic products may identify a clear list of products that need to be targeted through this measure so that there is no ambiguity. The products may include:

(a) All plastic carry bags, with or without handles, irrespective of thickness and size;

(b) Plastic cutlery including plates, plastic cups/glass, straws, stirrers etc.; and

(c) Cutlery and other decorative made of Styrofoam (Thermocol).

Promotion of eco-friendly alternatives

State/UT Governments can play a key role in promoting eco-friendly alternatives in order to phase out single-use plastics progressively. Projects which support upscaling or recycling of single-use plastic items and promote small scale or micro enterprises, should be encouraged. The Ministry of Environment, Forest and Climate Change, through a central sector scheme titled 'Creation of Management Structure for Hazardous Substances' provides financial assistance for innovative technologies and novel treatment options for different waste streams.

Social Awareness and public education

i. Awareness/ Sensitization campaigns should be organized throughout the State/UT through TV/ Radio etc. to discourage the use of single-use plastic.

ii. All events organized by or sponsored by the Govt. shall be single-use plastic free.

iii. Governments should try to invite eminent public personalities to serve as brand ambassadors or in any other capacity in the campaign to discourage the use of single-use plastic.

iv. Attention should be focussed on creating awareness/ sensitization in hotspots of plastic usage including tourist spots, religious spots, beaches, pilgrimage sites, schools colleges etc.

v. Particular attention should also be focussed on students and young adults to inculcate a behavioural change in plastic usage. Changes in school curriculum should be introduced to discourage use of single-use plastics, promote the use of plastic alternate materials and promote source segregation.

Action by Government offices

State/UT Governments and Government employees should serve as an ideal in the effort to combat single-use plastic. In this regard, following actions should be undertaken:

i. All Govt. offices/ sub-ordinate offices etc., all other offices under the administrative control shall be declared single-use plastic free by banning single-use plastic items/ disposable plastic items including:

    i. All types of Plastic carry bags; and

    ii. Plastic/ thermocol (polystyrene) disposable cutlery including cups/glass, bowls, glasses, forks, spoons, containers, straws etc. used for serving eatables/drinks.

ii. Further, all Govt. offices/ sub-ordinate offices etc. and all other offices under the administrative control shall discouraged to use plastic products including:

    i. Artificial flowers, banners, flags, flower pots;

    ii. PET plastic water bottles;

    iii. Plastic folders, trays etc. and

    iv. Any other plastic material for which an alternative exists.

iii. All Government offices/ sub-ordinate offices etc. shall promote and practice source segregation Public sector enterprises should be encouraged to promote such phase-out of single-use plastics

iv. Private sector should also be encouraged to give up single-use plastic voluntarily.

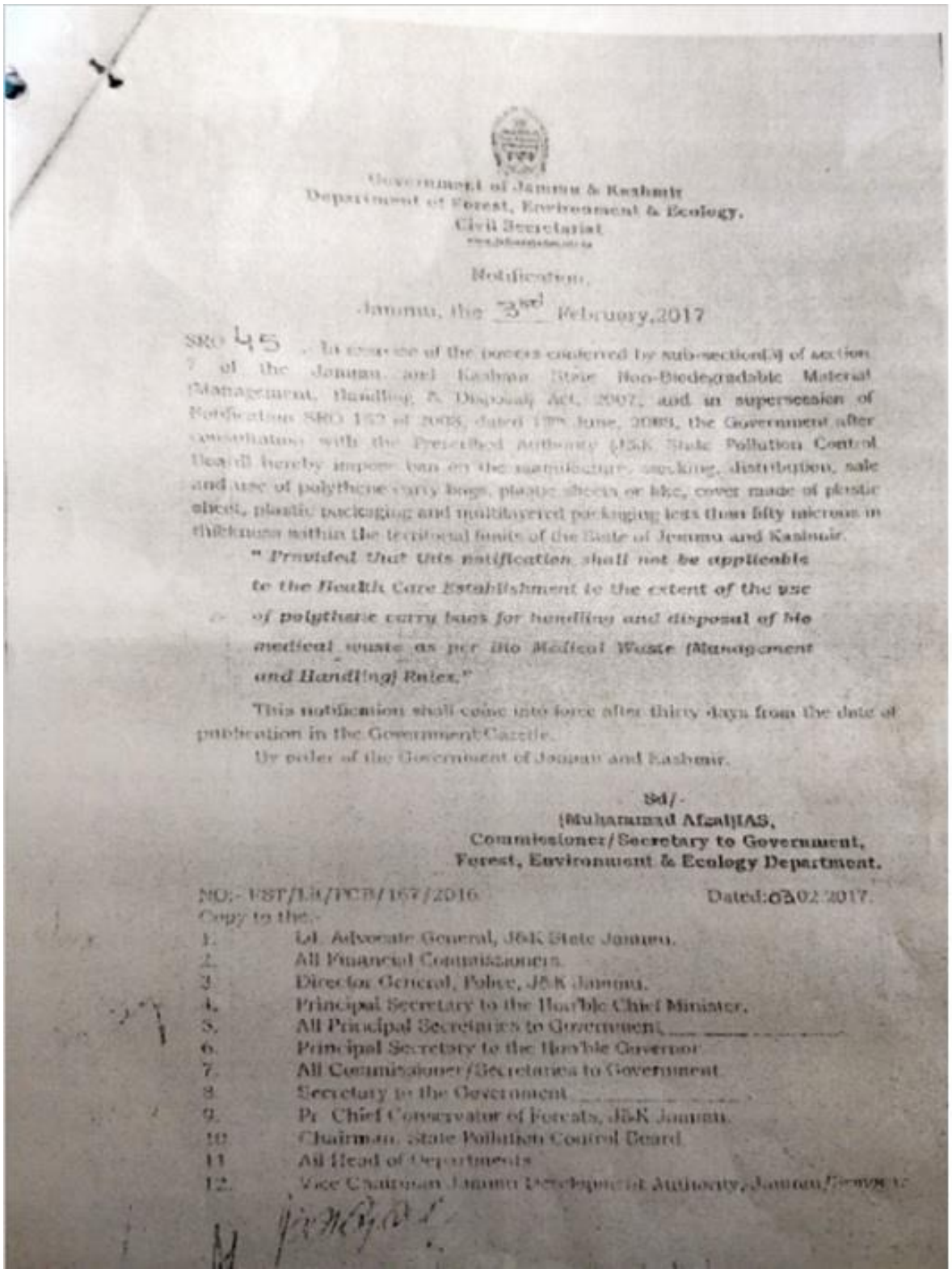
Extended Producer Responsibility

The Ministry of Environment, Forest and Climate Change, is currently formulating a national framework for implementing Extended Producer Responsibility (EPR) under Rule 9 of Plastic Waste Management Rules, 2016. Under the proposed framework, modalities will be fixed for producers/ brand owners and importers of plastic products for implementing the EPR framework, working in consonance with State Urban Development Departments/ Urban Local Bodies/ Central Pollution Control Board/ State Pollution Control Boards/ Committees and other stakeholders involved in the plastic value chain.

Certain single-use plastic products including PET/PETE bottles used for packaging beverages including water, may not require prohibitive action and will come under the ambit of recycling/processing channels under EPR.

With reference to Multi-layered Packaging, it is observed that replacement technologies are still not available to the manufacturers of products which use such packaging. Hence it may not be suitable to phase-out or prohibit the use of MLPs at this stage. MLP which is non-recyclable or non-energy recoverable and with no alternate use are required to be phased out (Plastic Waste Management (Amendment) Rules, 2018).

2.22 Annexure-IV



Government of Jammu & Kashmir
Department of Forest, Environment & Ecology.
Civil Secretariat

Notification,

Jammu, the 3rd February,2017

SRO 45 .- In exercise of the powers conferred by sub-section(3) of section 7 of the Jammu and Kashmir State Non-Biodegradable Material (Management, Handling & Disposal) Act, 2007, and in supersession of Notification SRO 152 of 2008, dated 17th June, 2008, the Government after consultation with the Prescribed Authority (J&K State Pollution Control Board) hereby impose ban on the manufacture, stocking, distribution, sale and use of polythene carry bags, plastic sheets or like, cover made of plastic sheet, plastic packaging and multilayered packaging less than fifty microns in thickness within the territorial limits of the State of Jammu and Kashmir.

" Provided that this notification shall not be applicable to the Health Care Establishment to the extent of the use of polythene carry bags for handling and disposal of bio medical waste as per Bio Medical Waste (Management and Handling) Rules."

This notification shall come into force after thirty days from the date of publication in the Government Gazette.

By order of the Government of Jammu and Kashmir.

Sd/-
(Muhammad Afzal)IAS,
Commissioner/Secretary to Government,
Forest, Environment & Ecology Department.

NO:- FST/Estt/FCB/167/2016 Dated:03.02.2017.

Copy to the:-

1. Ld. Advocate General, J&K State Jammu.
2. All Financial Commissioners.
3. Director General, Police, J&K Jammu.
4. Principal Secretary to the Hon'ble Chief Minister.
5. All Principal Secretaries to Government.
6. Principal Secretary to the Hon'ble Governor.
7. All Commissioner/Secretaries to Government.
8. Secretary to the Government.
9. Pr. Chief Conservator of Forests, J&K Jammu.
10. Chairman, State Pollution Control Board.
11. All Head of Departments.
12. Vice Chairman, Jammu Development Authority, Jammu.

2.23 Annexure-V

F.No. LA/GAD(UT-Committee)UTL/2021(13)
THE ADMINISTRATION OF UNION TERRITORY OF LADAKH
GENERAL ADMINISTRATION DEPARTMENT
E-mail Id: gadutladakh@gmail.com

UT Secretariat, Ladakh
Dated:-07.05.2021

Subject: Constitution of UT Level Special Task Force (STF) for taking up measures to eliminate single use plastic and also for implementation of Plastic Waste Management Rules, 2016.

Order No:- 75 -LA(GAD) of 2021
Dated:- 07.05. 2021

Sanction is hereby accorded to the Constitution of Special Task Force (STF) for taking up measures to eliminate Single Use Plastic (SUP) and to prepare a comprehensive plan with timelines in mission mode and also for implementation of Plastic Waste Management Rule (PWMR) 2016.

The STF is hereby constituted comprising of following members:

1.	Advisor to HLG, UT Ladakh	Chairman
2.	Administrative Secretary, Forest, Ecology and Environment, Department	Member
3.	Administrative Secretary, Housing &Urban Development Department.	Member
4.	Administrative Secretary, Rural Development & Panchayati Raj	Member
5.	Administrative Secretary, Industries & Commerce Department.	Member
6.	Commissioner/ Secretary School Education Department.	Member
7.	Administrative Secretary, Higher Education Department .	Member
8.	Administrative Secretary, Science & Technology Department.	Member
9.	Administrative Secretary, Youth Service & Sports Department.	Member
10.	Administrative Secretary, Information Department	Member
11.	Member Secretary, Pollution Control Committee (PCC)	Member Secretary
12.	Director, Rural Development.	Member
13.	Director, Urban Local Bodies.	Member

The term of reference of the said task force are as under:-

i. Prepare a comprehensive action plan for implementation of PWMR 2016 and phasing out of SUPs, with identified activities and timelines and synergizing efforts and resources of various Departments/ Agencies at UT, District and City level.

ii. Assess plastic waste generated in UT with respect to collection, recycling and end of life disposal and identify gaps in plastic waste management

Under Secretary (GAD) (Sonam) Date 7th May

(Reduce, Reuse and Recycle)- policy, implementation, enforcement, infrastructure, etc.

iii. Strengthen policy, regulatory, institutional mechanisms/ structures for the implementation of Plastic Waste Management Rules (PWMR), 2016 and phasing out of Single use plastic in the UT, design appropriate management strategies and allow for allocation of financial resources for Plastic Waste Management (PWM) including leveraging of funds from Swachh Bharat Mission.

iv. Take measures for effective enforcement of (i) Plastic Waste Management Rules, 2016, as amended, and (ii) UT specific bans imposed on identified Single Use Plastic items.

v. Develop policies for supporting the adoption of alternatives to identified Single Use Plastic items prohibited under PWMR, 2016 as amended.

vi. Take measures to strengthen ULB/GPs for segregation, collection, storage, transportation, processing, and disposal of plastic waste.

vii. Take measures for effective monitoring of implementation of PWM Rules, 2016, as amended.

viii. Prepare a detailed road map for activities to build awareness and outreach among public on Plastic Waste Management and reduction on use of SUP items.

ix. Develop strategy for building a strong public movement for mitigation of plastic pollution by involving educational instructional (Schools, colleges, universities), NCC, NSS, Scouts, Youth Clubs, Eco Clubs, opinion makers and voluntary organization, with detailed action plan in this regard.

By order of Lt. Governor, Ladakh.

Sd/-
(Ajeet Kumar Sahu)IAS
Commissioner/Secretary
General Administration Department

Copy as above

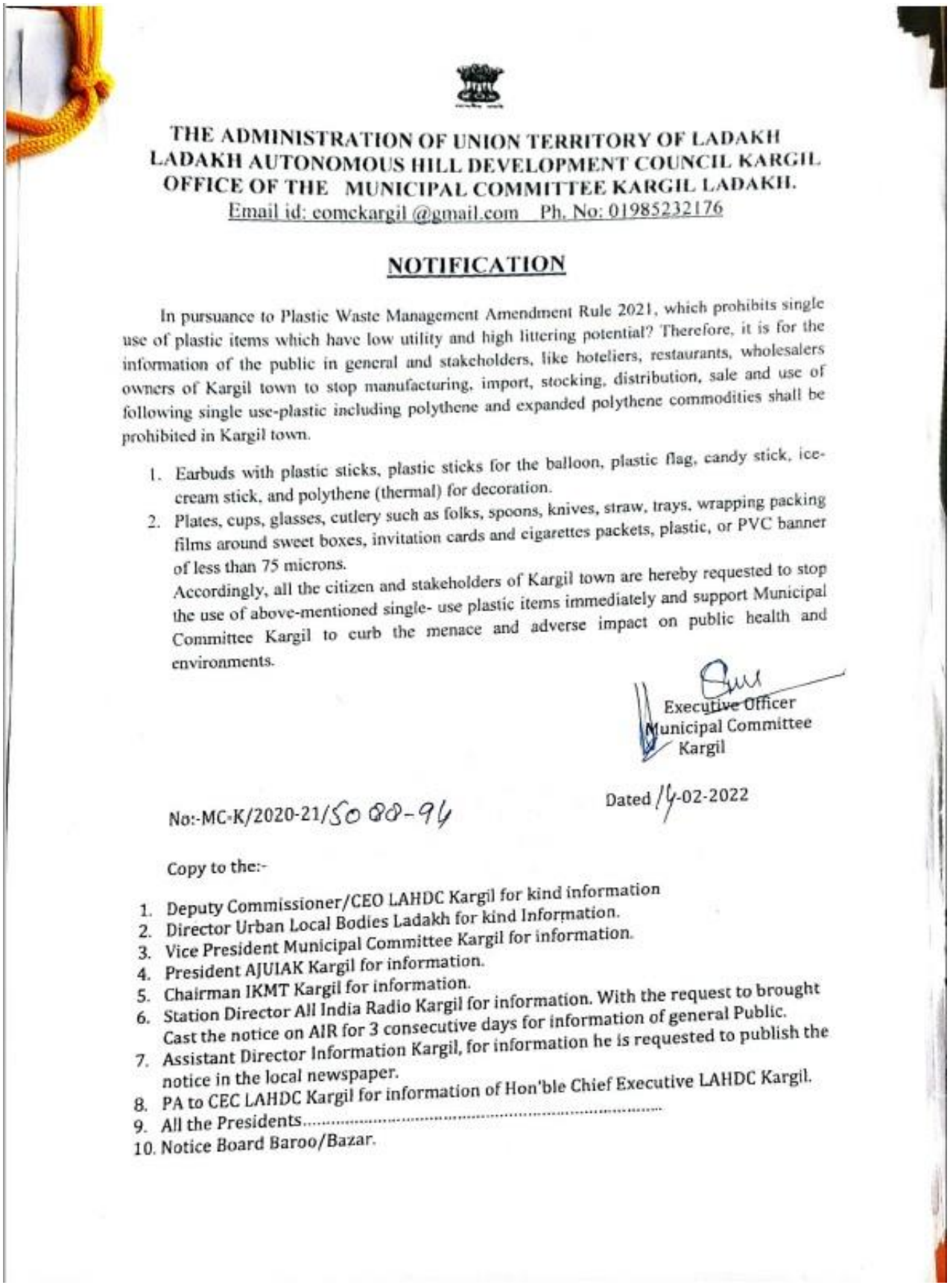
Copy also to the:

1. All Administrative Secretaries, UT Ladakh.
2. Deputy Commissioner/CEO, LAHDC, Leh/Kargil.
3. District Informatics Officer, NIC Ladakh for uploading on UT Ladakh website.
4. Private Secretary to Advisor to Hon'ble Lt. Governor for information of Advisor to Hon'ble Lt. Governor, Ladakh.
5. Office/ Order file.

07.05.2021

(Sonam Chhosdon)
Under Secretary
General Administration Department

2.24 Annexure-VI



THE ADMINISTRATION OF UNION TERRITORY OF LADAKH
LADAKH AUTONOMOUS HILL DEVELOPMENT COUNCIL KARGIL
OFFICE OF THE MUNICIPAL COMMITTEE KARGIL LADAKH.
Email id: comckargil @gmail.com Ph. No: 01985232176

NOTIFICATION

In pursuance to Plastic Waste Management Amendment Rule 2021, which prohibits single use of plastic items which have low utility and high littering potential? Therefore, it is for the information of the public in general and stakeholders, like hoteliers, restaurants, wholesalers owners of Kargil town to stop manufacturing, import, stocking, distribution, sale and use of following single use-plastic including polythene and expanded polythene commodities shall be prohibited in Kargil town.

1. Earbuds with plastic sticks, plastic sticks for the balloon, plastic flag, candy stick, ice-cream stick, and polythene (thermal) for decoration.
2. Plates, cups, glasses, cutlery such as folks, spoons, knives, straw, trays, wrapping packing films around sweet boxes, invitation cards and cigarettes packets, plastic, or PVC banner of less than 75 microns.

Accordingly, all the citizen and stakeholders of Kargil town are hereby requested to stop the use of above-mentioned single- use plastic items immediately and support Municipal Committee Kargil to curb the menace and adverse impact on public health and environments.

Executive Officer
Municipal Committee
Kargil

No:-MC-K/2020-21/80 88-94 Dated 14-02-2022

Copy to the:-

1. Deputy Commissioner/CEO LAHDC Kargil for kind information
2. Director Urban Local Bodies Ladakh for kind Information.
3. Vice President Municipal Committee Kargil for information.
4. President AJUIAK Kargil for information.
5. Chairman IKMT Kargil for information.
6. Station Director All India Radio Kargil for information. With the request to brought Cast the notice on AIR for 3 consecutive days for information of general Public.
7. Assistant Director Information Kargil, for information he is requested to publish the notice in the local newspaper.
8. PA to CEC LAHDC Kargil for information of Hon'ble Chief Executive LAHDC Kargil.
9. All the Presidents.....
10. Notice Board Baroo/Bazar.

2.25 Annexure-VII

THE ADMINISTRATION OF UNION TERRITORY OF LADAKH
LADAKH AUTONOMOUS HILL DEVELOPMENT COUNCIL, LEH
OFFICE OF THE EXECUTIVE OFFICER MUNICIPALCOMMITTEE LEH
Tel. Fax No. 01982-253464E.mail ID: adm.mcleh@gmail.com

PUBLIC NOTICE

In pursuance to Plastic Waste Management Amendment Rule 2021, Which prohibits single use of plastic items which have low utility and high littering potential. Therefore, it is for the information of the public in general and stakeholders, like hoteliers, restaurants, wholesalers owners of Leh town to stop manufacturing, import, stocking, distribution, sale and use of following single use - plastic including polythene and expanded polythene commodities shall be prohibited in Leh town.

1. Earbuds with plastic sticks, plastic sticks for the balloon, plastic flag, candy stick, ice-cream stick, polythene (thermal) for decoration.

2. Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping packing films around sweet boxes, invitation cards and cigarettes packets, plastic, or PVC banner of less than 75 microns.

Accordingly, all the citizens and stakeholders of Leh town are hereby requested to stop the use of above-mentioned single-use plastic items immediately and support Municipal Committee Leh to curb the menace and adverse impact on public health and environments.

Executive Officer
Municipal Committee
Leh

No: - MCL/2021-22/ 512
Dated: 03 -02-2022

Copy to the: -

1. Deputy Commissioner /CEO LAHDC Leh for information.
2. Director Urban Local Bodies Ladakh.
3. Vice President MC Leh for information
4. Nodal Agency, District pollution Control Board Leh (DFO) Leh for info, and n/a.
5. Assistant Director Information Leh for information and wide publicity
6. Station Director AIR for information with request to kindly broadcast the above public notice for three consecutive days from AIR Leh for general information.
7. President Press Club Leh I for information
8. Sanitary Inspector M.C Leh for information and n/a.

2.26 Annexure-VIII

THE ADMINISTRATION OF UNION TERRRITORY OF LADAKH
GENERAL ADMINISTRATION DEPARTMENT
Civil Secretariat, Ladakh

Phone No. 01982 - 257561 (0), Fax No. 257435, E-mail: comsecyutladakh@gmail.com

Subject: **Ban on the use plastic water bottles and other plastic made objects in Government offices and other institutions.**

Order No.40-LA(GAD) of 2020
Dated:23-06-2020

In order to curb the menace and adverse impact on health and environment, due to the use of plastics and its products in Government Offices/ organizations and Educational Institutions, it is hereby ordered that henceforth:-

i. All Government Offices/ Boards/ Corporations/ Autonomous Bodies/Units/Educational Institutions/Universities/ in the Union territory of Ladakh shall dispense with the use of plastic water bottles in their respective offices and make alternate arrangements for safe drinking water that does not generate plastic waste.

ii. Initiatives and steps be taken to ensure total ban on the use of plastic bottles, plastic folders and similar plastic made objects by **the end of July 2020** in all government offices. Alternative eco-friendly measures be implemented and substitutes made of biodegradable materials be used for all purposes.

iii. Only multi-use water bottles/dispensers/containers will be allowed in Government offices and water bottles of alternative materials like Glass, Steel, Aluminum, etc shall be used.

iv. The educational institutions shall also make efforts in propagating the message of zero littering of plastic bottles, effective plastic waste management and behavioral change towards dispensing with the use of plastic made products in the student community.

v. **The DDOs/ Treasury officers shall not entertain/ process bills that reflect expenditure on the use of aforesaid plastic made articles in government offices. Directions in this regard shall also circulated by the Head of the departments to all line departments/ subordinate offices for strict compliance.**

2. The target and the timeline for phased ban shall be as below-

S.No	Target	Timeline
i	100% of plastic Bottles	15th July 2020
ii	100% of Plastic Files, Folder etc.	31st July 2020

3. The aforesaid instructions associated with dispensing the use of plastic/non-biodegradable products aim towards realization of the long-term goal of "Carbon Neutral Ladakh".

4. Therefore all the concerned Deputy Commissioners/Directors and Head of the Departments/ Organizations/ Boards/Units and Educational Institutions in Union territory of Ladakh will take stringent measures ensuring conformity of the above order in letter and spirit.

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23.06.2020

5. The implementation of the aforesaid instructions shall be reviewed by the Administrative Secretary, General Administration Department/Forest, Ecology and Environment Department on 15th July 2020, for assessment of the steps taken and feedback on the constraints in implementation of the same.

This issues with the approval of the competent authority.

-Sd-
(Rigzian Sampheal) IAS
Commissioner/ Secretary
Finance/ General Administration Department

No:LA/GAD(Carbon Neutral)UTL/2020(09) **Dated:- 23. 06. 2020**

Copy to the:-

1. Inspector General of Police , Ladakh .
2. Deputy Commissioner/CEO, LAHDC, Leh/Kargil
3. All Directors/ Head of the Departments, Ladakh.
4. OSD to Hon'ble Lt. Governor, Union Territory of Ladakh for information of Hon'ble LG.
5. OSD to Advisor to Hon'ble Lt. Governor for information of Advisor to Hon'ble LG.
6. OSD to Secretary/ Divisional Commissioner, Ladakh for information of Divisional Commissioner.
7. District Informatics Officer, NIC, Ladakh for uploading on UT website.
8. Private Secretary to Hon'ble Chief Executive Councilors, LAHDC, Leh/Kargil for information of Hon'ble CECs.
9. Assistant Director Information, Leh/ Kargil for dissemination in all mediums of information.
10. OSD to Commissioner/Secretary, GAD for information of Commissioner/ Secretary .
11. Order File/ Office File

23.06.2020
(Sonam Chosdon)
Under Secretary
Finance/ General Administration Department
Dated: 23-06-2020

2.27 Annexure-IX

F.No. LA/GAD(UT-Committee)UTL/2021(13)
THE ADMINISTRATION OF UNION TERRITORY OF LADAKH
GENERAL ADMINISTRATION DEPARTMENT
E-mail Id: gadutladakh@gmail.com

UT Secretariat, Ladakh
Dated:-07.05.2021

Subject: Constitution of District Level Task Force (DLTF) for taking up measures to eliminate single use plastic and also for implementation of Plastic Waste Management Rules, 2016.

Order No:- 76 -LA(GAD) of 2021
Dated:-07 .05. 2021

Sanction is hereby accorded to the Constitution of District Level Task Force (DLTF) for taking up measures to eliminate Single Use Plastic (SUP) and to prepare a comprehensive plan with timelines in mission mode and also for implementation of Plastic Waste Management Rules (PWMR) 2016.

The DLTF is hereby constituted comprising of following members in both the districts:-

1.	District Magistrate.	Chairman
2.	Assistant Commissioner Development.	Member
3.	District Panchayat Officer.	Member
4.	General Manager Industries.	Member
5.	Chief Education Officer.	Member
6.	District Officer Sports and Youth Affairs.	Member
7.	Assistant Director Information.	Member
8.	Executive Officer, Municipal Committee.	Member
9.	District Officer/ Nodal Officer, Pollution Control Committee (PCC).	Member Secretary

The term of reference of the said task force are as under:-

i. Prepare a comprehensive action plan for implementation of PWMR 2016 and phasing out of SUPs, with identified activities and timelines and synergizing efforts and resources of various Departments/ Agencies at State, District and City level.

ii. Assess plastic waste generated in the UT with respect to collection, recycling and end of life disposal and identify gaps in plastic waste management (Reduce, Reuse and Recycle)- policy, implementation, enforcement, infrastructure, etc.

iii. Strengthen policy, regulatory, institutional mechanisms/ structures for the implementation of Plastic Waste Management Rules, 2016 and phasing out of Single use plastic in the UT, design appropriate management strategies and allow for allocation of financial resources for Plastic Waste Management (PWM) including leveraging of funds from Swach Bharat Mission.

Under Secretary GAD (Sonam) Date: 14 May

iv. Take measures for effective enforcement of (i) Plastic Waste Management Rules, 2016, as amended, and (ii) UT specific bans imposed on identified Single Use Plastic items.

v. Develop policies for supporting the adoption of alternatives to identified Single Use Plastic items prohibited under PWMR, 2016 as amended.

vi. Take measures to strengthen ULB/GPs for segregation, collection, storage, transportation, processing, and disposal of plastic waste.

vii. Take measures for effective monitoring of implementation of PWM Rules, 2016, as amended.

viii. Prepare a detailed road map for activities to build awareness and outreach among public on Plastic Waste Management and reduction on use of SUP items.

ix. Develop strategy for building a strong public movement for mitigation of plastic pollution by involving educational instructional (Schools, colleges, universities), NCC, NSS, Scouts, Youth Clubs, Eco Clubs, opinion makers and voluntary organization, with detailed action plan in this regard.

By order of Lt. Governor, Ladakh.

Sd/-
(Ajeet Kumar Sahu)IAS
Commissioner/Secretary
General Administration Department

Copy as above

Copy also to the:

1. All Administrative Secretaries, UT Ladakh.
2. Deputy Commissioner/CEO, LAHDC, Leh/Kargil.
3. District Informatics Officer, NIC Ladakh for uploading on UT Ladakh website.
4. Private Secretary to Advisor to Hon'ble Lt. Governor for information of Advisor to Hon'ble Lt. Governor, Ladakh.
5. Office/ Order file.

07.05.2021
(Sonam Chhosdon)
Under Secretary
General Administration Department

ANNEXURE-C

Policy and Strategy on Management of

Construction
&
Demolition Waste

September 2022
Housing & Urban Development Department, UT- Ladakh

Executive Summary

The Construction and Demolition (C&D) Waste Management Rules, 2016 were notified on 29th March 2016 by the Ministry of Environment, Forest and Climate Change (MoEF&CC). These Rules are applicable to every waste resulting from construction, remodelling, repair, and demolition of any civil structure of individual or organization or governmental authority that generates construction and demolition waste. The Union Territory of Ladakh is already having a ***"Policy and Strategy on Management of Construction and Demolition Waste (Jammu & Kashmir)- 2020"*** vide a Govt Order No. 70- JK (HUD) of 2020 (Dated: 20-02-2020). However, Ladakh has come a long way in terms of its focus to implement C&D waste management programmes in a comprehensive and outcome-oriented manner since it became a UT on 31st October 2019.

C&D waste consists of the wastes generated during any construction, renovation, and demolition of buildings, roads, and bridges etc. Debris generated due to any natural and anthropogenic disaster is also considered as C&D waste. C&D materials often contain materials that inter alia include concrete, asphalt, wood, metals, gypsum, plastics, and salvaged building components etc. Handling C&D waste is challenging because it is voluminous, heavy, inert and is a mixture of various materials of different characteristics. C&D waste is a clearly emerging concern in the Ladakh region, fuelled by rapid urbanization, private and public construction activities on one hand, and limited incompatible regulation and institutional management on the other. The waste-to-resource approach promotes a paradigm shift in the management of municipal solid waste and the same is very applicable for C&D waste.

Ladakh's most threatening impact towards the region is improper management, of C&D waste which is often disposed, indiscriminately, that impacts adversely the fragile mountain ecology. Thus, formulation of a comprehensive Construction and Demolition Waste Management Policy (C&D WMP) has become inevitable to regulate and manage the waste in a scientific manner.

This policy will be applicable and binding upon all the urban local bodies (including census towns, notified areas), rural local bodies (including revenue villages and hamlets), development authorities, other UT and central government departments, establishments, line agencies and public offices. The policy is limited to C&D Waste Management only.

The key users of this policy will include all the government departments of UT of Ladakh, Units of district and sub-district administrations, Urban Local Bodies, Gram Panchayats, LAHDC, waste management contractors and agencies, Recyclers and Bulk waste generators (institutional, commercial).

The objectives of the C&D WMP can be summarised as follows:

- To ensure that no C&D Waste is dumped in open space by ensuring its proper sources segregation, collection, transportation, and disposal/recycling
- To ensure establishment of C&D waste recycling facilities at the local body level
- Setting up of designated collection points for C&D waste for further processing
- To ensure 100% segregated collection of generated C&D waste in the city limits through dedicated vehicle.
- To ensure at least 50% of C&D waste generated in Ladakh is reused or recycled by 2025

- To ensure bye-back, upto 30%, of sand, stones and finished recycled products for using in government constructions subject to strict quality control & standards prescribed by the BIS
- Achieving and sustaining high cleanliness ranking at national level
- C&D Waste Management infrastructure compatible to extreme cold/dry climate

Some differentiating strategies that may be incorporated in the Union Territory of Ladakh are:

- Mainstreaming Climate Change & Net-zero aspirations of Ladakh
- Use of E-vehicles for collection and transportation of waste materials.
- Utilization of Renewable energy in the processing and disposal of C&D waste plants.
- Setting up of emission monitoring system at the processing and treatment plants.
- A combination of centralized and cluster-based solutions for processing and treatment system shall be incorporated.

Key Activities & Milestones

The UT Administration of Ladakh is taking up following time-bound actions for C&D Rules compliance:

Sl. #	Key Activities & Milestones	*Time limit w.e.f. 1st September 2022
1	Notification of the C&D policy	01 months
2	Setting up of all the Committees/Taskforces at the UT and Local Level	02 months
3	Identification of sites for setting up processing, recycling and storage facilities	03 months
4	Engagement of Consultants for preparing DPRs	03 months
5	Notifications for enforcing C&D waste generators to practice scientific handling and management of wastes at source	03 months
6	Procurement of specialized C&D waste collection vehicles, etc.	06 months
7	Commissioning of recycling and storage facilities	06 months
8	Monitoring by UT PCC	4 times in a year-once in 3 months

Commonly Used Abbreviations

C&D: Construction & Demolition
CAA: Constitutional Amendment Act
CBOs: Community Based Organizations
CPCB: Central Pollution Control Board
CPHEEO: Central Public Health and Environmental Engineering Organization
CPWD: Central Public Works Department
D2D: Door-to-door
DPR: Detailed Project Report
EIA: Environment Impact Assessment
EMP: Environmental Management Plan
GDP: Gross Domestic Product
GP: Gram Panchayat
ICT: Information and Communication Technology
IEC: Information, Education and Communication
MC: Municipal Committee
MoEF&CC: Ministry of Environment and Forests & Climate Change
MoUD: Ministry of Urban Development
MoH&UA: Ministry of Housing & Urban Affairs
MSWMP: Municipal Solid Waste Management Plan
NAC: Notified Area Committee
NAPCC: National Action Plan on Climate Change
NGO: Non- Government Organization
NMSH: National Mission on Sustainable Habitat
O&M: Operation and Maintenance
PCB: Pollution Control Board
PCC: Pollution Control Committee
PPE: Personal Protection Equipment
PPP: Public Private Partnership
RCA: Recycled Concrete Aggregates
RCC: Reinforced Cement Concrete
RWA: Resident Welfare Association
SHGs: Self Help Groups
SLB: Service Level Benchmark
SOP: Standard Operating Procedure
TPD: Tonnes per Day
ULB: Urban Local Body
WMP: Waste Management Plan

Contents

1.7 Preface:

The issue of Construction and Demolition (C&D) waste generation and its handling have gained attention in the backdrop of Sustainable Development Goals and Climate Change Mitigation strategies. Union Territory of Ladakh is witnessing rapid growth in urbanization and infrastructure developmental works and construction works are taking place at unprecedented rate under various schemes and developmental programmes for roads, buildings, water supply, sewerage, bridges, and allied infrastructure. With growth of tourism, exponential growth of construction of hotels, guest houses are being witnessed. While many new buildings are coming up, demolition, retrofitting and redevelopment of old buildings are also taking place. As a result, immense amount of waste is being generated in the form of debris, building materials, etc. Systematic intervention is, therefore, required not only for proper handling the C&D waste but also to convert this waste into useful resource to make the construction sector more sustainable with an ecosystem of circularity.

In Ladakh, the issue of C&D waste has entered the public discourse relatively recently and therefore, there have been historically very little efforts to keep segregated records of its generation and composition. In addition, C&D waste is often clubbed with other form of municipal solid waste and thus, the magnitude of the problem is underestimated by all stakeholders involved. This has resulted in inadequate formal system for management, reuse and recycling of C&D waste in the UT.

The Technology, Information, Forecasting and Assessment Council (TIFAC) considers approximately 25% of all solid waste to be C&D waste and therefore, using this metric, it can be estimated that a large quantity of C&D waste may also be generated in the UT of Ladakh. As there is no comprehensive and reliable data on C&D waste, it is necessary for a complete and credible assessment to be carried out by the local bodies on the actual C&D waste that is generated within their respective jurisdictions. Such data should be compiled by the Local Bodies. This is in line with the requirement under C&D Rules where local bodies are required to keep track of the generation of construction and demolition waste within its jurisdiction and establish a database and update it once in a year. The local bodies should recognize C&D waste as a separate stream of waste and begin the enumeration of its quantities of generation, collection and disposal in the statutory reports.

The Swachh Bharat Mission under Ministry of Urban & Urban Affairs (MoH&UA) envisages processing of 100% solid waste generated in cities / towns by 02 October, 2019 as a key objective, which includes C&D wastes. MoH&UA (earlier MoUD) vide its circular dated 28th June, 2012 stated all states to set up C&D waste recycling facilities in all cities with population of over 1 million. Unlike other rules addressing various key urban wastes such as MSW, plastic wastes, Biomedical waste, the

Construction and Demolition (C&D) Waste Management Rules, 2016 are NEW Rules that were notified on 29th March, 2016 by the Ministry of Environment, Forest and Climate Change (MoEF&CC). They apply to every waste resulting from construction, remodelling, repair, and demolition of any civil structure of individual or organization or governmental authority that generates construction and demolition waste with a definite timeline mentioned below.

a) one year and six months from the date of its notification for million plus cities based on 2011 census of India;
b) two years from the date of its notification for 0.5 to 1 million cities based on 2011 census of India; and
c) three years from the date of its notification for other cities (<0.5 million populations) based on 2011 census of India

Therefore, this Rule is applicable to the ULBs in Ladakh despite not being very populous.

1.8 Legal & Regulatory Framework & Mandates

A. C&D Waste Management Rules, 2016 - Notification

The Construction and Demolition (C&D) Waste Management Rules, 2016 was notified vide G.S.R. 317(E) 29th March, 2016 by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt of India.

Definition of C&D waste & Applicability of the Rules

As per Rule 3 (c) "construction and demolition waste" means waste comprising of building materials, debris and rubble resulting from ***construction***, ***re-modelling***, ***repair*** and ***demolition*** of any civil structure.

The rules shall apply to every waste resulting from ***construction***, ***re-modelling***, ***repair*** and ***demolition*** of any civil structure of individual or organization or authority who generates construction and demolition waste such as building materials, debris, rubble.

Bulk C&D waste generators

(i). Under Rule 3 under Definitions – sub-rule (1)(j) "**waste generator**" means any person or association of persons or institution, residential and commercial establishments including Indian Railways, Airport, Port and Harbour and Defence establishments who undertakes construction of or demolition of any civil structure which generate construction and demolition waste.

(ii). Under Rule 4 sub-rule (3) :

Waste generators who generate *more than 20 tons or more in one day or 300 tons per project in a month* are **bulk C&D waste generators**. As per the Rules, the segregation by bulk C&D waste generators shall be done into four streams such as:

a. concrete

b. soil
c. steel, wood and plastics, bricks and mortar

B. C&D Waste Management Operational Guidelines of CPCB

Rule 10 sub-rule 1(a) of C & D Waste Management Rules, 2016 mandates the Central Pollution Control Board (CPCB) to 'prepare operational GUIDELINES related to environmental management of construction and demolition (C&D) waste management'. In complying with the above Rule, the Guidelines have been prepared to:

a. promote an integrated approach, whereby environmental management of construction and demolition waste is given due consideration throughout the duration of the project.
b. approach towards reduction of environmental impacts. The guidelines recommend pollution mitigation measures in operation of C & D dump sites / waste processing facilities.

Though guidelines focus mainly on facilities generating more than 20 tons or more in one day or 300 tons per project in a month of installed capacity (bulk generators) in cities / towns however, the mitigation measures suggested can be scaled after consultation with the concerned department in the state government. The reference to 'operators' in these Guidelines implies operators of bulk C & D waste management / waste recycling / processing facilities.

C. Thrust areas in C&D waste management – National Building Code (NBC)

Some key thrust areas specified in the NBC 2005 regarding C&D waste reuse/recycling are:

- Establish utilization of C&D wastes in concrete and concrete based products by preparing standards
- Quality control and certification
- Need for popularizing products from C&D waste
- R&D activities on continuous basis in tandem with manufacturing industry and users
- Achieving environment protection through C&D waste utilization
- Optimizing utilization pattern of traditional materials by interfacing the same with supplementary materials.

1.9 Scope of this Document

- The policy is limited to C&D waste management.
- The management of C&D waste is a mandate for the local bodies in Ladakh. Hence, looking at the recent growth in the construction and infrastructure activities, the UT has decided to address this with suitable interventions.
- The policy will be applicable and binding upon all the urban local bodies (including census towns, notified areas), rural local bodies (including revenue villages and hamlets), development authorities, other UT and central government departments, establishments, line agencies, public offices etc.

1.10 Potential Users of this Document

This policy is aimed to provide guidelines and strategy for improvement of C&D waste management in the Union Territory of Ladakh. The main users include the government departments of Union Territory of Ladakh, Urban Local Bodies, Gram Panchayats, LAHDC, waste management contractors and agencies, recyclers, bulk waste generators (institutional, commercial) and the individual households.

1.11 Vision

"Attaining a comprehensive construction & demolition waste management, including its efficient segregation, collection, transportation and recycling, for making Ladakh the cleanest region in the country."

1.12 Objectives

Rule 9 (1) of the C&D Rules, 2016 envisages that the concerned Secretary In-Charge of urban development in in the UT of Ladakh is required to prepare a State Policy Document with respect to management of construction and demolition of waste. Pursuant to this provision, this policy document is being prepared for the UT of Ladakh to sustainably manage the C&D Waste considering generation its increasing trend of generation. This policy is aimed at providing a broad strategic framework for all the concerned stakeholders to prepare their own action plans and for management of C&D waste within their jurisdictions.

The objectives of the Union Territory of Ladakh Construction and Demolition Waste Management Policy are:

- To ensure at least 50% of C&D waste generated in Ladakh is reused/recycled by 2025
- To ensure that no C&D waste is dumped in open space that may impact the fragile ecology and people's quality of life
- 100% source segregation and handling of C&D waste and its proper collection, transportation, and disposal/recycling

  To ensure establishment of C&D waste collection points, collection and transportation facilities and processing and recycling facilities at the local body level
- To ensure bye-back, upto 30%, of sand, stones etc. and finished recycled products for using in government constructions subject to strict quality control and standards prescribed by the Bureau of Indian Standards (BIS)
- Achieving and sustaining high cleanliness ranking at national level
- Setting up state of the art C&D waste management infrastructure compatible to extreme cold/dry climate
- To contribute in developing Ladakh as a "Carbon Neutral Region"

Chapter 2. A Brief Status of C&D Wastes in Ladakh

2.1 Major Sources of C&D Waste?

In Ladakh, the waste mostly comprising of building materials, debris and rubble resulting from construction, remodelling, repair and demolition of any civil structure. The activities that mainly generate C&D wastes are:

- Widening, excavation, laying of concrete roads
- construction/renovation/demolition of other public infrastructure like utility ducts, parking lots, public transport terminals, passenger shelters etc.
- construction of new commercial/residential/ industrial buildings,
- demolition and renovation of existing/old commercial/residential/ industrial buildings
- installation and service of public utilities (telephone/water/electricity/sewage pipelines)
- Debris generated due to landslide and stormwater run-off.

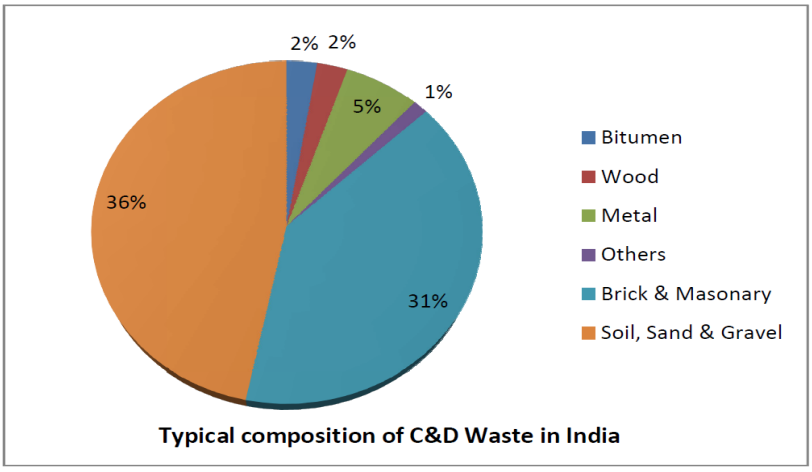
Mostly, C&D waste has two components:

(i) **Major components**- comprising of cement concrete, soil, stones, bricks, cement plaster, steel from RCC, door/window frames, roofing support, railings of staircase etc., rubble, stone- marble, granite, sandstone), timber/wood, and

(ii) Minor components- include conduits of iron, plastic, pipes of GI, iron, plastic, electrical fixtures of copper/aluminium wiring, wooden batons, switches, wire insulation, panels i.e. wooden, laminated and others such as glazed tiles, glass panes etc.

2.2 Components of C&D Waste

The composition of C&D waste depends on several factors. The composition varies according to the nature of construction projects and depends on the stage and degree of urbanization. Climatic condition is also a major determinant of waste characterization. Since there is limited data available in Ladakh, as a baseline, this policy considers the typical composition of C&D waste in India as suggested by Technology, Information, Forecasting and Assessment Council (TIFAC), which is shown in the following diagram:



(Source: Technology, Information, Forecasting and Assessment Council)

2.3 Who are C&D Waste Generator?

- **C&D waste generator** is defined under the C&D Waste Management Rules 2016, as "any person or association of persons or institution, residential, and commercial establishments including Indian Railways, airport, port & harbour and defense establishments who undertake construction and demolition of any civil structure which generate C&D waste."
- Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month have been identified separately in the C&D Rules and have additional obligations attached to them as **Bulk Waste generators**.
- Another type of generators falls under category as per C&D Waste Management Rule is **Service Providers**. These are authorities who provide services like, water, electricity, sewerage, telephone, roads, bridges, drainage, etc. who generate such wastes during their activities for such services, that includes demolition, extraction, excavation, boring, civil works, etc.
- Though the definition of waste generators- bulk as well as service providers, is comprehensive but local bodies can consider expanding their scope by further categorizing as per the C&D Waste 2016 and SWM Rules 2016 in order to ensure compliance by such generators in terms of segregation of waste, submission of waste management plan, transport of C&D wastes to processing plants, etc.

2.4 Challenges of C&D Waste Management in Ladakh

At present, in Ladakh, following challenges exist as regards to C&D waste:

(a) Items, that cannot be re-used, are disposed in open places due to non-availability of designated site for disposal and processing, High seasonal variation in generation of waste and disproportionate generation of waste concentrated in urban areas
(b) Improper source segregation
(c) Improper site management, limited surveillance, and regulatory interventions, and
(d) Limited collection, transportation, sorting, and processing/recycling facilities

Chapter 3: Principles and Strategies for the Management of C&D Waste

3.1 Principles

The Concept of "6R" Principle has been proposed for Refusing, Reducing, Repurposing, Reusing, Recovering and also Recycling wastes of the construction industry. The different processes involved in construction projects namely designing, production and manufacturing at the construction sites directly lead to waste creation, therefore it is essential for a green economy to follow the "6R" principle in the construction projects.
The guiding principles for C&D Waste Management in Ladakh is as follows:

6-Rs for Construction & Demolition Waste Management

- **REFUSE** - To ensure source segregation, the local bodies/ authorised agency shall refuse to accept wastes mixed with C&D wastes and shall ensure penalizing the violators as per the notified C&D waste penalties.
- **REDUCE** - Potential wastes can be identified early in the design process itself and measures should be taken to minimize the waste that is likely to be generated. Waste reduction can be achieved by using recyclable building materials, planning for flexible spaces and ensuring that designs are adaptable to changing uses and are amenable for deconstruction and reconstruction.
  Source reduction measures such as preservation of the old building, optimization of the space in new buildings, designing building and infrastructure which reduce use of construction material on site and promote use of recycled C&D waste materials.
- **REPURPOSE** – The potential waste streams are to be identified for adaptive reuse for different purposes.
- **REUSE** - This involves identification of waste that can be salvaged for reuse in the current Project or another Project or that can be donated. A comparison of the value of the materials "as it is" for salvage or to its value as materials for recycling may be considered prior to reuse in many cases. Some of these materials may be valuable to reuse on-site; others may be sold to be used as building material in another site.
  Buying used C&D materials and recycled content products for use in new construction can:
  - Boost the local economy as recovered materials are typically locally sourced.
  - Lower construction and renovation costs while maintaining building function and performance.
  - Ensure materials collected from reuse and recycling programs will be used again in the manufacture of new products and/or new construction, thereby fully realizing the benefits of reuse and recycling efforts;
  - Preserve local architectural character and historic significance (in cases of preserved or restored buildings).

  Using deconstruction prior to the demolition of the building to salvage reusable materials from the construction site where the items which are usable directly are screened out from the debris and put into the intended use without further processing. These could include useful products like doors, and windows, bricks, reinforcement, structural steel that can be taken out with little extra efforts and put into reuse without much processing. Thus, it is recommended that prior to any demolition activity that takes place, the waste

generator deconstructs the building whereby the building is dismantled, and any salvageable reusable materials are collected and used on-site or on another site. Re-use of recycled C&D waste materials in the rural roads may be promoted.

- **RECOVERING** - To optimize the value chain of C&D waste, suitable material recovery and processing facilities are to be set up to convert into other useful products. The Solid Waste Management systems will be oriented towards maximum recovery of resources from discards for recycling and reuse. Options for setting up of Swap shops, Waste Exchange Programs, Material Recovery Facilities (MRFs) and Resource Recovery Centres will be explored to ensure maximum recovery of resources.
- **RECYCLE** - After exploring all the options to prevent waste and salvaging and reusing materials, the next step is to recycle as much of the remaining debris as possible. Recycling saves money by minimizing disposal costs.
  Once the C&D waste are segregated and reusable items are taken out, the leftovers waste should be recycled to the extent possible. This is also vital for ensuring that minimum amount of waste is sent to the landfills. Only rejected waste from the C&D waste recycling process should be disposed of in sanitary landfills.
  Publicizing the collection points identified by ULBs in their respective jurisdictions incentivizing for the use of recycled waste materials.

3.2 Strategies for C&D Waste Management

The Strategies for C&D waste management that would be adopted in UT of Ladakh taking into considerations of environmental concerns are as follows:

I. C&D Waste Management

The involvement of all stakeholders and adoption of suitable management practices is among the key strategies to successfully achieving efficient C&D waste management.

(a) Declaration of No C&D Waste Dumping Zones

Forest land, water bodies, stormwater drains, flood plains, meadows, etc. are be declared as no C&D waste dumping zones and any non-compliance will be treated as a cognizable offence.

(b) Publicize Designated Dumping Site

- The name and capacities of the designated dumping sites will be made available on a web platform.
- The dedicated website/ link should be available in public domain to apply for the permit for transportation of the C&D waste, to remit the fee and to obtain the permit for transportation.

(c) Provisioning of Waste Reception Facilities

- Stock-pilling area- Area located for temporary stockpile of waste for later use
- Recycling area
- Reclamation sites- designated part of a development project that excepts C&D waste for reclamation purpose
- On site collection of waste through MC dumpers

(d) Other Strategies

- Establish a baseline inventory of C&D generation and characterization

- Promote an ecosystem for the Circular Economy: The circular economy is based on strategies, practices, policies, and technologies to achieve principles related to reusing, recycling, redesigning, repurposing, remanufacturing, refurbishing, and recovering C&D waste materials to preserve natural resources. It provides the necessary conditions to encourage economic and social actors to adopt strategies toward sustainability.
- Doorstep collection against fee by the local bodies to promote cleanliness and ownership
- Designated collection points in strategic locations to enhance collection efficiency
- Private Sector participation in the C&D waste management processes
- Collaboration of various stakeholders and convergence of programmes for optimizing the co-benefits
- Integrating C&D policy and action plans with the Building Bye-laws by providing the applicants with provision for declaration of projected C&D waste generation and payment of the same for availing services towards its management by the authorities.
- ITES interventions to streamline C&D Waste Management system includes digital surveillance, sensor-based dust and air quality monitoring, inventory management etc.
- Citizens' participation to make it Citizen driven effort with mass awareness towards C&D Waste Management.
- The local bodies can also explore options of introducing subsidy and environmental tax policies to promote C&D waste recycling. Suitable provisions are to be incorporated in the bye-laws.

II. 'Sustainable Model' on C&D waste management

The key components of Ladakh's 'Sustainable Model' on Construction and Demolition (C&D) will include the following:

- Estimation of C&D waste generation and its characterization across geographies.
- Feasibility assessment on economically viable C&D waste recycling options.
- Feasibility assessment for viable waste management model.
- Identified sites and approval of land for development of integrated C&D waste processing facilities.
- Awareness campaign for promoting source segregation of C&D waste by generators.
- List out and mandate use of recycled products from C&D wastes and facilitate to create a supportive circular ecosystem

Chapter 4: Outline of the Standard Operating Procedures (SOPs) for C&D

Management of C&D waste is utmost important which requires full-proof flow of C&D waste management plan right from its identification, segregation, storage, collection, transportation and aggregation by different categories of waste generators to its recycling and re-use.

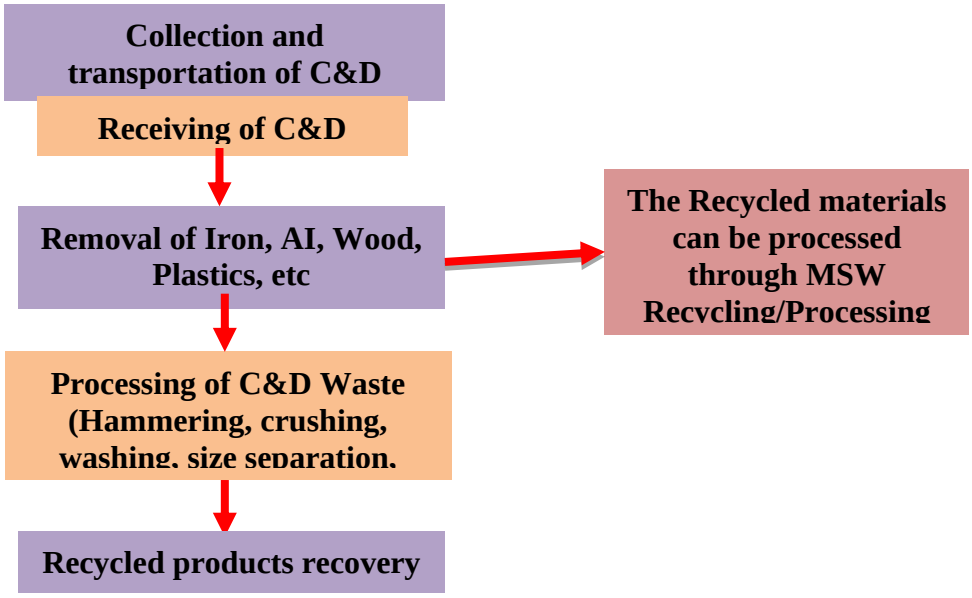
Following are the typical processes to be followed:

4.1. Advance intimation

Any C&D bulk waste generator will be required to submit a waste management plan (WMP) and get appropriate approvals from the LBs before starting any major construction/demolition/remodelling work. Similarly, service providers are also required to prepare a comprehensive WMP that covers segregation, storage, collection, reuse, recycling, transportation, and disposal of the C&D wastes.

The LBs/any concerned authority will examine and sanction the WMP of the generators within a period of one month of its submission.

Similarly, any government agency/department/private executing agencies in the UT, while constructing roads or any other project should submit a WMP which should include key waste types, arrangements for onsite sorting and proposed disposal of surplus earth. Copy of each award letter should be submitted to the concerned LBs/authorized agency for information.



4.2. Segregation and in-situ storage of C&D Wastes

- Every waste generator will be responsible for collection, segregation, storage and transportation of C&D wastes that they generate within their premises.
- The waste generator is required to ensure that other wastes such as solid/hazardous wastes do not get mixed with the C&D wastes and that the C&D waste is stored and disposed separately.
- Every waste generator is mandated to keep the C&D wastes within the premises or get the waste transported to the assigned collection centres by the local bodies or handover it to the authorised processing facilities of C&D waste by ensuring that there would not be any littering of such wastes.

- ***Bulk waste generators*** are required to segregate their C&D wastes into 4 streams such as
  (i) Concrete,
  (ii) Soil,
  (iii) Steel, wood and plastics, and
  (iv) Bricks and mortar.

  They are expected to maintain the dedicated hook loader bins/skips or tractor trolleys (or through renting) to be kept within the construction sites. Once these containers are full, the bulk waste generators should Inform the LBs or the authorised private party to replace the filled skips/trolleys with the empty ones. In case of bulk waste generators responsible for construction, demolition, and/or renovation of large commercial or housing projects, infrastructures such as roads, bridges/flyovers, other transport means viz. metro lines, railways, etc, or demolition of unstable, old, or unauthorised structures, etc the area should be cordoned off and the C&D wastes should be segregated, stacked, and transported separately without obstructing any public road or causing any hinderance
- ***Service providers*** are required to prepare comprehensive waste management plan including segregation, storage, reuse, recycling, transportation and disposal. They are expected to prepare the comprehensive Waste Management Plan within 6 months from the date of notification of this policy.
- In case where skips or trolleys are not available, manual loading and unloading of wastes could be permitted provided all necessary safety precautions are taken to ensure that all accidents are avoided.
- The dust control measures with respect to storage of construction material and demolition activities shall be taken up by the waste generators as per the CPCB Guidelines, 2017.

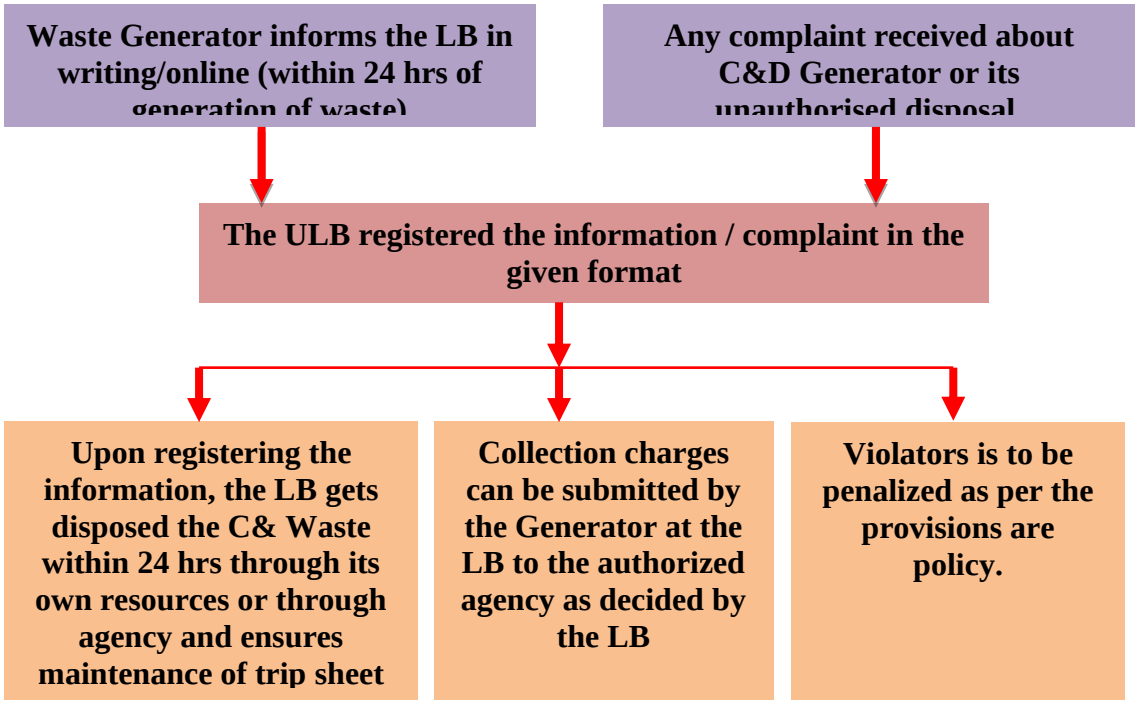
4.3. Collection and Transportation of C&D Wastes

For the on-call paid services, collection and transportation of the C&D wastes shall be done by the Local Bodies (independently or in clusters) of the UT of Ladakh or by their authorised private agency within 24 hrs of receiving information or within a mutually agreed timeframe.

The followings shall be taken into considerations while planning for the collection and transportation of C&D wastes;

- For small generators of C&D Waste (such as waste emanating from petty construction, repair, or maintenance works), LB shall consider two options, (a) deposit of C&D waste by the small generators at collection centres/earmarked areas; or (b) removal of waste by LBs through itself or authorised private party on payment basis. Fees for collection of C&D waste are to be defined by the concerned LBs/authorised agency.
- Waste generators who generate 20 tons or more in one day or 300 tons per Project in a month shall be responsible to segregate the C & D waste in different streams at their sites and shall recycle and reuse the waste to the maximum extent possible. The fees for collection of C&D waste are to be defined by the concerned LBs/ authorised agency.
- To create awareness about management of C & D Waste, LB shall carry out massive awareness campaigns & will also release public notices in at least two local new papers.

- All LBs shall publicize the rates for collection, transportation & storage of C&D Waste & shall publish such rates on their websites, offices, local newspapers, & public places.
- The Standard Operating Procedure (SOP) for the entire collection and transportation process is given below:-



4.4. Recycling process and Resuse of C&D Wastes

4.4.1 Recycling of C&D waste

This is essentially required because it reduces the dependence on natural resources & eliminates adverse environmental impacts such as mining of virgin materials. Recycling of C&D wastes also reduces the quantum of C&D waste ending up at landfills & open spaces.

As mandated under the C&D Rules, the LBs in Ladakh to make arrangements for processing, recycling and disposal of C&D waste, either themselves or by appointing authorised agencies.

The recycling of C&D waste will be primarily divided into the wet and dry process. The dry recycling process involves:

- segregation into streams such as bricks, concretes, etc and removal of materials such as large metal scraps, cardboard, paper, plastic and wood from the C&D waste;
- Dry process involved is sizing, crushing, removal of scrap steel and screening it into different size fractions (20mm, 12mm and 4.75mm).

- primary & secondary crushing of cleaned C&D waste to reduce size of the materials;
- screening of the particles for extracting aggregates of various sizes.

In the wet process after secondary crushing and screening the material is washed and screened again to remove loose soil and grit. The wet process reduces the residue (loose soil and grit) which cannot be converted into recycled products. The selection of the appropriate process of recycling of C&D waste should take into account factors such as type of soil, and other geological conditions, quality of segregation, use of end products, etc. For example, using the wet process with black soil would create sludge rather than washing away the residue. C&D waste such as concrete and bricks can be crushed and used as coarse or fine aggregates while soil, sand, and gravel can also be reprocessed for productive use as fine aggregates. These finished products can be used for non-structural purposes such as kerbstone, pave blocks, and road constructions. Coarse and fine aggregates can also be used as a part replacement for natural sand.

4.4.2 Technology/Machinery of Recycling of C&D Waste

Arrangement of appropriate modern equipment and machinery is essential in the demolition, transportation, sorting, crushing and recycling process. Such equipment may be jaw crushers, magnetic separators, vibratory screens, washing equipment etc.
The recycling plant consists of the following technologies:

1. Feed hopper
2. Jaw Crusher machine
3. Pre-Screening
4. Washing & aggregate cleaning
5. Trash Screen for removal of light weights
6. Sizing Screen for washed Aggregate
7. Hydro cyclone system for Sand washing
8. Water Management system for recycling of process water

Among the major & minor components of C&D waste, the most unpredictable and difficult materials are clay (soil) and all types of floating materials like plastic carry bags, sachets, thermocol etc. Recycling Technology has provided the solutions to tackle these difficult materials and make C&D waste an acceptable quality product for re-use.
The following products can be recovered from recycling:

1. Recovery of washed sand for construction
2. Recovery of 2-3 sizes of mixed Aggregates
3. RMC made with recovered material
4. Value-added products like Kerb Stones, Pavement Blocks and Concrete Bricks etc.

4.4.3 Re-use of C&D Wastes

Construction and Demolition waste to be re-used in the following manner:

- Reuse (at site) of bricks, stone slabs, timber, conduits, piping railings etc. to the extent possible and depending upon their condition.
- Sale / auction of material which cannot be used at the site due to design constraint or change in design.
- Plastics, broken glass, scrap metal etc. can be used by recycling industries.

- Rubble, brickbats, broken plaster/concrete pieces etc. can be used for building activity, such as, levelling, under coat of lanes where the traffic does not constitute heavy moving loads.
- Larger unusable pieces can be sent for filling up low-lying areas.
- Material, such as, sand, dust etc. can be used as cover material over sanitary landfill.
- Used as top earthen layer in road construction as a granular sub-base
- Processed C&D waste (after sizing & sieving) can be used in road pavement for sub-base construction.

4.5. Utilization of C&D Waste Streams

- Reusing of C& D Waste: It does not require any further processing to convert into a useful product. The items which are usable directly are screened out from the debris and put into the possible use without further processing.
- Recycling of C&D Waste: Once the waste generated from construction and demolition activities has been segregated and reusable items are taken out, the leftover is available for further processing i.e. recycling into next useful stage.

4.6. Provision for C&D Waste Processing Plants & Concerned Stakeholders

- It is necessary to determine the capacity of C&D waste processing plants taking periodical inputs from the organizations such as the BRO, PWD, NHIDCL. It is desirable to provide such data by the concerned organizations to ascertain the C&D Waste volume in order to ensure establishing appropriate capacity of the C&D waste processing plants in Leh and Kargil districts.
- All the concerned stakeholders should ensure their willingness to use such facility.
- It is advisable to make sure that the C&D processing plant must not be close to the city area, and it should be away from the habitation, considering the environmental concerns.
- The DCs and LPCC of Leh and Kargil districts respectively should identify suitable land parcels for construction of C&D Waste Processing Plant in Leh and Kargil for the H&UDD and MCs to set up plants.
- The DCs and LPCC of Leh and Kargil districts respectively should identify suitable land parcels for construction of regional C&D Collection Points and treatment facilities in the census towns in Ladakh. The adjoining rural C&D wastes should also be processed in such facilities.
- It is advisable to make sure that adequate amount of land should be provided so that the designated dumpsites for the C&D waste could also be accommodated adjacent to the processing units.
- A suitable provision shall be made by the Local Body to integrate C&D Waste Management with building plan approval system.
- A notification be issued by the EOs of the MCs of Leh and Kargil making a provision to incorporate users' fees and penalties in the policies.

4.7. Provision of Land and Environment Safeguard

- The concerned Local Body/district administration will designate suitable lands and/or keep suitable provisions in their respective Development Plan/ Master Plan/Zonal Plan/Town Planning Schemes etc. for future infrastructure facilities under.

- Identification of land for common / cluster level infrastructure should also be made jointly by the respective district administration, local bodies, representatives from the PCC and Forest Department.
- To minimize the adverse impact on environment, all the C&D processing/recycling facilities shall maintain a setback distance or buffer zone in line with the guidelines on setback distances or buffer zones given in the CPCB Guidelines on Environmental Management of C&D Wastes, 2017. The concerned administration/LBs in consultation with the UT PCC should prescribe buffer zone on case-to-case basis considering all the environmental, social and economic factors.

4.8. Procedure for application and grant of permission

- Applicant or the person concerned, intending to commence construction within the area of the Local Body, shall in writing submit detailed estimate of muck to be generated from the plot/construction site to the Local Body on the prescribed proforma annexed with these bye- laws at the time of submission of his/her building map/plan for sanction. However, in the case of repair of building or in the case where no planning permission is required, the permission for dumping debris shall be obtained from the Local Body authorities by moving an application mentioning therein full particulars of the applicant, location of the building and the estimate/quantity of muck to be generated.
- The estimate submitted by the applicant shall be verified by the technical wing of Local Body after spot inspection and thereafter shall be sent to the concerned branch for raising the bill for necessary permission.
- The permission for dumping of debris shall be accorded only after obtaining receipt of the amount to be deposited by the applicant in the Local Body on this account.
- The place for dumping of muck shall be communicated to the applicant by the Local Body in writing and the name of the place/site for dumping of debris by the applicant shall also be mentioned in their building sanction letter. Further, intimation of the same shall also be given to the concerned Local Body or to the concerned agency or the contractor hired or engaged by the Local Body for managing the dumping site.
- During transportation of the muck, a person shall have to carry the original permission, a copy of which shall be affixed on windscreen of the vehicle and the same shall have to be shown to the authorized officer/official of Local Body at the time of inspection. However, in case of manual transportation of debris the person carrying the same shall have to show the original sanction to the inspecting staff/authorized officer/official at the time of inspection.
- There shall be a restriction on movement of the vehicles carrying muck after the sunset and before the sunrise. The normal timings for dumping muck at the dumping site will be between 9:00 am to 5:00 pm. However, in case of exigencies and in view of traffic regulations in the area the Local Body may in writing relax such timings.
- No one shall be permitted to carry the digging and excavation of plot or land after sunset and before sunrise but the Local Body in the larger public interest or in the case of emergent circumstances may relax such imposition/restrictions, on receiving written request from the applicant or the concerned agency or the authority interested in this regard.

- The person, after obtaining the sanction of building map from the competent authority or before raising the construction at site, is required to install a painted board of the size of 3' x 2' indicating therein the number and date of the sanction, commencement of construction and hours during which construction can be carried out, time when excavation can be done, name of dumping site allotted to the applicant for the purpose of dumping muck, nature of sanction, the area of construction sanctioned on each floor and the telephone number of the Control Room set up by the Local Body for entertainment of complaints etc.
- The authorized officer/official of Local Body shall prescribe the conditions relating to the application of muck generation from the plot, grant of sanction for muck disposal and condition relating to affixing of board at site giving therein the detail as mentioned in clause at the time of grant of building sanction.
- Each vehicle carrying the C&D waste should be entered on the respective dumping site and its entry with its load should be made against the concerned dumping site simultaneously so that the capacities of the dumping sites are updated regularly on the web platform.
- At the end of the year cross checking of the permits issued and permits entered on the dumping sites should be checked. In case of discrepancies (e.g. the person has deposited the permit fee but has not dumped the material on the designated site) the violator should be penalized
- It may be better to include the transportation charges in the permit fee and provide the transportation to the C&D waste generators

Chapter 5. Legal & Institutional Framework: Roles & Responsibilities

5.1 Legal & Regulatory Framework

(i) UT SWM Policy and Strategy – The Union Territory of Ladakh will soon have a state policy on solid waste and plastic waste management to achieve 'zero waste' status through sustainable interventions, innovations and technology. The policy document has been drafted with a vision to make Ladakh a garbage-free, energy-efficient and carbon-neutral waste management region so that it emerges as one of the cleanest areas in the country. Once notified, the policy will be the overarching strategic direction for waste management in the UT.

(ii) UT C&D Policy and Strategy – this document

(iii) Local Body Bye-laws for SWM

Under the overarching principles and strategies outlined in this policy; the Local Self Governments (ULBs & GPs) will frame Solid Waste Management Bye-Laws for effective and time-bound management of solid waste in the region. H&UDD and R&PRD will facilitate to develop template Bye-Laws that can be adapted by the Local Authorities with modifications to suit their local demand.

The Bye-Laws will incorporate necessary provisions from the Construction and Demolition Waste Management Rules 2016. The Bye-laws would also address the relevant guidelines of CPHEEO, CPCB and PCC and bring in regulations and bans on specific materials, products, or processes, as well as incorporate incentives and disincentives for effective implementation of solid waste management rules and shall be facilitated by gazette notification of bye-laws once adopted by local bodies.

(iv) Notifications & Orders

Subsequent to the bye-laws, the district administration and/or the local authorities will issue specific notifications/orders:

- to curb and prohibit open dumping of C&D Waste
- to make in-situ waste management compulsory for the bulk generators
- to regulate waste management during the tourist seasons

Some of these notifications have already been issued. Notifications issued by the MC Leh and Kargil is provided in Annex 1.

5.2 Institutional Framework

Following are the existing arrangements so far and the same arrangements will also be responsible to monitor the C&D wastes.

(i) Institutional Framework at the UT-level

The proposed linear chain of command for implementation of towards a Zero-waste system will have the below mentioned institutional arrangement for accountability, decision making, guidance, implementation, and monitoring:

- **UT Level Apex Committee**
  A Committee chaired by the Advisor to the Hon'ble LG, as envisaged in SWM Rule 2016, has already been formed with members for periodical evaluation and oversee the implementation of waste management in the UT as per the MSWM Rule 2016 and subsequent Orders of Hon'ble NGT to Solid Waste Management. The committee is comprised of the following members:

1.	Advisor to the Hon'ble Lt. Governor, Ladakh	Chairman
2.	All Administrative Secretaries, Ladakh	Members
3.	Administrative Secretary, Law Department, Ladakh	Member
4.	Additional Director General of Police/Head of Police, Ladakh	Member
5.	Member Secretary Pollution Control Committee, Ladakh	Member Secretary
6.	Director, Rural Development & Panchayati Raj, Ladakh	Member
7.	Director, Industries and Commerce Department, Ladakh	Member
8.	Director, Urban Local Bodies, Ladakh	Member
9.	Director, Health Services, Ladakh	Member

This Committee will also monitor implementation of C&D waste in the UT.

- **State Level Advisory Body**

  A Committee chaired by the Secretary, H&UDD, as envisaged in SWM Rule 2016, has already been formed with members for periodical evaluation and running the state level campaign for Zero Waste approach to Solid Waste Management. The committee is comprised of the following members:

  - Administrative Secretary Housing & Urban Development Department
  - Administrative Secretary Rural Development Department
  - Member Secretary Pollution Control Committee
  - Director H&UDD Ladakh
  - Director Horticulture/Agriculture Ladakh
  - Representative of Revenue Department
  - Representative of Labour Department
  - Three representatives from Local Bodies to be nominated by the Housing & Urban Development Department by rotation in each meeting of the Body (By rotation from the list of ward members of both districts arranged alphabetically)
  - Executive Officer, Municipal Committee, Leh & Kargil

  <u>From the Government of India:</u>

  - Representative from Ministry of Environment, Forest and Climate Change, Government of India
  - Representative from Ministry of Housing and Urban Affairs, Government of India
  - Representative from Ministry of Rural Development, Government of India

This Committee will also look in the implementation of C&D waste in the UT.

(ii) Institutional Framework for the Urban Areas

- **Secretary (UD&HD)** will assume the responsibility of implementation of UT Policy on C&D WM and monitoring of the same in all Urban Local Bodies. Secretary may delegate coordination, implementation, and monitoring of the

state policy to any of his team members in the rank of Mission Director / Under Secretary / Deputy Secretary.

- **Pollution Control Committee** will have the responsibility of monitoring the compliances and effectiveness in the entire waste management cycle. PCC will also be responsible for seeking periodic report and necessary coordination with the CPHEEO/CPCB for guidelines and necessary advisories.

- **Divisional Commissioner** will assume the responsibility to periodically review the progress of C&D WM implementation in the UT.

- **Director of Urban Local Bodies** will assume the responsibility to periodically review the plans and progress of C&D WM implementation in the Municipal Committee/urban areas and for providing guidance and instructions for necessary corrective actions.

- **Deputy Commissioner** will assume the responsibility to periodically review the plans and progress of C&D WM implementation in the respective districts and for providing guidance and instructions for necessary corrective actions. S/he will also be responsible for allocation of suitable lands for setting up of C&D WM infrastructures.

- **Local Authority Level Monitoring Committee -** A Committee chaired by head of Urban Local Body assisted by Municipal Executive Officer. The committee will have all elected representatives, representatives from clusters / ward level committees, invited experts and NGO representatives.
  Indicative Members:
  (a) Elected representatives (b) Representatives from Ward/Cluster level committees (c) Representatives from Educational institutions (preferably teaching staff) (d) Representatives from youth clubs (e) Experts working on Public Health, Sanitation and Waste Management (f) Environmental activists & Educational activists (g) NGO & Civil Society Organisation representatives (h) Representatives from Business community (Shopkeepers, Hoteliers, Traders, Workshop owners etc.) (i) Representatives from house owners and residents.

- **Municipal Executive Officer** will be responsible for the effective solid waste management programmes and process at the Urban Local Body level. Municipal Executive Officer may take technical support and guidance from Technical Support Group and /or City Level Monitoring team. Municipal Executive Officer may engage NGOs, student community, and other people to launch campaigns to set the background for the comprehensive C&D WM programme for the City.

(iii)Institutional Framework for the Rural Areas

- **Secretary (R&PRD)** will assume the responsibility of implementation of UT Policy on C&D WM and monitoring of the same in the rural areas. Secretary may delegate coordination, implementation, and monitoring of the state policy to any of his team members in the rank of Mission Director / Under Secretary / Deputy Secretary.

- **Divisional Commissioner** will assume the responsibility to periodically review the progress of C&D WM implementation in the UT.

- **Pollution Control Committee** will have the responsibility of monitoring the compliances and effectiveness in the entire waste management cycle. PCC will also be responsible for seeking periodic report and necessary coordination with the CPHEEO/CPCB for guidelines and necessary advisories.

- **Director of Rural Development Department** will assume the responsibility to periodically review the plans and progress of C&D WM implementation in the rural areas and for providing guidance and instructions for necessary corrective actions.

- **Deputy Commissioner** will assume the responsibility to periodically review the plans and progress of C&D WM implementation in the respective districts and for providing guidance and instructions for necessary corrective actions. S/he will also be responsible for allocation of suitable lands for setting up of C&D WM infrastructures.

- **Local Authority Level Monitoring Committee -** A Committee chaired by head of Gram Panchayat assisted by Rural Development Officer. The committee will have all elected representatives, representatives from clusters / ward level committees, invited experts and NGO representatives.

  Indicative Members:
  (a) Elected representatives (b) Representatives from Ward/Cluster level committees (c) Representatives from Educational institutions (preferably teaching staff) (d) Representatives from youth clubs (e) Experts working on Public Health, Sanitation and Waste Management (f) Environmental activists & Educational activists (g) NGO & Civil Society Organisation representatives (h) Representatives from Business community (Shopkeepers, Hoteliers, Traders, Workshop owners etc.) (i) Representatives from house owners and residents.

- **Panchayat Secretary** will be responsible for the effective solid waste management programmes and process at the GP level. PS may take technical support and guidance from Technical Support Group and /or GP Level Monitoring team. PS Officer may engage NGOs, student community, and other people to launch campaigns to set the background for the comprehensive SWM programme for the GP.

5.3 Roles of Local Bodies (LBs) – Urban & Rural

Following are the roles of Local Bodies to ensure effective management of C & D Waste:

- The Local Bodies, in coordination with the concerned District Administration, shall identify suitable land for setting up of storage, processing and recycling facilities for Management of C&D Waste.

- LBs can also set up these facilities in clusters by executing an agreement with other LBs which will inter alia include operation & maintenance, sharing of sum received out of collection of C&D waste & other conditions as deemed fit etc.
- The processing or recycling site shall be away from habitation clusters, forest areas, water bodies, monuments, National Parks, Wetlands and places of important cultural, historical or religious interest.
- To promote effective use of C&D Waste and recycled products in different construction activities the following initiatives/activities should be taken by Local Bodies and by the State Government.
- LBs shall keep track of the generation of construction and demolition waste within their jurisdiction, establish a data base and update once in a year.
- LBs shall make provision for giving incentives for use of materials made of C&D Waste in construction activities including in non-structural concrete, paving blocks, lower layers of road pavements, colony and rural roads.
- LBs shall examine and sanction the waste management plan of the generators within a period of two month or from the date of approval of building plan, whichever is earlier, from the date of its submission.
- LBs shall create a sustained system of information, education and communication for construction and demolition waste through collaboration with expert institutions, civil societies and disseminate through their own website.
- LBs shall coordinate with the concerned organizations for giving necessary approvals and clearances to the operators.
- LBs shall identify land for processing or recycling site which is away from habitation clusters, forest areas, water bodies, monuments, National Parks, Wetlands and places of important cultural, historical or religious interest.
- LBs, in consultation with the State Pollution Control Committee, shall ensure that a buffer zone is maintained around solid waste processing and disposal facilities exceeding five Tonnes per day of installed capacity.
- LBs shall ensure that processing or recycling sites are fenced or hedged and provided with proper gate to monitor incoming vehicles or other modes of transportation and facility of CCTV may also be explored.
- LBs shall ensure that the approach and internal roads are concreted or paved so as to avoid generation of dust particles due to vehicular movement and should be designed so as to ensure free movement of vehicles and other machinery.
- LBs shall establish provisions of weigh bridge to measure quantity of waste brought at processing site. Fire protection equipment and other facilities as may be required shall also be provided.

5.4 Duties of UT Ladakh Administration

The following initiatives shall be taken by the UT of Ladakh Administration to ensure effective management of C & D Waste:

- State Government departments and officers dealing with land shall be made responsible for providing suitable sites for setting up of the storage, processing and recycling facilities for construction and demolition waste.
- The Master plans shall incorporate the site in the approved land use plan so that there is no disturbance to the processing facility on a long-term basis.

- Provisions should be made for making procurement of materials recycled from construction and demolition waste mandatory upto a certain percentage in Municipal and Government contracts subject to strict quality control.
- Incentive should be given to LBs for efficient management of C&D waste by devising a criterion.
- Administrative and financial approval to the C&D waste management projects aiming at procurement of land, setting up of infrastructure, capacity building, IEC/BCC etc.

5.5 Duties of Deputy Commissioner

The Deputy Commissioner shall,

- facilitate identification and allocation of suitable land for setting up of C&D waste processing and disposal facilities to local authorities in his district in close coordination with the concerned Departments and the PCC
- review the performance of local bodies, at least once in a quarter on waste segregation, processing, treatment and disposal and take corrective measures.

Chapter 6. Capacity Building and Training

6.1 Training Programme

- The LBs/district administration should impart periodic training programmes, on the Rules, Bye-laws, CPCB guidelines, and any other relevant materials, to all the concerned officials and functionaries to ensure they are aware of the existing rules and regulations of the C&D waste management.
- Various training and awareness modules should be prepared suitable to the government officials of different hierarchy keeping their roles and responsibilities into consideration.
- The training programmes should be focused on maximising productivity and efficiency of the resources available within the UT of Ladakh.
- The UT administration should earmark adequate amounts of training and capacity building of all levels of staff at regular intervals.
- The schedule, frequency and length of the training and capacity building programmes should be dependent on the no. of staffs and other external agencies involved.
- The training programmes should also be conducted to improve the awareness level among the potential market players regarding the utilization of C&D waste products.

6.2 Awareness Programme

- The LB together with concerned Govt agencies, and partner organizations should disseminate information regarding the use and benefits of recycled C&D waste products among various stakeholders including the general public.
- The concerned government agencies must devise strategies to improve awareness and generate demand for C&D waste-based building materials via White papers, workshops, targeted incentives for the first-time users, etc. The ULB should widely publicise the sources from where the recycled products can be procured.

6.3 Visibility Programme

- There should be a provision for separate section on management of C&D waste on the LB's website where the information about C&D waste including rules, policies, user fee, penalties, details of collection centre/transit sites and processing facilities, etc will be available.
- A list of suggestions for waste minimization, recycling, and an interactive section where audio-visuals on useful ideas or experiences can be uploaded and discussed.
- Incentives for use of recycled material should be publicised through the website.
- The LB should use print and audio/visual media to sensitize the citizens about the issues arising out of C&D waste being dumped at empty sites or along with other types of wastes. The numbers around per day generation and the magnitude of the problem should be publicised and cooperation solicited from the citizens in handling the C&D waste responsibly.
- The LB shall collaborate with the technical experts, NGOs and builder/developer associations to build the IEC content and disseminate the information.

Chapter 7. Grievance Redressal Mechanism

For effective functioning of the C&D Waste Management System, a robust grievance redressal system is imperative. Following are the steps to be followed:

- This system creates a platform for various stakeholders to voice their complaints regarding C&D waste disposal and is an additional monitoring mechanism for the LB.
- This system could be enabled through walk-in complaints, phone calls, SMS, online complaints, through postal service and/or any other mechanism which the LB may consider appropriate.
- The LB shall ensure that each grievance is redressed in a timely and efficient manner bearing in mind the type of grievance, inconvenience caused to public and remedial action proposed to be taken.
- The LB officials should make an area wise periodic (daily, weekly or monthly) report of the number and type of complaints received, action taken including time taken, feedback of the complainant and pending complaints.
- This should be submitted to the executive officer of the LB for review and necessary action.
- The details of complaints received, and action taken should also be available on the LB website and its office during working hours.

Chapter 8. Way Forward

The following key activities and milestones shall be taken up for successful implementation and adoption of the policy

Sl. #	Key Activities & Milestones	*Time limit w.e.f. 1st September 2022
1	Notification of the C&D policy after public disclosure	01 months
2	Setting up of all the Committees/Taskforces at the UT and Local Level	02 months
3	Identification of sites for setting up processing, recycling and storage facilities	03 months
4	Engagement of Consultants for preparing DPRs	03 months
5	Notifications for enforcing C&D waste generators to practice scientific handling and management of wastes at source	03 months
6	Procurement of specialized C&D waste collection vehicles, etc.	06 months
7	Commissioning of recycling and storage facilities	06 months
8	Monitoring by UT PCC	4 times in a year-once in 3 months

Annexure-1

PUBLIC NOTICE

MANAGEMENT OF CONSTRUCTION AND DEMOLITION WASTE

NAME OF ULB.....

This is bring to the notice of the public residing in the jurisdiction of (Name of ULB.....) that Construction and Demolition Waste should not be thrown or littered on the roads/public places. In case of generation of Construction and Demolition Waste, the generator should contact online or in writing at the office of (Name of ULB.....) within three days of generation of waste for collection of waste by giving such collection charges as notified by (Name of ULB.....).

After receiving information in writing from the Generator, the ULB shall arrange to lift the C & D waste and dispose it at a designated site by using its own resources or will deploy an agency for the same and shall fill the trip sheet.

It is also brought to the notice of the public that every waste generator shall keep the Construction and Demolition waste within their premises or get the waste deposited at collection centre notified by (Name of ULB.....) or handed over it to the authorized agency and also ensure that there is no littering or deposition of Construction and Demolition waste so as to prevent obstruction to the traffic or the public or drains.

This notice is published in compliance of the provisions of the Construction and Demolition Waste Management Rules, 2016.

Annexure-2

PUBLIC NOTICES REGARDING PENALIZATION OF C&D WASTE

THE ADMINISTRATION OF THE UNION TERRITORY OF LADAKH
OFFICE OF THE EXECUTIVE OFFICER MUNICIPAL COMMITTEE LEH

NOTICE

Instances have come to the notice of undersigned that construction & demolition activities are taking place in various wards of Municipal Committee, Leh and debris/malbas/construction materials are being dumped on roadside, which creates inconvenience to the commuters & general public.

Construction & Demolition wastes stored outside construction sites and along road sides are a cause of both traffic congestion and mishaps. C&D waste is also often dumped in surface drains obstructing the flow of wastewater leading to urban flooding.

In view of the above, it is notified for the information of general public of Leh town that Municipal Committee, Leh shall not allow dumping of any construction & demolition waste on roadside in Leh town area.

Anyone found dumping construction & demolition waste/materials/debris on roadside/footpath in Leh town after 31st March 2022 shall be **penalized with fine of minimum Rs. 20000/- and their materials will be seized.**

Executive Officer,
Municipal Committee,
Leh

No: MCL/2021-22/2702-11 dated: - 29.03.2022

Copy for information to the: -

1. Deputy Commissioner/CEO, LAHDC, Leh for kind information.
2. Director, Urban Local Bodies, Ladakh for kind information.
3. Hon'ble President & All Ward Members, Municipal Committee, Leh.
4. District Superintending Engineer, PWD Circle Leh for information & n/action.
5. Executive Director/General Manager, NHIDCL, Leh for information and n/action.
6. P.S. to Hon'ble Chairman/CEC, LAHDC, Leh for kind information of H'CEC.
7. P.S. to Commissioner Secretary, Housing & Urban Dev. Dept. UT Ladakh for kind information of C/S HUDD.
8. Assistant Director, Information Department, Leh for wide publicity.
9. Editor/RNU, DDK, Leh/News Editor, AIR Leh with the request to disseminate this notice.
10. ADIO, NIC Leh with the request to upload on Leh website.

Annexure-3

Sample Notification

Construction and Demolition (C&D) Waste Management in the Municipal areas in the UT of Ladakh

The Construction and Demolition (C&D) Waste Management Rules, 2016 was notified vide **G.S.R. 317(E) 29th March 2016** by the Ministry of Environment, Forest, and Climate Change (MoEF&CC). As per Rule 3 (c) of the notification, all waste comprising of building materials, debris and rubble resulting from construction, re-modeling, repair, and demolition of any civil structure will be considered as **C&D waste**. Under Rule 3, sub-rule (1)(j), any person or association of persons or institution, residential and commercial establishments including Indian Railways, Airport, Port and Harbor and Defense establishments who undertakes construction of or demolition of any civil structure that generate construction and demolition waste will be considered as **"Waste Generator".** Under Rule 4 sub-rule (3), all waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month will be considered as **bulk C&D waste generators.**

In order to ensure scientific management of C & D Waste and handling and related works in the, the MC Leh/Kargil hereby notifies the following Order that will be effective from ……This Order shall be applicable for all **C&D waste generators (commercial, institutional, non-commercial and bulk)** within the jurisdiction of MC, Leh/ Kargil and shall remain in force until further notification.

A. Advance intimation and planning

1. All bulk and non-bulk C&D waste generator shall be responsible to inform the respective ULB, at least 15 working days in advance, to obtain no-objection certificate (NOC) before commencing any C&D work in the prescribed application format. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR…….**
2. Prior to permitting to start demolition operations of large and multi-storied buildings, an engineering survey of the structures/ buildings/ equipment shall be made, by a competent person, to determine structural integrity and the possibility of unplanned collapse of any portion of the structure/ building/ equipment. Any adjacent structure that may be exposed to any potential damage shall also be similarly checked. **MC will charge a one-time fee of INR XXX for this site inspection and issuance of NOC.**

B. Site management

3. All bulk and non-bulk C&D waste generator shall be responsible to segregate the C&D waste at source/construction site.
4. Upon accumulation of stipulated amount of waste, the generator would inform the ULB or the authorized agencies who shall then send a suitable vehicle to pick up such segregated C&D waste on payment of necessary charges by the said generator.
5. It shall be the responsibility of owner/occupier/generator to ensure that no illegal C&D waste is dumped or thrown indiscriminately. The same can be reported at ULB dedicated helpline number. Non-compliance would attract penalty.
6. It shall be the responsibility of owner/occupier/generator to ensure that no soak pit, drainage channels, water supply lines, power supply lines, tele-communications, sewerage lines, septic tank, common access roads or any other public utility is not affected due to improper storage of C&D waste at site.

7. Adequate lateral support for adjoining structures should be provided. Before the existing lateral support is disturbed, provision should be made for the erection of temporary supports, which will need to be checked for effectiveness as the demolition proceeds. The
8. As per C&D Waste Rules (Rule 4 sub-rule (4)) there should be no littering or deposition of construction and demolition waste by any **waste/bulk C&D waste generators in any of the occupied/unoccupied/open/vacant/public or private place including but not limited to streets/ roads/ sidewalks/ playground/ low lying areas/ drains (nallahs)/ abandoned quarries/ outskirts of the city etc.,** so as to prevent obstruction to the traffic or the public or drains within the limits of Urban Local Body of Leh and Kargil**. If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each offence.**
9. ULB may randomly/periodically verify premises of waste generators. **If any waste generator is found violating this Notification will be liable to pay fine.** The amount of fine will be INR 5000 for building repair and INR 10000 for new construction/demolition of building irrespective of its area.
10. Every violation shall be recorded and ULB shall provide slip to the violators to deposit the fine within seven days of violation. If a violator fails to deposit the fine within stipulated timeframe, then the fine amount plus 10% cumulative interest shall be added for each passing day and recovered.
11. If violation continues, the defaulter can be taken to a civil court as per the Environment Management Act.
12. As per Noise (Regulation & Control) Rules 2000, noise from a C&D waste management facility is considered an environmental nuisance if the construction / demolition activity is conducted outside the stipulated hours (7 am to 9 pm from Monday to Saturday) of operation or on holidays. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each offence.**
13. As per Rule 5A, subrule (3) under Noise (Regulation & Control) Rules 2000, sound emitting construction equipment's shall not be used or operated during nighttime in the residential areas and silence zones. Permissible noise level (in dB(A) Leq which is the equivalent continuous (energy average) level (Aweighted)) for C&D activity in the different zones/areas are (A) Industrial area 75 (B) Commercial area 65 (C) Residential area 55. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each offence.**
14. Dusts from various C&D activities release wide range of particle sizes and material types and can cause both serious health problems. In case of demolition, the building should be covered with non-porous sheets so that dust and falling broken parts do not cause any accident. Debris generated through C&D activity should mandatorily be covered by a non-porous sheet. Visible signboards indicating do's & don'ts, needs to be displayed mandatorily by Bulk C&D waste generator at each site. Fugitive dust emissions suppression systems should be in place at all bulk C&D waste generation sites. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each offence.**

15. Water sprinklers needs to be used for spraying water at all storage and unloading points to prevent fugitive dust emissions. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each offence.**
16. Hazardous C&D wastes/ toxic wastes should be kept separately from C&D wastes to avoid further contamination. Lead, tars, adhesives, sealants, containing asbestos, glasses, sharp metals etc. are classified as hazardous C&D waste. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each offence.**

C. Collection & Transportation

17. The ULB will transport this waste to a designated disposal site/ storage depots/ processing center. The ULB may also authorize selected agencies to collect C&D waste and the details about these organizations may be found at ULB website.
18. C&D waste generators are not required to transport the debris. They need to contact at local helpline of ULB to send a vehicle to pickup such waste on payment of necessary fixed charges decided by ULB. INR 600 a ton (excluding taxes) will be charged for picking up C&D waste from the site for the non-bulk generators and INR 350 will be charged for picking up C&D waste from bulk generator sites as transportation cost.
19. No person/contractor/vehicle owner/authorized agencies are allowed to drive any vehicle filled with C&D waste without prior information to ULB and obtaining stipulated challans. Vehicles carrying C&D waste should be covered to prevent any littering or deposition of waste as well as to prevent fugitive dust emission upon any occupied/unoccupied/open/vacant/public or private place. The motorized vehicles should be fitted with GPS facility to track the movement by such vehicles. **If anyone found prohibiting this Notification, will be liable to pay penalty of INR……. for each incidence of offence. The Authority may also take measure for seizing the vehicle and/or driving license of the driver.**

D. Disposal

20. The ULB, through its website, shall disclose information about the designated disposal sites/ waste storage depots and processing centers.