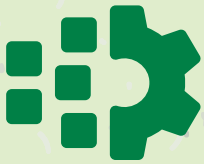
स्वच्छ भारत
एक कदम स्वच्छता की ओर

सत्यमेव जयते
Ministry of Housing and Urban Affairs
Government of India

LiFE
Lifestyle for Environment

INDIA'S CIRCULAR SUTRA

A COMPENDIUM OF GOOD PRACTICES



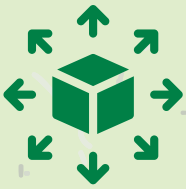
RECYCLING AND RESOURCE RECOVERY

RRR CENTRES

WASTE-TO-WEALTH

WASTE-TO-WONDER

WET WASTE MANAGEMENT



DECENTRALISED WASTE MANAGEMENT

PLASTIC WASTE MANAGEMENT

WASTE-TO-ENERGY & BIOFUELS

LEGACY WASTE MANAGEMENT AND DUMPSITE REMEDIATION

WASTEWATER MANAGEMENT

PUBLIC ENGAGEMENT AND COMMUNITY-BASED INITIATIVES

INNOVATIVE INTERVENTIONS

National Institute of Urban Affairs

TITLE
India's Circular Sutra: A Compendium of Good Practices

PUBLISHER
National Institute of Urban Affairs, Delhi

YEAR OF PUBLISHING
2025

CREDITS
Ms Paramita Datta Dey, Head (Resources And Waste)
Dr Mahreen Matto, Team Lead (SCBP)
Ms Nabamalika Joardar, Head - Communications and Strategy
Ms Priya Upadhyay, Senior Project Associate
Mr Gaurav Verma, Research Associate
Ms Tanya Ahmed, Program Officer
Mr Anant Mitra, Program Officer
Ms Garima Agarwal, Program Assistant
Ms Tanya Singh, Communications Associate
Ms Faiza Hazarika, Communications Associate
Ms Aishwarya Bali, Junior Program Associate
Ms Mani Chauhan, Climate Intern

GRAPHIC DESIGN
Design Team NIUA

DISCLAIMER
This document is intended as a compendium of Circular Economy Practices in India to help ULBs to develop capacity and awareness regarding the good practices in the field of Circular Economy and Sustainable Practices. While every effort has been made to ensure the correctness of data and information used in this document, neither the authors nor NIUA accept any legal liability for the accuracy or inferences drawn from the material contained therein or for any consequences arising from the use of this material. No part of this document may be reproduced in any form (electronic or mechanical) without prior permission from or intimation to NIUA.

THE FULL REPORT SHOULD BE REFERENCED AS FOLLOWS
NIUA (2025) "India's Circular Sutra: A Compendium of Good Practices" Delhi, India

Text from this document can be quoted provided the source is acknowledged.

स्वच्छ भारत
एक कदम स्वच्छता की ओर

सत्यमेव जयते
Ministry of Housing and Urban Affairs
Government of India

LiFE
Lifestyle for Environment

INDIA'S CIRCULAR SUTRA

A COMPENDIUM OF GOOD PRACTICES

National Institute of Urban Affairs

"The mantra of 3R – Reduce, Reuse and Recycle - is at the heart of any vision towards the sustainable development of mankind. All stakeholders – producers, consumers, and the State alike - must adhere to this golden principle which can contribute significantly in solving the twin challenges of waste management as well as sustainable development."

Eight Regional 3R Forum, 2018

Shri Narendra Modi

Hon'ble Prime Minister of India

Message

Shri Manohar Lal
Hon'ble Minister of Housing
And Urban Affairs

तोखन साहू
TOKHAN SAHU

आवासन और शहरी कार्य राज्य मंत्री
भारत सरकार
Minister of State for Housing & Urban Affairs
Government of India

MESSAGE

The principles of the circular economy are pivotal to achieving environmental sustainability, economic resilience, and social well-being. As India faces with the twin challenges of climate change and resource depletion, it is imperative that we shift towards more sustainable patterns of production and consumption. The 12th Regional 3R and Circular Economy Forum in Asia-Pacific serves as a platform to accelerate this transition, fostering dialogue and cooperation among nations, industries, and communities.

The Asia-Pacific region, home to a significant proportion of the global population, must take the lead in implementing circular economy strategies. Given its rapid economic growth, the region faces immense pressure on its natural resources. By adopting a circular approach, we can mitigate these pressures while ensuring sustainable development. India's leadership in this transition is reflected in the integration of circular economy principles across key sectors, including waste management, energy, agriculture, and manufacturing.

The Government of India has undertaken transformative measures, including the formulation of a Circular Economy Roadmap covering critical sectors such as electronic waste, plastic waste, and industrial waste. Through cross-sectoral coordination and collaboration, we aim to enhance resource efficiency, reduce environmental impact, and promote low-carbon growth. The circular economy framework aligns seamlessly with our vision of Atmanirbhar Bharat, encouraging innovation, green jobs, and economic competitiveness.

This case study compendium serves as a testament to India's diverse and innovative approaches to circular economy implementation. By documenting over 100 successful case studies from different states and regions, this compendium offers a rich repository of good practices that can be scaled and replicated.

As we work towards realising a zero-waste, low-carbon future, let us reaffirm our dedication to responsible consumption, sustainable production, and environmental stewardship. I extend my warmest regards to all participants and look forward to the transformative impact that this forum will generate in the years to come.

(Tokhan Sahu)

New Delhi.
February, 2025

श्रीनिवास कटिकिथाला, भा.प्र.से.
सचिव
Srinivas Katikithala, I.A.S.
Secretary

भारत सरकार
आवासन और शहरी कार्य मंत्रालय
निर्माण भवन, नई दिल्ली–110011
Government of India
Ministry of Housing and Urban Affairs
Nirman Bhawan, New Delhi-110011

Foreword

The 12th Regional 3R and Circular Economy Forum in Asia-Pacific reaffirms the urgent need to rethink our production and consumption patterns in the face of global environmental challenges. A transition to circular economies is not just an environmental imperative but also an economic and social necessity. By adopting circular economy principles, we can create systems that not only reduce waste and pollution but also generate economic opportunities and enhance resilience.

India is committed to leading by example in this transition. The development of sectoral circular economy roadmaps, integration of sustainability considerations into industrial policies, and implementation of waste-to-value initiatives are steps towards a more resource-efficient future. At the same time, the emphasis on community participation and behavioural change ensures that these transitions are inclusive and equitable.

The challenges of resource depletion and waste management are shared by all countries, and their solutions must also be collaborative. Through shared knowledge, innovative technologies, and strategic partnerships, we can collectively drive the agenda for circular economies in the Asia-Pacific region.

This case study compendium highlights practical, community-driven solutions that have successfully addressed challenges in waste management, urban sustainability, and resource optimization. By showcasing scalable and replicable models, this compendium provides a valuable repository of knowledge, enabling decision-makers to accelerate the adoption of circular economy principles at local, national, and international levels.

This publication reaffirms India's commitment to sustainable development and reinforce the collaborative spirit required to drive the circular economy agenda forward. It is our hope that they will inspire further innovation, policy advancements, and strategic partnerships in the pursuit of a cleaner, more resilient future.

The commitment to circularity is a commitment to future generations, ensuring that we leave behind a planet that is abundant in resources, clean, and thriving. I look forward to the impactful discussions and meaningful collaborations that will emerge from this important gathering.

(SRINIVAS KATIKITHALA)

Place : New Delhi
Dated : 27th February, 2025

Preface

Smt Roopa Mishra
Joint Secretary and Mission Director,
SBM-U, Ministry of Housing and Urban Affairs

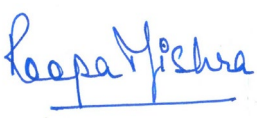
The journey towards a circular economy is a defining challenge of our time, requiring comprehensive policy interventions, technological innovations, and stakeholder engagement. The 12th Regional 3R and Circular Economy Forum in Asia-Pacific is a testament to the collective resolve of governments, businesses, and civil society to advance sustainable development. The imperative to transition towards circular societies is stronger than ever, given the growing concerns surrounding resource scarcity, waste generation, and climate change.

India has been proactive in embedding circular economy principles into its developmental agenda. The Swachh Bharat Mission, the Extended Producer Responsibility framework, and the Circular Economy Roadmap are key initiatives that underline our commitment to sustainability. The approach is not just about waste management but about rethinking the entire lifecycle of materials and products. By fostering innovation, encouraging responsible consumption, and incentivising recycling, we can create an economic model that minimises waste and maximises value.

The role of cities in this transition cannot be overstated. Urban areas are hubs of consumption and economic activity, making them critical actors in the circular economy transformation. Policies that encourage sustainable urban infrastructure, resource-efficient industries, and community-driven initiatives are essential to realising a resilient and environmentally responsible future.

This case study compendium highlights good practices from across India, showcasing innovative and scalable solutions in waste management, resource conservation, and sustainable urban development. These real-world examples serve as inspiration for policymakers, urban planners, and industry leaders to replicate and adapt proven models in their respective domains. This knowledge-sharing effort strengthens India's leadership in advancing the circular economy agenda, ensuring that progress is both inclusive and impactful.

Let us seize this moment to build a sustainable, circular future—one that safeguards our natural resources, mitigates climate risks, and ensures prosperity for generations to come.



Acknowledgement

The 12th Regional 3R and Circular Economy Forum in Asia-Pacific reaffirms the urgent need to rethink our production and consumption patterns in the face of global environmental challenges. This compendium on "India's Circular Sutra: A Compendium of Good Practices", aligns with the Forum's objectives by showcasing India's commitment to circular economy principles and sustainable waste management practices.

The document is the result of dedicated efforts from the Ministry of Housing and Urban Affairs, Ministry of Food Processing Industries, Department of Drinking Water and Sanitation, State Governments, urban local bodies (ULBs), and individuals, all of whom have played a pivotal role in shaping the Circular Economy landscape in India.

I extend my sincere gratitude to Shri Manohar Lal Khattar, Hon'ble Minister of Housing and Urban Affairs, whose visionary leadership has been instrumental in guiding this initiative. His steadfast commitment to the principles of the Circular Economy continues to inspire urban India.

A special thanks to Shri Srinivas Katikithala, Secretary, Ministry of Housing and Urban Affairs, for his strategic direction and constant encouragement. His support has been pivotal in steering the mission towards new heights and ensuring that cities across the country strive to meet their waste management goals in alignment with regional and global 3R objectives.

I am also deeply grateful to Ms. Roopa Mishra, Joint Secretary and Mission Director, Ministry of Housing and Urban Affairs, for her leadership and invaluable contributions to the documentation process. Her role has been instrumental in ensuring that the document reflects the latest advancements in circular economy practices across India.

I also appreciate the contribution of officials from the various allied Ministries and line departments, State Governments and Union Territories whose contribution has been vital to the development of this document. Their collective efforts have been integral in fostering a sustainable waste management ecosystem in India.

My sincere thanks to all the cities that have contributed to and supported this initiative. Their efforts continue to serve as a beacon of progress and innovation in the waste management sector, inspiring others toward sustainable solutions.

Last but not the least, I thank the team at the National Institute of Urban Affairs, led by Ms Paramita Datta Dey and Dr Mahreen Matto in bringing out this Compendium.

I hope that this document serves as a valuable resource for local bodies across nations, aiding them in their continued journey toward 3R and Circular Economy principles as emphasized by the 12th Regional 3R and Circular Economy Forum in Asia-Pacific.

Debolina Kundu

Dr Debolina Kundu
Director
National Institute of Urban Affairs

Abbreviations

3Rs	Reduce, Reuse, and Recycle
ALF	Area Level Federation
AMC	Aizawl Municipal Corporation
APEMCL	AP Environment Management Corporation Limited
APGENCO	Andhra Pradesh Power Generation Corporation
APIs	Active Pharmaceutical Ingredients
APPCB	Andhra Pradesh Pollution Control Board
ASULMS	Assam State Urban Livelihoods Mission
ATS	Automated Testing Stations
BPCL	Bharat Petroleum Corporation Ltd.
BSF	Black Soldier Fly
BWGs	Bulk Waste Generators
C&D	Construction and Demolition
CAPEX	Capital Expenditure
CBG	Compressed Bio Gas
CEE	Centre for Environment Education
CMWSSB	Chennai Metropolitan Water Supply and Sewerage Board
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
COD	Certificate of Deposit
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
CV	Calorific Value
D2D	Door-to-Door Collection
DAY-NULM	Deendayal Antyodaya Yojana-National Urban Livelihoods Mission
DEMS	Department of Environment Management Services
DLFMCs	District Level Facilitation and Monitoring Committees
DRS	Deposit Refund System
ELV	End-of-Life Vehicle
EV	Electric Vehicle
FCTP	Fixed Compactor Transfer Point
FPC	Farmer Producer Company
FSTP	Faecal Sludge Treatment Plant
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (Germany)
GST	Goods and Services Tax
GWMC	Goa Waste Management Corporation
HAM	Hybrid Annuity Model

HDPE	High-Density Polyethylene
HKS	Haritha Karma Sena
INR	Indian Rupee
IVL	Swedish Environmental Research Institute
JNAC	Jamshedpur Notified Area Committee
kg	Kilogram
KILA	Kerala Institute of Local Administration
kW	Kilowatt
LAD	Local Administration Department
LAHDC	Ladakh Autonomous Hill Development Council
LLP	Limited Liability Partnership
LSGD	Local Self Government Department
LSGI	Local Self Government Institution
LWM	Liquid Waste Management
MCCs	Micro-Composting Centres
MCFs	Material Collection Facilities
MIDC	Maharashtra Industrial Development Corporation
MLD	Million Liters per Day
MLP	Multi-Layered Plastic
MoEF&CC	Ministry of Environment, Forest and Climate Change
MOFPI	Ministry of Food Processing Industries
MoHUA	Ministry of Housing and Urban Affairs
MoPNG	Ministry of Petroleum & Natural Gas
MOU	Memorandum of Understanding
MPCB	Maharashtra Pollution Control Board
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
MT	Metric Ton
MTA	Metric Tons per Annum
MW	Megawatt
NDMC	New Delhi Municipal Council
NGO	Non-Governmental Organization
NIUA	National Institute of Urban Affairs
NMMC	Navi Mumbai Municipal Corporation
NULM	National Urban Livelihoods Mission
O&M	Operation and Maintenance
OPEX	Operational Expenditure
PBAT	Polybutylene Adipate Terephthalate
PCMC	Pimpri-Chinchwad Municipal Corporation
PCTS	Primary Collection & Transfer Stations
PCTW	Post-Consumer Textile Waste
PET	Polyethylene Terephthalate

PMC	Patna Municipal Corporation
PMJJBY	Pradhan Mantri Jeevan Jyoti Bima Yojana
PMSBY	Pradhan Mantri Suraksha Bima Yojana
PPE	Personal Protective Equipment
PPP	Public-Private Partnership
PSU	Public Sector Undertaking
PUC	Pollution Under Control Certificate
RDF	Refuse-Derived Fuel
RIICO	Rajasthan State Industrial Development and Investment Corporation
RVSF	Regional Vehicle Scrapping Facilities
RWAs	Residential Welfare Associations
SAF	Sustainable Alternate Fuel
SATAT	Sustainable Alternative Towards Affordable Transportation
SBM	Swachh Bharat Mission
SHG	Self-Help Group
SINTEF	Foundation for Industrial and Technical Research (Norway)
SOPs	Standard Operating Procedures
sq. km	Square Kilometer
STP	Sewage Treatment Plant
SUP	Single-Use Plastics
SVPMC	Sri Vijaya Puram Municipal Council
TMC	Thane Municipal Corporation
TPD	Tons Per Day
TRF	Textile Recovery Facility
TSTP	Tertiary Sewerage Treatment Plant
TTPs	Tertiary Treatment Plants
TTRO	Tertiary Treatment Reverse Osmosis
TTUF	Tertiary Treatment Ultrafiltration Plant
ULBs	Urban Local Bodies
UMC	Ujjain Municipal Corporation
UN SDG	United Nations Sustainable Development Goals
WTE	Waste-to-Energy
ZWC	Zero Waste Circular Solution

Themes


Circular Economy


Electronic Waste


End -of-Life Vehicle


Municipal Liquid Waste


Municipal Solid Waste

Scrap Metal


Solar Panels


Textile


Toxic and Hazardous Industrial Waste


Tyre and Rubber Recycling

CONTENTS

Recycling & Resource Recovery 2

Sustainable Crafts: Assam's SHG Women Weave Success from Water Hyacinth 3
Coconut Waste Recycling: Bhopal's Waste Minimizing Strategy 4
Reviving Lives and Resources: The Story of 'Project Revitalization' in Thane 5
A Sustainable Approach to Marine Conservation: Andaman & Nicobar's Approach to Marine Gear Management 6
Tech Trash to Treasure: Refurbishing Waste in Alwar 7
Jammu's Material Recycling Centre: A One-Stop Solution 8
Cloth to Paper Recycling: Ujjain's Sustainable Circular Economy Initiative 9
Jammu & Kashmir's Waste Management: A Collaborative Pathway 10
Tirupati's Solar Shift: Giving Old Panels A New Life 11
Turning Trash into Treasure: Gangtok's E-Waste Management Initiative 12
Converting Waste into Value: Solid Waste Management in Shopian 13
Transforming Urban Waste Management: A Case Study of Ghaziabad 14
West Bengal's Sustainable Revolution: Innovating SWM for a Better Future 15
Chattisgarh's E-Waste Management: Responsibly Disposing Waste 16
Sagar's C&D Waste: A Valuable Resource 17
Jiribam's Green Initiative: Upcycling Old Freezer and Glass Ware 18
Integrated Resource Recovery Park: Jaipur's Waste-to-Resource Initiative 19
Puducherry's Integrated Solid Waste Process: Yields Sustainable Resource Recovery 20
Sustainable Waste Solutions: Mangan Nagar Panchayat's Multi-Pronged Approach 21

RRR Centres 22

Waste-to-Wealth Hubs: Baramulla's RRR Centres 23
Giving A New Home for Old and Unused Goods: Jamnagar RRR Centers 24
Adding the 4th R to RRR: Chandigarh's One Rupee Store 25
Effective Waste Recycling Hub: Jharkhand's RRR Centre 26
Reviving Resources: Gangtok's RRR Centre Tackles Textile Waste 27
Empowering Jamshedpur Women: The SHS Group's RRR Model 28
Reduce, Reuse, Recycle: Jharkhand's Initiative for Waste Management 29

Waste-to-wealth 30

Belagavi's Floral Waste: Karnataka's Waste-to-Wealth Opportunity 31
Bricks Out Of Coconut Shell Waste: Karnataka's Chittapura Approach 32
Ujjain's Floral Alchemy: From Temple Waste To Incense And Empowerment 33
Odisha Floral SHG's: Turning Waste to Valuable Products 34
From Coconut Shell to Coir: Jharkhand's SHG Initiative 35
Wat A Scrap': Transforming Leftover Fabrics Into Functional Products 36
Harnessing Horticulture Waste: Ghaziabad's Biochar & Wood Vinegar Revolution 37
Transforming Old Buses into: Patna's Mobile Pink Toilets 38
Leh's Art: Repurposing Industrial Scrap Metals 39
Bricks from Bottles: Dharmanagar's Innovative Glass Recycling Initiative 40
Creating A Circular Loop: Jammu And Kashmir Tackles Organic Waste 41
The COCO Approach: Udaipur's Waste Management Initiative 42

Waste-to-wonder 43

Waste to Art Project: How UP Darshan Park Champions Circular Economy 44
Musical Square: Refurbishing Ghaziabad's Scrap Waste 45
Delhi's Bharat Darshan Park: Transforming Scrap into Artistic Wonders 46
Studio Kilab's Sustainable Craft Innovation in Srinagar 47
Prayagraj's Shivalaya Park: A Heritage Reimagined 48
Punjab's Recyclable Cafe: A Waste-to-Wonder Business Model 49
Sculpting a Sustainable Future: The 3R Initiative by Sabroom Nagar Panchayat 50

Wet Waste Management 51

Aizawl's Home Compost: An Economic Intervention 52
Wet Waste Management: Srinagar's Weed Processing Plant 53
Waste to Compost: Qazigund's Sustainability Journey 54
Poultry Waste Management: Kerala's Rendering Plants 55
Leaf to Life: Kota's Sustainable Composting Initiative 56
Wet Waste Innovation: Jharkhand's Sustainable Waste Management 57
On-site Waste Composting: Jharkhand's Organic Waste Management 58
City Farmers Partnership Programme: Chikkaballapura Tackles Wet Waste 59
Mo Khata': Odisha Tackles Organic Waste 60
Worms at work: Assam Tackles Waste Through Vermicomposting 61
Turning Waste into Silicone-Rich Granules: The Dewas Way 62

Decentralised Waste Management 63

Keeping Lucknow Clean: The Impact of Door-to-Door Waste Collection & Recycling 64
Zero Waste, Maximum Impact: Decentralized Waste Processing for a Greener Jaipur 65
Waste-free communities: How Navi Mumbai's transforming slums 66
A Resource in Disguise: Nagar Nigam Gorakhpur's Circular Economy Insights 67
Door-to-Door Initiative: Riding Towards Pushkar's Cleanliness 68

Plastic Waste Management 69

Eco-Friendly Festival Celebrations: Andaman & Nicobar's Plastic And Waste Reduction Method 70
Andaman & Nicobar's Plastic Waste Reduction: A Milk Pouch Buy-Back Scheme 71

Effective Plastic Waste Management: Baramulla's Story 72
Closing the Loop: Implementing Circular Economy Best Practices in Aibawk 73
Plastic Waste Management in Char Dham: A Digital Deposit Refund System 74
Haryana's Vending Machines: Combatting Plastic Waste 75
Bagging a Greener Future: Kamalpur's Eco-Friendly Alternative to Plastic 76
Turning Plastic Waste into Public Assets: Itarsi's Circular Economy Model 77
Eliminating Single-Use Plastic: Chhattisgarh's 3 Innovative Approaches 78
Tackling Multi-Layer Plastics: Punjab's Plastic to Chipboard Scheme 79
SUP-free Farmers Markets: Trichy's IEC Efforts Thrive 80

Waste-to-Energy & Biofuels 81

Guntur's Power Play: Transforming Waste Into Clean Energy 82
Tirupati's Green Revolution: Turning Organic Waste Into Bio-CNG 83
Karnataka's Waste-To-Energy Approach: A Biomethanation Plant 84
Producing Energy from Waste: Karnataka's GOBARdhan initiative 85
Indore's BioCNG Breakthrough: Turning Wet Waste into Green Fuel 86
Rewa's Energy Makeover: Converting Trash Into Treasure 87
Powering Cities with Waste: Jabalpur's 600 TPD Waste-to-Energy Success 88
Pune's Green Energy Hub: From Food Waste to Fuel 89
Turning Waste into Watts: Pimpri-Chinchwad's Waste-to-Energy Transformation 90
Fuelling Growth: The Economic and Environmental Benefits of Jaipur's Biogas Project 91
From Waste to Fuel: Rajasthan Goes Green 92
Gwalior Tackles Cattle Dung: 100 TPD at a time 93
Transforming Bihar through GOBARdhan Yojana: A Sustainable Approach 94
Alternate Fuel for Alternate Future: Chittorgarh's Journey 95
Scaling Sustainability: Bringing Jaipur's Circular Economy Vision to More Cities 96

Legacy Waste Management & Dumpsite Remediation 97

Reclaiming Dumpsites: Goa's Waste Management Initiatives 98
Puducherry Legacy Waste Remediation: 16.90 acres of Land Reclaimed 99
From Dumpsite to Green Space: A Model for Uttarakhand's Waste Management 100
Lucknow's Green Energy: Fresh Waste Processing & Legacy Waste Remediation 101
Greening Barren Lands: Rajkot's Circular Approach 102
Reclaiming Garbage Vulnerable Points: Ghaziabad's Green Initiative 103
From Dumpsite to Modern Facility: Tangmarg-Gulmarg Redefining Waste Management 104

Wastewater Management 105

Visakhapatnam's Liquid Gold: Recycling Wastewater for a Sustainable Future 106
Zero Discharge, Maximum Impact – Navi Mumbai's Water Reuse Success 107
Recycling Waste Water to Recharge Porur Lake: Chennai Paves the Way 108
Ghaziabad's TSTP Project – Advancing Wastewater Reuse for Sustainable Urban Development 109
Rejuvenating Wastewater: Karad Finds A New Resource 110
Promoting Improved Sanitation: Warangal's Circular Economy Approach 111
Sustainable Sanitation: Promoting Safe FSSM Practices in Telangana 112

Public Participation & Community-Based Initiatives 113

Patna's Pink Material Recovery Facility: Empowering Women Through Employment 114
The Baini Sena Initiative: Women-Led Waste Management in Uttarakhand 115
Promoting Sustainable Travel for All: Haryana Opts for Green Messaging 116
Bags of Change: Chattisgarh Women Tackling Plastic Pollution 117
Delhi's Zero-Waste Circular Bank: Engaging Students in Sustainable Waste Management 118
Interschool Recycling Championship: Promoting Circular Economy in Delhi 119
Delhi's Zero Waste Colony: A Community-Driven Waste Management Initiative 120
The "Compost Wise" Campaign: Home Composting in Kulgam 121
Haritha Karma Sena: Women Recyclers of Kerala 122
Odisha's Decentralised Waste Management: An Apparatus for Community Engagement 123

Innovative interventions 124

The Journey of Old Clothes: Navi Mumbai is Giving Textile Waste a New Life 125
Promoting Sustainable Vehicle Disposal: Gujarat's End-of-Life Vehicle Plan 126
Double Chambered Incinerator: Treating Sanitary Waste in Thrissur 127
Solar Powered Cleanup: Leh's Bright Solution to Waste 128
Healing the Planet: Thane's Green Pharmacy 129
Rajasthan's Pyrolysis Push: Transforming Tyres to Renewable Energy 130
The Black Soldier Fly: Mangalore's Composting Technology 131
Smart Waste Management: How Lucknow is Leading in Carcass Recycling 132
Innovative Circularity in Ghaziabad: Transforming Waste Through Sustainable Practices 133
Introducing 'Swachhta Ambulance': Meerut's Efficient Waste Management 134
Bio-Enzymes for People, Planet and Profits: Innovation in Orohalli 135
Sustainable Alternative to Single-Use Plastics 137
Integrating Circular Solutions: Tetra Pak's Sustainability Journey 138
Advanced Recycling and Sustainable Packing Innovations 139
Waste to Wealth; Innovative Practices By Sahyadri Farms 140

RECYCLING AND RESOURCE RECOVERY

The notion of reduce, reuse, and recycle (3Rs) is not recent. For decades, sustainability has been inextricably linked with the practice of the 3Rs. However, it is only recently that this practice is being considered as a 'principle' - the sole proven way to mitigate and manage waste from its source itself. Reducing, reusing, and recycling waste is a popular concept amongst citizens who are now driving the zero-waste ecosystem. Recyclers, Self Help Groups, and entrepreneurs are not just contributing to a circular economy by recycling waste and developing a host of products, but also joining forces to create a sustainable urban India. In the fight against climate change, it is imperative to adopt the 3Rs into our lifestyle. The Hon'ble Prime Minister Shri Narendra Modi's Mission LiFE (Lifestyle for Environment) nudges individual and collective action towards the same. Mission LiFE aims to protect and preserve the environment and bring about pro-planet behavioural change that can be instilled through individual action in day-to-day life.

Sustainable Crafts: Assam's SHG Women Weave Success from Water Hyacinth

State/UT	Assam
Urban Local Body	Nagaon Municipal Board
Department/ Organisation	Lakhyajyoti SHG
Duration	2016-Ongoing

Introduction

The Lakhyajyoti Self-Help Group (SHG), formed in July 2016, comprises 10 urban poor women from Ward No. 08, Amolaptty, In August, the group registered under the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM), which set the foundation for significant change. Through training and support, the SHG transformed water hyacinth, a pervasive aquatic plant, into a source of livelihood by creating eco-friendly products such as bags, mats, baskets, and decorative items.

Activities

Post-registration, the SHG received training on management and book-keeping. Following the successful completion of the grading process, they received a revolving fund of INR 10,000 from DAY-NULM and an additional INR 15,000 from the Government of Assam. The Assam State Urban Livelihoods Mission (ASULMS) identified water hyacinth as a viable opportunity due to its abundance in the water-logged areas of Nagaon. The SHG members participated in two seven-day training sessions on utilising water hyacinth to create value-added products such as bags, mats, baskets, and decorative items, selling them through local centers and online platforms such as Flipkart.

Integration with Circular Economy

This initiative contributes to circular economy by transforming an invasive species into useful products, thereby reducing environmental harm. By harvesting and processing water hyacinth, the SHG not only addresses waste management but also contributes to resource efficiency and sustainable livelihoods.

Replicability and Scalability

The success of this initiative in Nagaon indicates its potential for replication in other regions with abundant water hyacinth. By providing necessary training, financial support, and market access, similar SHGs in different parts of India and globally could adopt this model.

Impact

- The initiative helps mitigate the ecological impact of water hyacinth, which is known to disrupt aquatic ecosystems and hinder water flow. The removal of water hyacinth from local water bodies helps in restoring ecological balance.
- The initiative has significantly improved the socio-economic status of the SHG members. They now earn between INR 10,000 to INR 15,000 per month, which has uplifted their living standards.

To know more

Contact

Pankaj Kumar Bhuyan
Executive Officer,
Nagaon Municipal Board
nagaonmunix14@gmail.com

Coconut Waste Recycling: Bhopal's Waste Minimizing Strategy

Introduction

The Coconut Waste Recycling Project by Nagar Nigam Bhopal, aims to process and recycle coconut shells and husks into valuable products like coco peat, while creating a revenue-generating model of annual revenue of INR 1,32,000. The initiative focuses on establishing a facility to process 3 tons per day of coconut waste. The coconut waste recycling project involves multiple stakeholders, including coconut farmers and suppliers and local communities, Government and regulatory bodies and investors and project financiers.

Activities

The project involves several key activities including sourcing raw materials, such as coconut shells and husks, then transported to the recycling plant. The collected waste undergoes processing through washing, drying, and shredding, where husks are converted into coco peat and shells into coir fiber for various applications like ropes, mats, and brushes. The processed coco peat is then packaged into different forms, such as loose peat, blocks, and discs, suitable for nurseries and gardening, while coir fiber is prepared for industrial use. Quality control measures ensure that coco peat and other by-products meet market standards before distribution to nurseries, agricultural enterprises, and gardening outlets.

Integration with Circular Economy

This project embodies the principles of a circular economy by transforming coconut shells and husks waste into valuable products. Through recycling, the project helps close the loop in the coconut supply chain, reducing the need for new resources and minimizing environmental impact.

Replicability and Scalability

This project can be replicated in other regions with high coconut production but limited waste management solutions. By establishing similar recycling plants, local economies can benefit from new revenue streams, while environmental sustainability is achieved through waste reduction and resource conservation.

State/UT	Madhya Pradesh
Urban Local Body	Nagar Nigam Bhopal
Department/ Organisation	Nagar Nigam Bhopal
Duration	Started with BMC as PPP model from 2nd October 2024

Impact

- By recycling coconut waste, the project reduces the need for other growing mediums such as peat moss, which are often sourced unsustainably.
- The project diverts approximately 3 tons of coconut waste per day from landfills, reducing the environmental burden caused by unmanaged waste disposal.
- Coco peat retains water effectively, improving soil moisture retention in agriculture and reducing the need for excessive irrigation.

To know more

Contact

Harendra Narayan
Commissioner
Bhopal Municipal Corporation
commbhopal@mpurban.gov.in

Reviving Lives and Resources: The Story of 'Project Revitalization' in Thane

Introduction

Project Revitalization in Thane addresses the challenge of mounting municipal waste and its adverse environmental impact. The initiative also empowered marginalised rag picker women by integrating them into a circular economy model. The project focuses on resource recovery, upcycling, and sustainable waste management, reducing landfill burden while enhancing livelihoods and public participation.

Activities

The project operates through a structured process that begins with organised waste collection across households, commercial spaces, and public areas. Collected waste is then transported to resource recovery facilities, where trained women workers segregate recyclables from non-recyclables.

Following segregation, the initiative employs upcycling techniques to transform waste into valuable products, ranging from household items to artistic creations. Items that cannot be upcycled are processed for recycling, ensuring that the waste remains within the economic cycle instead of contributing to landfill pollution. A distinctive feature of this initiative is its direct involvement of rag picker women, who previously worked under hazardous conditions but now operate in a safe and structured environment, receiving better wages, financial support, and social welfare benefits.

Integration with Circular Economy

Green waste is converted into fuel briquettes, while flower waste is processed into organic manure. The initiative refurbishes discarded furniture, books, and household appliances. Specialised centers like the Waste Wonder Gallery and Book Library showcase repurposed materials, extending product life cycles and minimising waste generation.

Replicability and Scalability

The initiative's success in Thane demonstrates that through structured waste collection, resource recovery, and stakeholder involvement, sustainable models can be developed. To scale up, expanding infrastructure, increasing workforce training, and forging public-private partnerships are key.

State/UT	Maharashtra
Urban Local Body	Thane Municipal Corporation
Department/ Organisation	Solid Waste Management Department, Environment Department & NGO Samarth Bharat Vyaspeeth
Duration	2017-Ongoing

Impact

- By diverting waste from landfills, the project reduces pollution, conserves natural resources, and minimises greenhouse gas emissions.
- The initiative fosters social inclusion by improving the dignity and financial stability of rag picker women.
- Women waste collectors have seen their monthly income rise from INR 10,000 to INR 12,000–INR 15,000, supplemented by health check-ups, grocery provisions, and children's education support. After three years, the project has reached a financial breakeven point, generating around INR 2,50,000 per month, demonstrating economic viability.

To know more

Contact

Dr. Rani Shinde
Health Officer, Nodal Officer for SBM(U),
SWM Department, Thane Municipal Corporation
hoswm@thanecity.gov.in

A Sustainable Approach to Marine Conservation: Andaman & Nicobar's Approach to Marine Gear Management

State/UT	Andaman & Nicobar Islands
Urban Local Body	Sri Vijaya Puram Municipal Council (SVPMC)
Department/ Organisation	Sri Vijaya Puram Municipal Council (Formerly Port Blair Municipal Council)
Duration	Ongoing

Introduction

To address the growing issue of ghost nets and abandoned fishing gear polluting coastal waters, a dedicated initiative was launched to systematically collect, recycle, and repurpose discarded fishing nets and gear, ensuring a structured approach to marine conservation.

Activities

A dedicated ghost-net collection centre was set up at a fish landing jetty, providing a central point for fishermen to deposit abandoned fishing gear and nets. Regular clean-up drives were conducted in partnership with the local fishermen, the Fisheries Department, and tourism agencies, to retrieve ghost nets from the sea and coastal surroundings.

Awareness campaigns and training sessions were organised to educate stakeholders on the environmental impact of ghost nets and the importance of responsible disposal. These efforts aimed to foster long-term behavioral change among the fishing community and other key players. The collected ghost nets were either recycled or refurbished into value-added products, which were then supplied to vendors, promoting both environmental sustainability and economic benefits.

Integration with Circular Economy

A key aspect of the initiative was refurbishing and recycling of disposed ghost nets and other abandoned marine equipment into everyday-use products. This approach minimized environmental damage and provided an opportunity to generate revenue from repurposed materials, reinforcing the concept of sustainability and circularity.

Replicability and Scalability

The model holds potential for replication in other coastal and island regions facing similar challenges. It can be scaled up by establishing additional collection centres, integrating with regional marine conservation programs, and adopting advanced recycling technologies.

Impact

- Reduced marine litter and mitigation of navigation hazards caused by abandoned fishing gear.
- Preservation of marine ecosystems and biodiversity, ensuring long-term environmental health.
- Generation of local employment opportunities and revenue stream through the sale of recycled products.

To know more

Contact

P Umamaheswara Rao
Junior Engineer,
Sri Vijaya Puram Municipal Council
uma.rao1679@gmail.com

Tech Trash to Treasure: Refurbishing Waste in Alwar

Introduction

The initiative focuses on integrated e-waste management, recovery of critical metals, and minimizing environmental impact through a circular economy approach. The project aligns with the Aatma Nirbhar Bharat mission by reducing dependency on imported metals like copper, tin, gold, and silver while ensuring a sustainable and environmentally friendly recycling process. The initiative involves key stakeholders such as the Rajasthan State Pollution Control Board, Central Pollution Control Board, The Ministry of Environment, Forests and Climate Change (MoEF&CC), and the Ministry of Electronics and IT, along with other key players in the sector.

Activities

An end-to-end integrated recycling facility with a capacity of 68,494 MTA and a refurbishing facility of 5,000 MTA has been established to ensure sustainable e-waste management. It actively collects waste from aggregators, bulk consumers, e-retailers, and the informal sector, bringing them under GST compliance. To facilitate safe transportation of e-waste, the company has partnered with transporters and provides them with environmental safety training. Additionally, it engages with the informal sector, offering skill development programs. The company adheres to high environmental and safety standards, holding certifications such as ISO 9001, 14001, 45001, and R2.

Integration with Circular Economy

The initiative is aligned with circular economy principles by processing e-waste, recycling plastic waste, and refurbishing IT assets, thereby converting waste into valuable resources. The initiative follows a zero landfill policy, ensuring that waste materials are recovered and reused effectively. Additionally, carbon capture is integrated into operations.

Replicability and Scalability

The initiative has significant potential for replication across other states with the right support mechanisms. The initiative advocates for Capex incentives and viability gap funding by the state to encourage investment in recycling infrastructure. Additionally, developing city-based e-waste collection clusters will enhance waste traceability and ensure efficient transportation to recycling facilities.

State/UT	Rajasthan
Department/ Organisation	Rajasthan State Pollution Control Board (RSPCB) Greenscape Eco Management Pvt. Ltd , MIA , Alwar , Rajasthan

Impact

- The initiative focuses on minimizing or eliminating landfill waste by skilling the informal sector and ensuring sustainable waste management practices.
- It accepts e-waste from bulk consumers, the informal sector, and producers while complying with collection, transportation, processing, and recycling norms. Additionally, its recycling facility requires negligible water, except for plastic recycling, and treats wastewater through ETP for reuse, contributing to a cleaner environment.
- Over the last three years, the company has recycled 68,620.238 MT of e-waste and captured 82,344.29 MT of carbon dioxide. In the past ten years, it has recovered 65 kg of gold through PCB processing (export).

To know more

Contact

Bal Gopal Nigam
Operation , G.M Operations
balgopal@greenscape-eco.com

Jammu's Material Recycling Centre: A One-Stop Solution

Introduction

A collaborative effort between the Jammu Municipal Corporation (JMC) and the Centre for Environment Education (CEE), with financial backing from HDFC Bank, was formalised in 2022 to establish a sustainable and circular model. This initiative led to the creation of the Swachh Centre, which uniquely converges a Material Recovery Facility (MRF) and a Material Recycling Centre (MRC). The project aims to promote sustainable waste management, ensuring efficient recycling and resource optimisation.

Activities

The MRC processes various plastic waste types, including thin flexible-ethylene, propylene polymers, and rigid HDPE packaging containers. These materials are sourced from MRFs, where entrepreneurs procure waste from both rural (villages and panchayats) and urban areas (municipal corporations, waste pickers, and bulk waste generators). The collected plastic waste is shredded, cleaned, and processed into recycled pellets or sheets, which are further supplied to industries for manufacturing new products, contributing to a closed-loop system. The initiative ensures economic stability for waste collectors, and maximises material efficiency with minimal wastage by maintaining fair pricing and timely payments. The project also conducts awareness programs to educate communities on waste segregation and responsible disposal practices.

Integration with Circular Economy

By analysing waste material value, the project strengthens circular economy principles. This project adopts a decentralised systems approach, treating waste management as an interconnected process. The MRC works in close coordination with the MRFs which focuses on material efficiency within an optimised supply chain. This model is the right direction towards creating a circular economy within the state.

Replicability and Scalability

This model can be replicated in other Urban Local Bodies (ULBs) through a proactive community-driven approach, integrating recyclers, the private sector, NGOs, and government bodies.

State/UT	Jammu & Kashmir
Urban Local Body	Jammu Municipal Corporation
Department/ Organisation	Housing & Urban Development Department
Duration	4 years for MRF

Impact

- The Swachh Centre fosters employment opportunities across the waste management supply chain, especially in the recycling and upcycling industries.
- By reducing waste generation, the initiative mitigates pollution, improves public health, and lowers greenhouse gas emissions, contributing to positive climate outcomes.
- The Jammu Municipal Corporation has provided in-kind support worth INR 32,60,000 in utilities and resources, alongside INR 5,30,000 in services from private stakeholders, enhancing the project's economic viability.

To know more

Contact

Prabhjot Sodhi
Sr Program Director (Circular Economy)
prabhjot.sodhi@ceeindia.org
amarpreet.kaur@ceeindia.org

Cloth to Paper Recycling: Ujjain's Sustainable Circular Economy Initiative

State/UT	Madhya Pradesh
Urban Local Body	Ujjain Municipal Corporation
Department/ Organisation	Ujjain Municipal Corporation
Duration	Since 2019

Introduction

An initiative to recycle cloth to paper was undertaken by Ujjain Municipal Corporation (UMC) in 2019. The project aims to eliminate the practice of cloth disposal in the Kshipra River, reducing water pollution and environmental degradation. The initiative also seeks to establish a sustainable, closed-loop system where the paper produced is utilized by the UMC for administrative purposes. This initiative is driven by multiple stakeholders, including Religious event organizers and devotees contribute by facilitating the collection of discarded cloth, ensuring a continuous supply of raw materials.

Activities

As part of this project, the discarded textiles (cloth) from ghats and other religious sites are collected. These textiles are then processed into paper through shredding, pulping, and refining techniques. The recycling plant, managed by UMC, has a processing capacity of 0.035 TPD (tons per day), ensuring a steady conversion of textile waste into usable paper. This paper is subsequently transformed into files, folders, and notepads, which are exclusively procured by UMC, reducing dependency on externally sourced stationery.

Integration with Circular Economy

The cloth-to-paper recycling project exemplifies the principles of a circular economy by converting waste textiles into high-value recycled paper.

Replicability and Scalability

This model holds a potential for replication in other cities, especially those with religious sites that generate large amounts of discarded textiles. Collaborations with NGOs, self-help groups, and religious institutions can enhance outreach and efficiency in waste collection. The initiative can be scaled up by technological advancements in recycling and paper-making can further improve efficiency and output.

Impact

- The initiative aids in water conservation and helps protect aquatic biodiversity. It also reduces greenhouse gas (GHG) emissions by curbing the incineration and decomposition of textile waste, both of which contribute to air pollution.
- The initiative promotes women's empowerment by ensuring that the plant is entirely managed and operated by female staff, offering stable employment opportunities and financial independence.
- The project reduces UMC's expenditure on stationery procurement by ensuring self-sufficiency in paper production. It also provides a stable source of employment for women operating the plant, contributing to local economic development.

To know more

Contact

Mr. Krishna Bhuriya
Plant In charge (Sub-Engineer)
Ujjain Municipal Corporation
commujjain@mpurban.gov.in

Jammu & Kashmir's Waste Management: A Collaborative Pathway

Introduction

Municipal Committee Kunzar and Municipal Committee Tangmarg, have collaborated on a solid waste management initiative that processes and sells all types of dry waste through a Material Recovery Facility (MRF). The initiative ensures systematic door-to-door waste collection, segregation, and scientific processing of both dry and wet waste. The core aim of the initiative is to promote a cleaner environment and financial sustainability in the city.

Activities

The initiative involves the segregated collection of dry & wet waste from households and markets. Wet waste is processed into nutrient-rich compost, which is used in local agriculture to reduce reliance on chemical fertilizers. Plastic waste is collected at designated points for further processing and recycling. Municipal staff and sanitation workers undergo continuous training to improve waste handling. Additionally, the community groups participate in the collection, which fosters a sense of responsibility. Meanwhile, public awareness campaigns educate citizens on the importance of waste segregation and recycling. Lastly, processed plastic waste is sold, ensuring revenue generation and financial sustainability.

Integration with Circular Economy

Plastic waste is compacted into bales and sold to recycling units. On the other hand, organic waste is transformed into high-quality compost for agricultural use. This approach reduces waste transportation and landfill management costs and minimises environmental pollution and promotes community participation.

Replicability and Scalability

The Kunzar model of waste management can be replicated in other urban local bodies across India. There is potential to expand waste collection and recycling points in different locations in the city.

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Committee Kunzar
Department/ Organisation	Municipal Committee Kunzar
Duration	1 year

Impact

- Reduction of plastic pollution and landfill waste, it has helped protect water bodies and soil, contributing to a cleaner environment.
- Increased public awareness and participation in sustainable waste management, encouraging responsible waste disposal practices.
- Created job opportunities in waste collection, processing, and compost distribution, supporting livelihoods.

To know more

Contact

Mir Tafveez Mehmood
Executive Officer
Municipal Committee Kunzer
ulbk@yahoo.com

Tirupati's Solar Shift: Giving Old Panels A New Life

Introduction

With the rapid adoption of solar energy, the challenge of end-of-life solar panels is growing. Tirupati, in collaboration with APEMCL, is pioneering a digital-first approach to recycling solar panels through an online waste exchange portal. The other stakeholders involved in the project include private recyclers, solar panel manufacturers, and waste generators.

Activities

Discarded solar panels are collected from households, industries, and solar farms. The APEMCL Online Waste Exchange Portal is used to track, manage, and facilitate the recycling process. Valuable materials like silicon, glass, and metals are recovered and reintegrated into new solar panel manufacturing.

Integration with Circular Economy

The initiative creates a closed-loop system by recovering 90 percent of the materials from old solar panels and reusing them in new panel production. The APEMCL portal enhances transparency and efficiency in waste management.

Replicability and Scalability

As solar panel waste increases, this initiative provides a scalable model for other regions. The online waste exchange portal enables real-time tracking, making it adaptable to other cities.

State/UT	Andhra Pradesh
Urban Local Body	Tirupati Municipal Corporation
Department/ Organisation	Tirupati Municipal Corporation, in collaboration with AP Environment Management Corporation Limited (APEMCL) and private recyclers
Duration	Operational since 2022

Impact

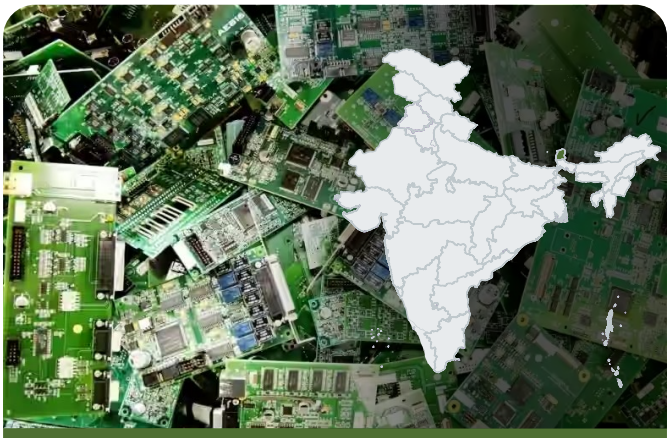
- Reduces electronic waste, conserving critical resources.
- Strengthens waste management through digital tracking and accountability.
- Enhances economic viability of solar panel recycling, making it a sustainable industry.

To know more

Contact

Dr. Dasaradharam Reddy
Chief Operating Officer,
APEMCL Online Waste Exchange Portal,
commissioner.mct@cdma.gov.in

Turning Trash into Treasure: Gangtok's E-Waste Management Initiative



State/UT	Sikkim
Urban Local Body	Gangtok Municipal Corporation
Department/ Organisation	Gangtok Municipal Corporation
Duration	Operational since 2015

Introduction

E-waste poses significant environmental and health risks due to hazardous components. In response, the GMC, in collaboration with the IT Department of Sikkim, established an e-waste collection centre in 2015 to facilitate proper disposal and recycling. Key stakeholders involved were Gangtok Municipal Corporation, State Pollution Control Board and M/s J.S. Pigments– a government authorized recycler.

Activities

The initiative ensures safe collection, transportation, and recycling of e-waste in compliance with national regulations. GMC records and reports e-waste collection data while collaborating with authorised recyclers. The collected e-waste is sent to Kolkata for processing, given the absence of local recycling facilities.

Integration with circular economy

The initiative ensures that discarded electronics are repurposed, reducing reliance on virgin materials. Recovered metals, plastics, and glass contribute to manufacturing new products, minimising environmental impact.

Replicability and Scalability

This model can be expanded to other urban areas in Sikkim. Establishing local e-waste processing units would reduce transportation costs and improve recycling efficiency.

Impact

- Prevents hazardous waste from contaminating the environment.
- Promotes responsible e-waste disposal among citizens.
- Generates revenue through recycler payments to GMC.

To know more

Contact

HK Chettri
Commissioner,
Gangtok Municipal Corporation
gangtok@sikkim.gov.in

Converting Waste into Value: Solid Waste Management in Shopian

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Council Shopian
Department/ Organisation	Municipal Council Shopian
Duration	2 Years

Introduction

An initiative aligned with the Solid Waste Management Rules 2016, Municipal Council Shopian is among the ten municipalities in Kashmir Division with a dedicated Solid Waste Management Plant. The initiative is spread over 62 canals of well-fenced land. Currently, the plant has a waste treatment capacity of 4 TPD (Tons Per Day), which is set to increase to 12 TPD shortly.

Activities

Previously, waste collection at 21 open points in Shopian caused a public nuisance, posing risks to residents. With the Solid Waste Management Plant at Aglar Shopian, waste is treated scientifically. The initiative generates revenue by selling recyclable waste and manure. Waste collection is now organized, with ten garbage vehicles collecting segregated waste from households daily. At the treatment plant, dry and wet waste is further separated using a conveyor belt. Additionally, nine temporary and one permanent RRR Centre have been set up, encouraging citizens to donate old items for reuse, with door-to-door drives, recycled goods displays, and awareness campaigns.

Integration with Circular Economy

The initiative follows circular economy principles by identifying the hidden value of waste. Recyclable materials such as plastic, paper, metal, and glass are processed and sold to industries and MSMEs, generating income. Organic compost, produced from biodegradable waste, benefits local horticulturists by reducing dependency on expensive chemical fertilizers. The program ensures that waste is reused, repurposed, and reintegrated into the local economy, minimizing environmental impact.

Replicability and Scalability

This model can be replicated in smaller towns where households and bulk waste generators have available land for waste processing. Environmentalists, in collaboration with NGOs, can scale up the initiative by promoting community pit composting, further expanding sustainable waste management efforts.

Impact

- Less waste reduces pollution and lowers the carbon footprint by cutting greenhouse gas emissions.
- Public participation in waste segregation and recycling promotes cleaner habits and community awareness.
- Selling recyclable materials generates income, while organic compost helps farmers reduce the costs of chemical fertilizers.

To know more

Contact

Mohammad Iqbal Bhat
Chief Executive Officer
Municipal Council Shopian
eomcshopian@gmail.com

Transforming Urban Waste Management: A Case Study of Ghaziabad

Introduction

The Ghaziabad Nagar Nigam (GNN) aims to establish a streamlined system for efficient waste segregation, collection, and recycling to minimise environmental impact and improve operational efficiency. The primary focus is on source segregation by households, bulk waste generators (BWGs), Resident Welfare Associations (RWAs), and industries, ensuring minimal mixing of dry and wet waste.

Activities

Ragpickers are formally included in the waste management system, receiving training and equipment to enhance their safety and efficiency while reducing informal scavenging and waste pilferage. Revenue generation remains a crucial aspect, with the initiative yielding INR 3,75,00,000 in the last financial year (2024). A significant 25 percent of this income is allocated to the Safaimitra Welfare Fund, improving the financial security and working conditions of sanitation workers. Collected waste is transported to Material Recovery Facilities (MRFs) in Sihani and Raitmandi, where further sorting and processing occur, facilitating vendor integration and maximising resource recovery. The segregated waste is processed at MRFs located in Sihani and Raitmandi, where recyclables are sorted and prepared for reuse.

Integration with Circular Economy

Segregated recyclables are channelled through MRFs for reuse in manufacturing and production. Processed waste materials are converted into new items, reducing dependence on virgin resources. Collaborations with vendors and ragpickers ensure efficient resource circulation.

Replicability and Scalability

The adaptable waste management model integrates source segregation, MRF processing, and stakeholder participation for municipal scalability. Expanding infrastructure, policy advocacy, and public awareness will enhance waste handling capacity and long-term success.

State/UT	Uttar Pradesh
Urban Local Body	Ghaziabad Nagar Nigam (GNN)
Department/ Organisation	Ghaziabad Nagar Nigam (GNN)

Impact

- Reduced landfill dependency, lower greenhouse gas emissions, decreased waste spillage, and improved public health.
- Ragpicker inclusion and Safaimitra Welfare Fund allocation enhance livelihoods and ensure better working conditions.
- Revenue generation of INR 3,75,00,000 in the last fiscal year (2024), with further growth projections.

To know more

Contact

Vikramaditya Singh Malik, IAS
Municipal Commissioner
Ghaziabad Nagar Nigam
gzb.-nagar.nigam@gmail.com

West Bengal's Sustainable Revolution: Innovating SWM for a Better Future

State/UT	West Bengal
Gram Panchayat	Bagda
Department/ Organisation	Department of Drinking Water & Sanitation

Introduction

The Gram Panchayat (GP) of Bagda driven by the vision of preserving environmental quality for future generations, has developed an innovative model for self-sustainable Solid Waste Management (SWM), benefiting 5,720 households. The unit converts plastic, thermocol, and hyacinth into reusable products, funded by household and business fees. This model exemplifies sustainable rural waste management and circular economy potential.

Activities

Before the establishment of the SWM unit, the primary focus was on creating awareness about waste segregation through door-to-door campaigns. Several surveys were conducted to assess the extent of intervention required for achieving self-sustainability of the unit. Initially, a pilot project was implemented, involving the collection of waste from 2,800 households (HHs) according to planned route maps and collection frequencies. To cover the operational costs, a monthly collection fee of Rs. 20 per household was charged, and pedal e-rickshaws were used for waste collection. Subsequently, waste collection was expanded to encompass all HHs, and the responsibility was entrusted to 10 Self-Help Group (SHG) units comprising 120 waste collectors. Each SHG was assigned to manage waste collection in one village separately.

Integration with Circular Economy

The SWM unit in Bagda GP stands out for its innovative technologies that focus on upcycling and recycling waste products. The conversion of various waste materials into reusable products showcases the potential for creating a circular economy at the grassroots level. This model can serve as an inspiration for other rural areas aiming for effective and sustainable waste management practices.

Replicability and Scalability

This model can be replicated in smaller GPs, with the establishment of small-scale neighbourhood groups to effectively monitor and manage the program.

Impact

- The distinguishing feature of the SWM unit is its ability to convert all collected waste including thermocol, plastic, hyacinth, etc. into reusable products. Through regular service fee collections, such as Rs. 100 from hotels and Rs. 20 from shops and households monthly, the SWM unit has achieved self-sustainability. Overall, the Self-sustainability efforts of Bagda GP is yielding remarkable results.

To know more

Contact

Pushpa Sardar
Pradhan,
Gram Panchayat
bagdahgp@gmail.com

Chattisgarh's E-Waste Management: Responsibly Disposing Waste

State/UT	Chhattisgarh
Urban Local Body	Municipal Corporation Raipur
Department/ Organisation	Raipur Municipal Corporation in collaboration with Star e-Processors
Duration	2018- Ongoing

Introduction

E-waste has emerged as a significant environmental concern due to the rapid increase in electronic consumption. To improve e-waste management and enhance environmental sustainability the municipal corporation of Raipur implemented initiatives to promote responsible disposal, and recycling of e-waste. The initiative involves structured collection, awareness programs, and fostering community engagement to mitigate the negative impacts of e-waste.

Activities

The e-waste management initiative commenced with extensive awareness programs incorporating short films, nukkad natak (street plays), and youth organisations to educate the public. These efforts aimed to inform citizens about the door-to-door collection process, the careful handling of e-waste, and its responsible recycling. The initiative emphasised the significance of proper e-waste disposal, the environmental risks of improper handling, and the broader benefits of sustainable e-waste management.

To facilitate implementation, 20 personnel have been deployed, supported by two collection vehicles and a dedicated processing facility, ensuring efficient e-waste collection and disposal across the city.

Integration with Circular Economy

Since 2019, the initiative has successfully collected approximately 253 tonnes of e-waste, which is processed and recycled to extract valuable materials. The collected waste is repurposed, reducing the environmental footprint and promoting resource efficiency. The initiative aligns with circular economy principles by transforming e-waste into reusable materials and supporting sustainable practices.

Replicability and Scalability

The initiative has already been expanded to other urban local bodies in the state and has the potential for nationwide replication. Scaling up the model will involve strengthening coordination with the general public to ensure the city moves towards becoming e-waste-free, fostering broader community involvement in electronic waste disposal, recycling, and management.

Impact

The program has generated a revenue of INR 91,00,000 (approx.) over six years and has provided financial benefits to citizens by allowing them to sell e-waste at their doorsteps. This initiative has also minimised environmental damage by preventing hazardous e-waste disposal, ensuring responsible recycling. Additionally, the initiative has yielded a profit of INR 5,86,000 for the organisation.

To know more

Contact

Mr. Yogesh Kadu
Nodal Officer
Mr. Mehul Thakkar
Star e-waste processors
Municipal Corporation Raipur
sbmrmc2024@gmail.com

Sagar's C&D Waste: A Valuable Resource

Introduction

Sagar Municipal Corporation has established a mechanized construction and demolition (C&D) waste management system to promote sustainable urban cleanliness and resource recovery. Launched in November 2024, this project aims to minimize landfill dependency by establishing an efficient system for C&D waste collection, processing, and recycling. Under the Public Health and Sanitation Department, the initiative aligns with the Swachh Bharat Mission and C&D Waste Management Rules (2016) by promoting the reuse of construction waste to develop value-added products like bricks and paver blocks. The key stakeholders of this initiative are Sagar Municipal Corporation, Sagar Smart City Limited and Vats Realtech Private Limited (Concessionaire).

Activities

The C&D waste management system operates across all 48 wards through an on-call pickup service, similar to food delivery apps like Zomato and Swiggy. A fleet of specialized vehicles collects and transports waste to a 50 tons per day processing plant, ensuring efficient handling. At the plant, mechanized segregation separates materials like concrete, bricks, and steel, optimizing resource recovery. The recovered materials are processed into value-added products, including paver blocks for pavements and roads, while dust and fine particles are repurposed for backfilling, road sub-base construction, and landscaping.

Integration with Circular Economy

This initiative follows a closed-loop recycling approach, reducing reliance on virgin materials and promoting sustainability. Local construction projects, including those by Sagar Smart City Limited and authorized contractors, utilize these recycled products.

Replicability and Scalability

The on-call C&D waste collection model can be replicated in other cities to ensure efficient waste management, while the mechanized processing approach offers a scalable solution for Urban Local Bodies (ULBs) to enhance waste recovery and recycling. Public-private partnerships (PPP) can further drive expansion nationwide.

State/UT	Madhya Pradesh
Urban Local Body	Sagar Municipal Corporation
Department/ Organisation	Sagar Municipal Corporation, Public Health and Sanitation Department
Duration	Since 3 months (Start: November 01, 2024)

Impact

- About 10 TPD of waste is diverted from landfills.
- The initiative led to lower carbon footprint due to decreased demand for virgin construction materials.
- The extraction of sand, stone, and other natural materials are reduced.

- Employment opportunities for local workers and Women Self Help Groups.
- The C&D Waste Management initiative has significantly transformed public behavior by promoting responsible waste disposal and discouraging illegal dumping.

- Revenue generation from selling bricks and paver blocks.
- Cost savings for municipal infrastructure projects by reusing recycled materials.

To know more

Contact

Raj Kumar Khatri (SAS)
Commissioner,
Sagar Municipal Corporation
commsagar@mpurban.gov.in

Jiribam's Green Initiative: Upcycling Old Freezer and Glass Ware

State/UT	Manipur
Urban Local Body	Jiribam Municipal Council
Department/ Organisation	Jiribam Municipal Council
Duration	1 Year

Introduction

Jiribam Municipal Council in Manipur has taken an innovative approach to waste management by repurposing old freezers as plastic banks and reusing glass bottles for beautification and functional construction. The initiative aims to ensure the safe disposal of e-waste and glass waste while promoting environmental sustainability and community engagement. By transforming discarded items into useful community assets, this initiative fosters circular economy practices and raises awareness about responsible waste management.

Activities

Jiribam Municipality has organized designated e-waste collection drives and permanent drop-off locations for residents and businesses to ensure safe disposal of electronic waste. As part of this initiative, old freezers are being reused as plastic banks, encouraging the local community to separate and deposit plastic waste for recycling. Additionally, glass waste management has been promoted by repurposing glass bottles for beautification projects, such as garden borders in parks, and for construction purposes. A changing room for women sanitary workers has been built using glass bottles, ensuring both functional and aesthetic utility.

Integration with Circular Economy

This initiative integrates circular economy principles by focusing on recycling and reuse. The project promotes the idea of extending the life cycle of materials by repurposing them for new functions, aligning with global sustainability goals.

Replicability and Scalability

The reuse of e-waste items can be extended to schools, research labs, or community programs for educational purposes. Municipalities can adopt similar approaches by repurposing discarded appliances and materials into useful community assets, promoting sustainability, and reducing environmental pollution. Scaling up the initiative can involve engaging private sector stakeholders, expanding collection networks, and integrating advanced recycling techniques.

Impact

- Reduction in e-waste and glass waste, minimized plastic pollution, and enhanced public spaces with eco-friendly materials.
- Increased community participation in waste management, improved awareness of recycling, and better facilities for women sanitary workers.
- Cost savings in waste management through reduced landfill burden and efficient recycling systems.

To know more

Contact

NG. Uttam Singh
State Mission Director - Manipur
sbmmanipur@gmail.com

Integrated Resource Recovery Park: Jaipur's Waste-to-Resource Initiative

Introduction

An Integrated Resource Recovery Park was established at Tholai, Tehsil Jamwaramgarh, District Jaipur. The initiative aims to bring recyclers of different waste streams together in a designated industrial zone to facilitate efficient waste recovery and resource optimization. This project aligns with circular economy principles, reducing landfill dependency and promoting industrial symbiosis.

Activities

The Park spans 48.21 hectares and is designed to house industries engaged in recycling end-of-life vehicles, electronic waste, plastic, hazardous materials, and lithium-ion batteries. The project, costing INR 50,00,00,000, has received financial backing under the Special Assistance to States for Capital Investment (PM GatiShakti). As of 2023, RIICO has sanctioned INR 50,17,00,000 for development, with INR 19,41,39,000 spent on infrastructure. A total of 100 industrial plots are planned, with 10 plots allotted so far. Additionally, the initiative ensures adherence to environmental standards and waste management regulations to create a sustainable and compliant framework for waste recovery industries.

Integration with Circular Economy

The project fosters a circular economy by promoting waste-to-resource transformation. By co-locating recycling industries, the park enhances waste recovery efficiency and reduces the need for raw materials. The recycling and refurbishment of end-of-life products contribute to resource conservation and waste minimization.

Replicability and Scalability

Rajasthan has proposed two additional Integrated Resource Recovery Parks at RIICO Industrial Area – Gundi Fatehpur, Kota, and the Proposed RIICO Industrial Area at Kairwa and Bhiwadi. Expanding this model to other industrial hubs will enhance the state's waste management capacity and accelerate the adoption of circular economy practices on a larger scale.

State/UT	Rajasthan
Urban Local Body	Rajasthan State Industrial Development and Investment Corporation Limited (RIICO)
Department/ Organisation	Rajasthan State Industrial Development and Investment Corporation Limited
Duration	2023 - Ongoing

Impact

- Reduces landfill usage, mitigates greenhouse gas emissions, and supports Sustainable Development Goals (SDGs) through responsible waste handling.
- Encourages skill development and job creation in waste collection, transportation, and processing.
- Facilitates investment in waste recycling, reduces costs of waste disposal, and generates employment in the waste management sector.

To know more

Contact

Ajay Gupta
Additional General Manager (EM)
Rajasthan State Industrial Development and Investment Corporation Limited (RIICO)
em_cell@riico.co.in

Puducherry's Integrated Solid Waste Process: Yields Sustainable Resource Recovery

Introduction

The Government of Puducherry, through the Local Administration Department (LAD), established the Integrated Municipal Solid Waste Processing and Management (IMSWM) Project to implement advanced waste management practices. This initiative aims to enhance waste segregation, recycling, and sustainable resource recovery by adopting Industry 5.0 and IoT systems, thereby promoting a zero-waste methodology and circular economy principles.

Activities

The project is implemented by M/S Greenwarrior. Waste is categorized into organic, inorganic, and hazardous streams for efficient processing. The center employs mechanical segregation to ensure contaminant-free waste handling. Waste-to-resource strategies maximize recovery and sustainability: recyclables are sold, garden waste is converted into energy pellets, and MLP plastics undergo pyrolysis for carbon black and alternative fuel. RDF is processed into pellets for cement industries, while organic waste is turned into compressed biogas (CBG) and bio-fertilizers. Windrow composting produces compost for farmers, and liquid fertilizer is recycled for gardening. C&D waste is repurposed for infrastructure, reducing quarry stone reliance.

Integration with Circular Economy

This initiative follows circular economy principles by converting waste into resources like compost, biogas, and alternative fuels, reducing landfill use and hazardous waste. It enhances environmental sustainability by curbing pollution in air, soil, and water through responsible waste disposal and reuse.

Replicability and Scalability

This model can be replicated across India with technological modifications suited to regional waste characteristics and volumes. The project can be scaled with support fromfunding sources, including SIDBI loans, additional SBM grants, and CSR contributions for long-term operational expansion and sustainability.

State/UT	Puducherry
Urban Local Body	Pondicherry Municipality & Oulgaret Municipality – Cluster Based
Department/ Organisation	Local Administration Department (LAD), Government of Puducherry
Duration	Feb 2024 onwards (19 years)

Impact

- Reduces methane emissions and pollution from landfill sites.
- Prevents plastic waste burning and promotes aerobic waste decomposition.
- Enhances air and water quality by eliminating landfill dependency.
- Raises public awareness on pollution reduction and environmental hygiene.
- Strengthens waste collection efficiency, reducing health hazards.

To know more

Contact

S. Shakthyvel
Director (Local Administration) – cum – Mission Director (SBM – Urban 2.0)
Local Administration Department (LAD),
Government of Puducherry
dirlad@py.gov.in

Sustainable Waste Solutions: Mangan Nagar Panchayat's Multi-Pronged Approach

Introduction

The initiatives aim to manage and minimise municipal solid waste while focusing on recycling and revenue generation.

Activities

As part of its initiative, Mangan Nagar Panchayat has installed an Organic Waste Converter machine, capable of producing 30 kg of manure per cycle, alongside four large composting units to manage excess wet waste. The manure is used in an organic nursery to cultivate seasonal vegetables and flowers for sale, while 2 kg manure bags are sold at Rs. 100, generating revenue. A Material Recovery Facility (MRF) with a 2 TPD processing capacity has been established, to recover 70 percent of solid waste with support from agencies like JS Pigments in Kolkata. RRR Centre also collects and redistributes clothes, bags, shoes, books, and toys, reducing textile waste and benefiting underprivileged communities. Additionally, the ULB has developed eco-friendly bricks from plastic waste, combining heated plastic with coarse sand to create durable materials used for pothole filling, speed breakers, and partition walls, providing a sustainable construction alternative.

Integration with Circular Economy

All initiatives align with circular economy principles, emphasising recycling, reuse, and value-added waste products. Standard Operating Procedures (SOPs) have been established to ensure smooth implementation and sustainability.

Replicability and Scalability

These initiatives serve as a replicable model for other cities with similar urban profiles. Their success demonstrates how effective waste management can be tailored to different municipal needs. By incorporating advanced waste processing technologies, the impact of these programmes can be significantly amplified, ensuring long-term sustainability and efficiency.

State/UT	Sikkim
Urban Local Body	Mangan Nagar Panchayat
Department/ Organisation	Urban Development Department
Duration	Initiated in 2023

Impact

- The waste management policies prioritise environmental conservation, biodiversity preservation, and sustainable development. Additionally, they contribute to resource conservation, waste minimisation, water conservation, and greenhouse gas (GHG) reduction, ultimately improving public health and safety.
- These initiatives have successfully generated revenue from waste management, a significant achievement for a small ULB like Mangan Nagar Panchayat.

To know more

Contact

Tempo Tashi Bhutia
Deputy Secretary cum Municipal Executive Officer
Urban Development Department
mnpnorth@gmail.com

RRR CENTRES

The Government of India has been working towards raising public awareness about the importance of reducing community reliance on single-use plastics, by strongly promoting the concept of reusing and recycling waste. The RRR (Reduce, Reuse, Recycle) Centres initiative was launched under the Swachh Bharat Mission - Urban 2.0 in 2023 as part of the “Meri LiFE Mera Swachh Shehar” campaign. A one-stop solution, these easily accessible community recycling centres encourage and enable citizens to donate waste items for refurbishing or recycling, promoting sustainable practices. Accessible via Google Locator, there are nearly 21,000 centres in urban India, with over 4,000 operational year-round and 16,000 temporarily set up during festivals or in support of vulnerable groups who receive repurposed and recycled articles from these centres - effectively lengthening the longevity of each donated product, minimising waste, and creating a circular loop.

Waste-to-Wealth Hubs: Baramulla's RRR Centres

Introduction

The Municipal Council Baramulla has set up a RRR (Reduce, Reuse, Recycle) Centre aimed at promoting sustainable waste management practices through the repurposing and creative reuse of discarded materials. The centre focuses on utilising various waste materials, such as drums, tyres, plastic cans, bottles, old clothes, and electronics, to create new, functional, and innovative products.

Activities

With a target to reduce the amount of waste that ends up in landfills by repurposing the same, recycling materials in an eco-friendly manner, and reusing discarded items to create innovative products, the RRR centres are well-positioned to establish a circular and sustainable waste management apparatus in the city. Waste materials are collected from households, businesses and public spaces and brought to the RRR centre, where they are subsequently processed into new products or stored for showcasing. Some of the products made include furniture such as chairs and tables made entirely from scrap material and flower pots made of tyres, plastic bottles or cans.

Baramulla has successfully demonstrated how decorative items, planters, household accessories, or art pieces can be made from scrap material and waste items under their "Kabard Se Jugaad" or waste-to-innovation scheme. This initiative encourages local communities to think about how they might reuse everyday waste items in creative ways, reducing their carbon footprint and contributing to a circular economy.

Integration with Circular Economy

The basic tenets of a RRR centre are rooted in a circular economy, and Baramulla is no different. Through waste minimisation, processing and recycling efforts, it works within a closed-loop system, ensuring maximum utilisation of all resources duly recovered in the process.

Replicability and Scalability

The Municipal Council Baramulla has set up an easy-to-replicate solid waste management apparatus that will be highly beneficial if and when implemented in other municipalities across India. The circular framework within which it is set is highly environmentally beneficial and cost-effective. Additionally, it urges social mobilization towards climate-conscious waste management.

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Council Baramulla
Department/ Organisation	Municipal Council Baramulla
Duration	Ongoing

Impact

- Minimizing the amount of waste sent to landfills and incinerators by redirecting them to the RRR.
- Preventing the accumulation of waste in open dumpsites, drains, roads, sewers, and waterbodies, effectively reducing land and water pollution.
- Increased community awareness and participation in waste segregation, collection and recycling.
- Revenue generation through the sale of recycled goods, and the creation of employment opportunities for residents.

To know more

Contact

Naveed Ajaz Khan
CEO
Municipal Council Baramulla
navidaijaz@gmail.com
eomcbaramulla@gmail.com

Giving A New Home for Old and Unused Goods: Jamnagar RRR Centers

State/UT	Gujarat
Urban Local Body	Jamnagar Municipal Corporation
Department/ Organisation	Jamnagar Municipal Corporation
Duration	June - January 2024

Introduction

Gujarat's Jamnagar has steered itself towards the determined goal of finding "A New Home for Old and Unused Goods" in its bid to promote sustainable waste management practices and reduce the amount of waste generated and sent to landfills or incinerators within the city limits. Reduce, Reuse, Recycle (RRR) centres were set up across the city as a one-stop solution that locals can avail to donate old and used articles, such as books, clothes, toys, metal items, footwear, and other utility items.

Activities

Citizens are encouraged to donate articles that can be put to their second use. Citizens bring their donations to their nearest ward office, which are called collection points. As collection points gather various used items, Jamnagar's RRR centers actively sort daily donations to identify articles that can be repurposed or further donated to those in need. Thereafter, the sorted items are sent to processing centres where the articles were further sorted and repurposed or upcycled to lengthen their lifecycle.

Clothes and toys are distributed in local slum areas to people in need. The books that are donated are further organised in different cabinets to create ad hoc libraries for students or citizens who might be in need of second-hand editions.

Integration with Circular Economy

Metal scraps and broken toys are often passed onto local kabadiwalas who give them to recyclers for recycling. Further, reusable plastic items are also sent on to Material Recovery Facilities to enable successful resource recovery, as required.

Replicability and Scalability

Jamnagar Municipal Corporation is planning to establish two to three more RRR centres across the city, to enable better accessibility for more communities and neighbourhoods. RRR centres are a robust urban intervention into the issue of proliferating municipal waste. Care should be taken to ensure that the centres are easy to access and visible so that citizens can avail of their services with little to no difficulties.

Impact

- Minimizes the amount of waste sent to landfills and incinerators.
- Promotes sustainable social practices such as recycling, and encourages a sense of social responsibility towards taking climate conscious actions.

To know more

Contact

Ketan Kateshiya
Deputy Engineer, Solid Waste Management
Jamnagar Municipal Corporation
Jmcswm38@gmail.com

Adding the 4th R to RRR: Chandigarh's One Rupee Store

Introduction

The Municipal Corporation Chandigarh (MCC) has launched a project to encourage the principles of Reduce, Reuse, Recycle (RRR). The goal is to reduce waste, save resources, and help people in need. The project collects used items, refurbishes, and redistributes them to extend their lifecycle. A special RRR center has been set up where people can donate their old items. These items are repaired and then made available at a One Rupee Store, making them affordable, while also promoting sustainability.

Activities

MCC has established 35 RRR collection centers across Chandigarh, along with Swachh Sawari for doorstep donation collection. A permanent RRR Center at Sector 17 Plaza ensures smooth operations and draws donors from across the city. Since its launch on June 7, 2023, the center has received nearly 80,000 donated items, including clothes, books, and shoes. Furthermore, the collected items were refurbished. 27,000 of them were distributed to vulnerable groups and 35,000 clothing items were repurposed by Self-Help Groups. MCC also organises awareness campaigns in partnership with NGOs and artisans for refurbishing items. It also emphasizes employee engagement and maintains strict quality control to ensure that the donated goods are suitable for reuse.

Integration with Circular Economy

This initiative follows the circular economy model, where used items are collected, checked, repaired, and reused instead of being discarded. This creates a successful, sustainable system within the city by extending the life of products. The One Rupee Store plays a key role by making refurbished items accessible to the community at a minimal cost.

Replicability and Scalability

This initiative can be easily replicated within other cities to improve their waste management and community involvement. The RRR Center and One Rupee Store model can be adapted to suit the requirements of different urban areas. With the right awareness campaigns, this concept can be scaled up to make cities more sustainable and waste-free.

State/UT	Chandigarh
Urban Local Body	Municipal Corporation Chandigarh
Department/ Organisation	Municipal Corporation Chandigarh
Duration	1 year

Impact

- The RRR model reduces the consumption of raw materials and energy used in manufacturing new products. Hence, greenhouse gas emissions are also decreased.
- The engagement builds a sense of community by encouraging people to support sustainability while helping vulnerable groups.
- The initiative decreases the cost of making a new product as well as creating jobs in repair and refurbishing work.

To know more

Contact

Gurinder Singh Sodhi
Joint Commissioner,
Municipal Corporation Chandigarh
jtcmciii@gmail.com

Effective Waste Recycling Hub: Jharkhand's RRR Centre

Introduction

The Reduce, Reuse, Recycle (RRR) Initiative encourages individuals, businesses, and communities to reduce waste production, reuse materials when possible, and recycle discarded items to keep valuable resources in circulation. This approach minimises the environmental impact of waste and resource consumption.

Activities

Eight RRR centres are functioning across Giridih, ensuring accessibility for both high-footfall and remote areas. Self-Help Group (SHG) members from Moti SHG and Aparajita SHG repurpose old clothes into doormats, pots from soap wrappers, and bangle stands from unused papers to reduce waste. Volunteers from Rotary Giridih, led by Vikas Sinha, actively collect and distribute used clothes to those in need, contributing to reuse. A permanent recycling centre near the Forest Office in Giridih converts old clothes into cotton, which is mixed with fresh cotton to create mattresses at affordable prices. The recycling initiative, led by Md Shahnawaz and his wife, is supported by Giridih Nagar Nigam, which has provided infrastructure to sustain their livelihood.

Additionally, the campaign leverages social media, print, and electronic media for outreach, ensuring maximum community participation. To encourage citizen involvement, participants receive 1 kg of compost made from wet waste as an incentive, along with a certificate recognizing their contribution.

Integration with Circular Economy

The initiative promotes sustainable resource utilization by repurposing and recycling old clothes into useful products, contributing to a circular economy.

Replicability and Scalability

The RRR model offers high replicability, as its core principles can be adapted to diverse regions. Giridih Municipal Corporation plans to scale up by increasing the number of RRR centres, expanding SHG involvement, and integrating more recycling technologies. Other municipalities can adopt similar models by engaging local communities, leveraging existing infrastructure, and promoting awareness through digital platforms.

State/UT	Jharkhand
Urban Local Body	Giridih Municipal Corporation
Department/ Organisation	Giridih Municipal Corporation
Duration	24 May 2023 to 03 June 2023

Impact

- Reduces waste generation and landfill dependency.
- Encourages responsible waste disposal, leading to a cleaner and healthier urban environment.

- Enhances civic engagement by rewarding active participation in waste reduction efforts, and awareness campaigns.
- Strengthens community engagement by involving volunteers and NGOs.

- Reduces municipal expenses associated with waste disposal and landfill management.
- The recycling centre provides economic opportunities to local artisans and SHG members.

To know more

Contact

Abhishek Prakash
City Manager,
Giridih Municipal Corporation
giridihmunicipalcorporation@gmail.com

Reviving Resources: Gangtok's RRR Centre Tackles Textile Waste

State/UT	Sikkim
Urban Local Body	Gangtok Municipal Corporation
Department/ Organisation	Gangtok Municipal Corporation
Duration	Operational since 2024

Introduction

The Gangtok Municipal Corporation (GMC) launched the RRR Centre in Deorali to combat textile waste pollution in natural waterways. Despite multiple awareness campaigns, citizens continued discarding and disposing textiles improperly. The initiative aims to encourage collection, reuse, and recycling to mitigate environmental damage. The key stakeholders were Gangtok Municipal Corporation, Citizens and Registered Scrap Dealers.

Activities

The RRR Centre, inaugurated on 24 June 2024, provides residents with a designated drop-off point for reusable items such as old clothes, books, and fabric. GMC facilitates collection and works with scrap dealers to transport materials outside Sikkim for recycling, as the state lacks processing facilities. Regular collection drives in each ward ensure participation.

Integration with circular economy

The initiative promotes sustainable consumption by extending product lifecycles and reducing raw material demand. Scrap dealers play a key role in ensuring collected materials are reintroduced into the economy through reuse and recycling.

Replicability and Scalability

Other urban local bodies in Sikkim can adopt this model to enhance waste segregation and recycling. Establishing local textile processing units would further increase efficiency and economic benefits.

Impact

- Diverts waste from landfills, reducing environmental burden.
- Encourages a culture of reuse and responsible disposal.

To know more

Contact

HK Chettri
Commissioner
Gangtok Municipal Corporation
gangtok@sikkim.gov.in

Empowering Jamshedpur Women: The SHS Group's RRR Model

Introduction

The SHS Group's 'reduce-reuse-recycle' Initiative empowers women to transform plastic and dry waste into eco-friendly products, fostering economic independence and environmental conservation.

Activities

A RRR (Reduce, Reuse, Recycle) centre has been established where women create bags, door curtains and mats, and bedsheets from old clothes and envelopes from waste paper, effectively replacing single-use plastics. By utilising recycled materials, they keep production costs low while ensuring affordability for consumers. The Jamshedpur Notified Area Committee (JNAC) has been purchasing the bags in bulk for distribution within the community, providing a consistent revenue stream for the women. By partnering with local medical associations, the women supply envelopes made from waste paper, providing steady orders and enhancing their reputation as eco-friendly suppliers.

Integration with Circular Economy

The initiative promotes circularity by repurposing plastic and dry waste into new products, reducing landfill dependency and environmental degradation, enhancing resource efficiency and minimising waste. Additionally, the initiative ensures the sustainable use of resources through recycling and reuse, contributing to long-term environmental benefits and providing income-generating opportunities for women through sustainable business practices.

Replicability and Scalability

The SHS Group's 'RRR' model can be replicated in other urban and semi-urban regions to enhance women's livelihoods and promote sustainable waste management. Scaling strategies include - Expanding participation among more SHGs and local market associations; Strengthening partnerships with corporate CSR initiatives for funding and outreach; and Establishing additional RRR centres to accommodate more participants and increase production.

State/UT	Jharkhand
Urban Local Body	Jamshedpur Municipal Corporation
Department/ Organisation	Jamshedpur Municipal Corporation
Duration	2022- ongoing

Impact

- Reduces plastic waste and promotes eco-friendly alternatives.
- Increases awareness of waste reduction and recycling practices.
- Contributes to cleaner public spaces and reduced landfill burden.

- Enhances financial stability and self-sufficiency for women by job generation. Holds the potential for more job creation in the manufacturing chain.
- Supports children's education by improving household income.
- Women act as advocates for sustainable practices, raising awareness about the importance of recycling and responsible waste management.

- Generates revenue through the sale of recycled bags and envelopes, especially through bulk purchase agreements

To know more

Contact

Deepak Sahay
Executive Officer,
Jamshedpur NAC,
jnacjsr@gmail.com

Reduce, Reuse, Recycle: Jharkhand's Initiative for Waste Management

Introduction

Under the "Mera Life, Mera Swachh Shaher" campaign in 2023, the Jamshedpur Notified Area Committee (JNAC) established RRR (Reduce, Reuse, Recycle) centers to promote circular economy and best practices in waste management. The initiative aimed to encourage citizens to bring unused household items to the RRR centers for recycling and reuse.

Activities

JNAC has set up 24 RRR Centers across the city, enabling the collection and processing of waste items such as old clothes, newspapers, footwear, and plastic waste. Public outreach through social media, newspaper campaigns, and door-to-door awareness drives has played a key role in engaging citizens and fostering community participation, encouraging them to donate waste. The waste is sorted in mainly 3 categories: cloths, footwear and plastic waste.

Recycled paper waste, including old newspapers and scrap paper, is processed into envelopes supplied to medical shops through an MoU with the Medical Association, significantly reducing plastic waste. Collected clothing is transformed into bags, carpets, doormats, and bed sheets, with over 100 tons of used clothing either repurposed or distributed to those in need. Materials recovered from the initiative have been creatively repurposed in the Waste-to-Wonder Park, where wooden frames retrieved from rivers have been converted into chairs and dustbins, PET bottles have been made into plant pots, and old jeans have been upcycled into decorative planters. Additionally, over 30 women from SHGs have been trained in recycling and repurposing waste into marketable products, providing economic opportunities.

Integration with Circular Economy

The initiative fosters a closed-loop waste system by reducing waste at the source, promoting upcycling, and repurposing discarded materials. By diverting waste from landfills and converting it into useful products, the program strengthens resource efficiency and minimizes environmental impact.

Replicability and Scalability

The JNAC's RRR Center model can be replicated in other cities by establishing collection hubs, partnering with local businesses, and engaging communities through awareness campaigns.

State/UT	Jharkhand
Urban Local Body	Jamshedpur Notified Area Committee
Department/ Organisation	Jamshedpur Notified Area Committee
Duration	20th May 2023– ongoing

Impact

- Reduction in plastic waste through the promotion of reusable products.
- Recycling of over 4 tons of paper and 100 tons of old clothes, reducing landfill waste.
- Conservation of resources through waste diversion and sustainable repurposing.
- Women's empowerment through skill development and income opportunities.
- Community engagement in waste reduction and responsible recycling practices.
- Revenue generated from recycled products such as paper bags, cloth bags, and carpets.
- Cost savings by reducing plastic dependency and promoting sustainable alternatives.

To know more

Contact

Jyoti Punj Pandey
City Manager
Jamshedpur Notified Area Committee
jyotipunj14@gmail.com

WASTE-TO-WEALTH

Waste can generate wealth, as it carries an inherent value that is not just a by-product; it holds immense potential to be transformed into valuable resources. Tapping into this value, sustainable practices endorsed by Government initiatives such as the Swachh Bharat Mission and the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme have encouraged innovative waste management solutions. Across the country, states are adopting circular economy principles and leveraging technologies for resource recovery, to turn waste into an economic and environmental opportunity. From turning waste into nutrient-rich compost to repurposing discarded articles into new products, India's waste-to-wealth outlook emphasises the potential for waste to yield reusable resources with financial value, blending innovation with dedicated sustainable practice.

Belagavi's Floral Waste: Karnataka's Waste-to-Wealth Opportunity

State/UT	Karnataka
Urban Local Body	Belagavi City Corporation
Department/ Organisation	Belagavi City Corporation, Durga Self-Help Group
Duration	2023-onwards

Introduction

Tackling the challenge of discarded floral waste that accumulates at religious institutions, as well as during major religious festivals or ceremonies, the Belagavi City Corporation in Karnataka has implemented a sustainable strategy to recycle, reuse, and repurpose the floral waste to create incense sticks. Discarded flowers are often dumped into local waterbodies such as rivers or lakes, perpetuating an environmental hazard. This initiative is a critical intervention to counter the perils of untreated waste and prevent it from contaminating and destabilising local ecosystems.

Activities

The Belagavi City Corporation has set up a facility in the Ashoka Nagar Wholesale Flower Market within the city premises to create a localised and targeted taskforce. The market generates more than 500 kilograms of flower waste per day. The identification of the market as a bulk-waste generator within the purview of this intervention has enabled the in-situ collection, management, and processing of the waste concerned. The project is operated by a team of 10 members from the Durga Self-Help Group that oversee the conversion of the waste into the incense sticks by first drying the flowers and then converting them into powder form.

Integration with Circular Economy

The Belagavi City Corporation has successfully initiated a zero-waste framework to implement the tenets of a circular economy in the aforementioned market. The floral waste collected is completely utilised in the making of the incense sticks, simultaneously encouraging social awareness about the importance of reusing and recycling waste products wherever possible.

Replicability and Scalability

The initiative can be replicated in many areas where floral waste poses a challenge. Bulk-waste generators can be identified locally, to initiate pilot projects before eventually expanding the same across other urban or rural pockets in the state.

Impact

- The project generates public awareness and accountability about the life cycle of waste.
- The project also encourages the city to opt for recycled, repurposed, and biodegradable products available in the market and to consider better ways of managing their waste, empowering the public to make informed decisions.

To know more

Contact

Shubha. B.
Commissioner,
Belagavi City Corporation,
itstaff_ulb_belgaum@yahoo.com

Bricks Out Of Coconut Shell Waste: Karnataka's Chittapura Approach

Introduction

The Chittapura Town Municipal Council is working in the Kalabaurgi District in Karnataka to tackle the challenge posed by discarded coconut shells. Coconut shells are often dumped in dumpsites or landfills or incinerated, releasing harmful toxins and greenhouse gas emissions. The municipal council has also taken informed steps to collect, segregate, process, and repurpose the floral waste that generates in bulk during the Ganesha Festival.

Activities

The Chittapura Town Municipal Council processes the coconut shells by converting them into cocopeat bricks. Cocopeat from the coconut husks is salvaged and extracted, while the coconut husks are shredded in shredding machines, dried, screened, and mixed with water to make a durable solution. The materials are then fashioned into bricks, creating a zero-waste process. The municipal council is able to produce 20-25 bricks every month.

The floral waste is dealt with in a similar manner. Earlier, the flowers were mixed with the other wet waste that is generated during the festival. The municipal council has since taken the initiative to segregate the flower waste so that they may be used to create incense and dhoop sticks. The flowers are collected and dried, and thereafter mixed with sawdust and charcoal. Fragrance is added to the resulting mixture to increase its market value and consumer interest.

Integration with Circular Economy

The reuse of coconut husks and flower waste to create biodegradable products by the Chittapura Town Municipal Council is a step in the right direction to entrench the tenets of a circular economy within the state. The waste materials are completely used to create new products, extending their overall life-cycle, and avoiding their transportation to landfills or incinerators which are harmful methods of dealing with bulk waste.

Replicability and Scalability

This initiative is a good strategy that may be implemented to help coastal towns and cities to address their issues with the amount of coconut waste generated.

State/UT	Karnataka
Urban Local Body	Chittapura Town Municipal Council
Department/ Organisation	Chittapura Town Municipal Council
Duration	Ongoing

Impact

- The project also tackles the issue of source segregation, as well as integrates the important verticals of reuse, reduce, and recycle to help reduce the adverse impacts of waste on the environment.
- Both the cocopeat bricks as well as the incense and dhoop sticks are economically viable products that are sold in the market.

To know more

Contact

Sri Husamuddin KMAS
Chief Officer,
Chittapur Town Municipal Council,
itstaff_ulb_chittapur@yahoo.com

Ujjain's Floral Alchemy: From Temple Waste To Incense And Empowerment

Introduction

The Incense making plant in Ujjain aims to provide a sustainable solution for managing temple flower waste while generating economic and environmental benefits. The initiative prevents floral waste from polluting rivers and landfills by converting it into incense sticks, Gulal, and Dhoop Batti, and empowering local women through employment opportunities. Temple authorities, including Shri Mahakaleshwar Temple Management Committee, provide floral waste and support collection efforts. Ujjain Municipal Corporation facilitates waste management policies and infrastructure. Pushpanjali Eco Nirmit oversees collection, processing, and distribution of products.

Activities

The initiative aims to reduce temple floral waste by converting it into value-added products like incense sticks, Gulal, and Dhoop Batti, thereby promoting sustainability. A dedicated plant processes waste efficiently while creating employment for women Self-Help Groups (SHGs). Daily floral waste is collected from temples, sorted to remove non-biodegradable materials, and then dried and processed into powders. Essential oils are extracted for fragrance, and SHGs handle production using eco-friendly packaging. Products are distributed through temple shops and online platforms, supported by awareness campaigns encouraging responsible waste disposal.

Integration with Circular Economy

The initiative reinforces circular economy principles by recycling floral waste into high quality incense products, having high economic value.

Replicability and Scalability

The initiative has strong replication potential in temple cities like Varanasi, Haridwar, Mathura, and Ayodhya, where floral waste generation is significant. Expansion requires partnerships with local governments, NGOs, and religious institutions. Scalability can be achieved by increasing temple participation, diversifying product lines to include compost and herbal soaps, and strengthening e-commerce collaborations for nationwide sales.

State/UT	Madhya Pradesh
Urban Local Body	Municipal Corporation Ujjain
Department/ Organisation	Directorate of Urban Administration and Development, Madhya Pradesh
Duration	Operational since 2019

Impact

- Prevents floral waste from polluting rivers and landfills.
- Reduces greenhouse gas emissions and enhances biodiversity by minimising chemical pollutants in water bodies.

- Provides stable employment and financial independence through SHGs, thereby empowering women.
- Enhances entrepreneurial capabilities and skills of women involved in the initiative.
- Improves cleanliness and hygiene in temple premises, benefiting devotees and visitors.

- Boosts demand for raw materials, packaging, and distribution networks. Thus it boosts local economy.

To know more

Contact

Mr. Anand Parmar
Sub-Engineer cum Plant In-Charge,
Ujjain Municipal Corporation,
commujjain@mpurban.gov.in

Mr. Manpreet Singh Arora
Plant Owner,
Pushpanjali Eco Nirmit
pushpanjalieconirmit@gmail.com

Odisha Floral SHG's: Turning Waste to Valuable Products

State/UT	Odisha
Urban Local Body	Sambalpur Municipal Corporation
Department/ Organisation	Sambalpur Municipal Corporation, Swadhar Guru
Duration	Ongoing

Introduction

Sambalpur in Odisha has a vast cultural heritage, encompassing numerous temples and religious places of worship. Flowers offered at temples accumulate in large volumes as waste material raising serious concerns and challenges in their disposal. Sambalpur Municipal Corporation in collaboration with Punam SHG ideated and implemented a waste management and recycling scheme to convert floral waste to incense sticks (or agarbatis) and gulaal (a coloured powder, often red, that is used in festivals and religious rituals).

Activities

In order to initiate an effective and economically sustainable endeavour, the project was handed over to a Self-Help Group (SHG), consisting of locals from Swadhar Gruh (a safe home for victims of unfortunate circumstances, violence, and domestic abuse. Sambalpur Municipal Corporation set up a flower waste processing plant with a 200 kg/day intake and 100 kg/day processing capacity. SHG members received technical training for operations, marketing, and waste collection, supported by a Battery Operated Vehicle and Swaccha Sathis. Currently, over 8 kg of waste is collected daily from 28 temples through a structured route system. The waste collected is sorted and repurposed as incense sticks, gulaal, mosquito repellants, candles, and coco peat.

Integration with Circular Economy

This model is adherent to the principles of a circular economy for endeavouring to minimise waste, and also repurposing the same into biodegradable products within an economically viable blueprint.

Replicability and Scalability

This is a replicable model for cities that can similarly identify waste producing places of worship, and help mitigate pollution and its adverse environmental impact by staging a strong intervention.

Impact

- Recycling flower waste has helped minimise the amount of waste produced, thereby reducing land and water pollution and subsequently reduced the amount of greenhouse gases emitted.
- An empowering and income generating initiative, it has provided employment opportunities to the women that came together to form the SHG that has been dedicatedly involved in the same.

To know more

Contact

Geeta Das
President, Punam SHG

Bhagabati Sahu
Secretary, Punam SHG
sambalpurm.hud@nic.in

From Coconut Shell to Coir: Jharkhand's SHG Initiative

State/UT	Jharkhand
Urban Local Body	Ranchi Municipal Corporation
Department/ Organisation	Ranchi Municipal Corporation
Duration	ongoing

Introduction

Ranchi Municipal Corporation (RMC) has launched a waste management initiative to efficiently process green coconut shells that were previously indiscriminately dumped around the Ratu Road vegetable market, causing environmental and sanitation concerns. The initiative aims to achieve waste reduction and employment generation by converting discarded coconut shells into valuable, marketable products. This project promotes sustainable urban cleanliness while ensuring economic empowerment for local communities, particularly Self-Help Group (SHG) members.

Activities

A coconut shell processing machine has been installed at the Ratu Road vegetable market to systematically process waste generated from coconut consumption. The machine has a daily processing capacity of 5000 kg, significantly reducing organic waste accumulation and mitigating environmental pollution. The processed coconut waste is transformed into eco-friendly and commercially viable products, contributing to sustainable waste utilization.

Integration with Circular Economy

This initiative integrates circular economy principles through waste recycling, reuse, and value addition. By diverting green coconut shells from landfills, the project ensures that they are repurposed into products that enhance soil health and reduce dependency on chemical fertilisers.

Replicability and Scalability

This initiative is highly replicable in other cities and towns where large amounts of coconut waste are generated, particularly around fruit markets and vendor hubs. Future scalability can be achieved by expanding processing centers, strengthening SHG participation, and diversifying product lines into coir mats, compost, and bio-bricks. Establishing direct sales channels with agricultural and horticultural sectors will further enhance the project's economic viability.

Impact

- Reduces organic waste accumulation, minimizing landfill dependency.
- Supports soil enrichment and sustainable horticulture initiatives.
- Enhances public hygiene by reducing open dumping and mosquito breeding grounds.
- Creates livelihood opportunities for SHG members, fostering economic empowerment.
- Encourages community participation in waste management.
- Generates revenue through the sale of processed coconut-based products.
- Establishes a market-based sustainability model, reducing waste management costs.

To know more

Contact

Rupesh Ranian
City Manager-SBM
Ranchi Municipal Corporation,
support@ranchimunicipal.com.

Wat A Scrap': Transforming Leftover Fabrics Into Functional Products

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Corporation Jammu
Department/ Organisation	Housing & Urban Development Department
Duration	1 Year

Introduction

"Wat A Scrap" is an innovative upcycling brand founded by sisters Maansi and Jharna, with manufacturing units in Trikuta Nagar, Jammu, and Dehradun. The brand is committed to sustainability by repurposing leftover boutique fabrics from their own and other local boutiques. By transforming discarded fabrics into functional products, they significantly reduce textile waste and promote a circular economy.

Activities

The initiative focuses on transforming leftover boutique fabrics into high-quality, stylish fabric bags, providing an eco-friendly alternative to plastic. Boutique fabrics generally have rich textures and vibrant colors which are ideal for crafting unique and durable products. The process begins with sourcing and assessing fabrics to determine their best use, ensuring minimal wastage. Various bag styles, including tote bags, clutches, drawstring pouches, and cosmetic bags, are designed based on fabric patterns and textures. By integrating artisanal craftsmanship, the brand not only creates aesthetically appealing products but also adds value to what would otherwise be textile waste.

Integration with Circular Economy

"Wat A Scrap" successfully embodies circular economy principles by extending the lifecycle of textile waste. The initiative ensures that high quality fabric scraps are repurposed into functional products that reduces product dependency on raw materials. This initiative offers eco-friendly alternatives and additionally generates employment opportunities.

Replicability and Scalability

The "Wat A Scrap model" can be replicated in cities with a strong presence of boutiques and textile industries. As textile waste remains a major challenge for the industry, this initiative also has the potential to be scaled up by large textile powerhouses, further promoting sustainability and waste reduction.

Impact

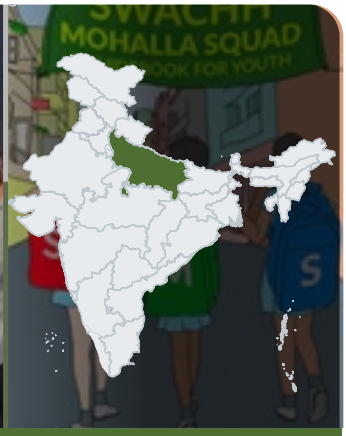
- "Wat A Scrap" significantly reduces textile waste and its associated ecological footprint. The initiative helps lower land, air, and water pollution by diverting waste from landfills. The brand's eco-conscious products encourage responsible consumption and align with the growing trend of sustainable fashion.
- The initiative supports the livelihood of artisans involved in the production process thereby generating employment opportunities. Each bag tells a unique story through its blend of colors and textures, appealing to consumers who value both style and sustainability.

To know more

Contact

Maansi Gupta
Founder
Wat a Scrap
justmaansi@gmail.com

Harnessing Horticulture Waste: Ghaziabad's Biochar & Wood Vinegar Revolution



State/UT	Uttar Pradesh
Urban Local Body	Ghaziabad Nagar Nigam
Department/ Organisation	Ghaziabad Nagar Nigam

Introduction

The Ghaziabad Nagar Nigam's horticulture waste processing initiative converts waste into valuable products like biochar and wood vinegar, enhancing soil fertility and promoting sustainable agriculture. Stakeholders include municipal authorities, agricultural communities, and environmental agencies. The project promotes recycling, minimizes waste, and offers cost-effective, eco-friendly alternatives to chemicals.

Activities

The waste management initiative includes an efficient system for horticulture waste collection and processing. Approximately 20 metric tons (MT) of horticulture waste is collected daily using 15–20 tractors, followed by shredding or chipping to facilitate efficient thermal treatment. The chipped waste is transferred to reactors for thermal processing. Then, it is heated in the absence of oxygen at elevated temperatures (e.g., 600°C) to produce biochar and syngas. After cooling, biochar is extracted, and wood vinegar is captured as a valuable byproduct for soil enhancement. Quality checks ensure these materials meet agricultural and environmental standards. The biochar and wood vinegar are distributed to local farmers, cooperatives, and horticultural enterprises, with training sessions to promote proper usage. A feedback loop is established. Revenue generation is driven by the sale of biochar, wood vinegar, and potential carbon credits. Earnings are reinvested to scale operations, improve technology, and expand the initiative's impact.

Integration with Circular Economy

The initiative focuses on recycling and reusing horticulture waste by converting it into valuable resources such as biochar and wood vinegar. Through thermal treatment, waste is transformed into high-quality agricultural inputs.

Replicability and Scalability

The model is adaptable and can be replicated through strong stakeholder engagement, including government support, active farmer participation, and robust partnerships with private enterprises and research institutions.

Impact

- Minimises landfill dependency and carbon emissions by diverting waste from open burning.
- Enhances livelihoods by creating jobs in waste processing and distribution, improves farmers.
- GNN can claim carbon credits for biochar production, with carbon credit prices ranging from USD 25 to 60 per metric ton. At a conservative estimate of USD 25 per MT, and considering that biochar yield is 25 percent of the input material, the total biochar output from 7,000 MT of waste would be 1,750 MT. This results in potential carbon credit earnings of USD 43,750 (1,750 MT × USD 25). Converting this at an exchange rate of INR 85 per USD, the carbon credit revenue amounts to INR 37,18,750.

To know more

Contact

Vikramaditya Singh Malik, IAS
Municipal Commissioner,
Ghaziabad Nagar Nigam
gzb.-nagar.nigam@gmail.com

Transforming Old Buses Into: Patna's Mobile Pink Toilets

Introduction

Patna Municipal Corporation (PMC) is repurposing End-of-Life Vehicles (ELVs) into mobile PINK Toilets by reusing, refurbishing, and redesigning them. Salvaging ELVs recovers valuable materials, reducing waste and promoting resource efficiency. These mobile toilets, deployable based on crowd density, shall promote employment while supporting environmental sustainability.

Activities

PMC identified scrapped buses, typically 10–15 years old, and repurposed them into mobile sanitation units, to include both Western and Indian toilet facilities, wash basins, and sanitary napkin vending machines. A mini café and rest area were also added at the back of each unit. To enhance visibility and hygiene awareness, the buses were painted and branded accordingly. Women-led groups were identified and trained to operate these mobile toilets They were also linked with various financial schemes to improve their livelihood prospects. To maintain hygiene qualities, regular monitoring mechanisms were also implemented.

Integration with Circular Economy

This initiative aligns with the principles of circular economy by refurbishing scrapped vehicles into sanitation facilities to promote environmental sustainability and enhance women's safety and hygiene. It extends the lifespan of the vehicle while mitigating hazardous waste generation. This approach also contributes to the minimization of environmental pollution, including air, soil, and water contamination, through the responsible disposal and reuse of vehicle components.

Replicability and Scalability

This initiative is suitable for densely populated urban areas with limited sanitation facilities, given the mobile and space efficient nature of PINK toilets. It can be scaled under Swachh Bharat Mission 2.0 and replicated by other Urban Local Bodies (ULBs) using scrapped municipal vehicles.

State/UT	Bihar
Urban Local Body	Patna Municipal Corporation
Department/ Organisation	Urban Development & Housing Department , Govt. of Bihar / Patna Municipal Corporation
Duration	2024- till date

Impact

- Prevents hazardous waste leakage from scrapped vehicles.
- Reduces greenhouse gas emissions linked to new vehicle manufacturing.
- Lowers landfill dependency through vehicle repurposing
- Provides safe and hygienic toilets for women.
- Encourages women's entrepreneurship through toilet and café management.
- Supports social inclusion and dignity for sanitation workers
- Cost-effective utilization of scrapped vehicles.
- Generates livelihood opportunities for women.

To know more

Contact

Arvind Kumar,
Solid Waste Management Expert
Patna Municipal Corporation
jnu_arvind@rediffmail.com

Leh's Art: Repurposing Industrial Scrap Metals

Introduction

The Ladakh UT Administration embarked on an innovative project to repurpose industrial waste into artistic creations, fostering sustainability while promoting artistic expression. Through the development of waste hubs, scrap metals and other industrial by-products are transformed into sculptures, aligning with circular economy principles. This initiative not only addresses waste management challenges but also enhances cultural and artistic engagement within the region.

Activities

To facilitate the upcycling of industrial scrap, the Ladakh UT administration has established waste hubs in Ladakh. These hubs serve as creative centres where artists and sculptors can access discarded industrial materials to craft sculptures and other artistic pieces.

A key milestone of the initiative was the organisation of the 1st Ladakh National Scrap Art Symposium. Hosted by the Directorate of Urban Local Bodies, the event brought together 15 artists and sculptors. Through hands-on workshops, participants explored the potential of industrial scrap materials to create unique works of art.

The final sculptures produced during the symposium were publicly displayed near the NDS Stadium in Ladakh during the Youth-20 (Y-20) Summit in 2023. This exhibition provided an opportunity for visitors, delegates, and the local community to appreciate the artistic and environmental significance of upcycling industrial waste. The initiative also gained recognition at the national level when the Hon'ble Minister of Power and Housing and Urban Affairs visited the exhibition during an official tour to Ladakh in November 2024.

Integration with Circular Economy

This initiative exemplifies circular economy principles by promoting the recycling and reuse of industrial waste. The transformation of scrap metal into sculptures not only reduces landfill waste but also adds cultural and economic value. By extending the lifecycle of industrial materials, the project minimises the need for new raw material extraction.

Replicability and Scalability

The model can be replicated in other regions with high volumes of industrial waste where more artists and communities can engage in sustainable upcycling practices. The expansion of upcycling workshops and permanent public art displays can foster economic growth and promote tourism.

State/UT	Ladakh
Urban Local Body	Leh
Department/ Organisation	Directorate of Urban Local Bodies, Ladakh
Duration	Initiated in 2023

Impact

- The upcycling of scrap metals significantly reduces waste sent to landfills, thereby minimising environmental pollution.
- By repurposing discarded materials, the project mitigates greenhouse gas emissions associated with raw material extraction and waste disposal. Furthermore, by preventing waste accumulation in natural ecosystems, the initiative contributes to biodiversity preservation.
- The initiative fosters creative engagement, raises environmental awareness, and provides local artists with a platform to showcase their work. The public display of upcycled sculptures also enhances the visual and cultural appeal of urban spaces.

To know more

Contact

Moses Kunzang
Director Urban Local Bodies, Ladakh

Stanzin Rabgais
Executive officer
Municipal Committee, Leh
dulbladakh@gmail.com

Bricks from Bottles: Dharmanagar's Innovative Glass Recycling Initiative

Introduction

The Dharmanagar Municipal Council in North Tripura district has introduced an initiative under the RRR (Reduce, Reuse, Recycle) program to repurpose glass waste, particularly glass bottles, instead of disposing of them. This practice not only contributes to waste management but also supports sustainable infrastructure development within the community.

Activities

The Council's glass recycling initiative involves several key activities aimed at repurposing glass waste. First, regular waste collection services gather glass bottles from residential and commercial areas, ensuring they are separated from general waste for proper handling. Once collected, the bottles are crushed into a fine, sand-like dust, making the glass waste manageable for reuse. This crushed glass is then mixed with sand and cement in a specific ratio to create a strong, durable mixture suitable for construction. The resulting sand-cement-glass dust mixture is molded into bricks, which are used in various infrastructure projects managed by the council, such as compost pit walls and plinth drains. A dedicated team of four workers oversees the entire process, ensuring the quality of the bricks and the smooth operation of the recycling initiative. This systematic approach promotes the development of eco-friendly infrastructure within the community.

Integration with Circular Economy

This initiative promotes circular economy by repurposing waste materials, reducing landfill pressure, and minimizing the need for new raw materials, thus conserving natural resources.

Replicability and Scalability

The program can be replicated in other urban areas, with potential to expand to include a greater variety of construction materials made from recycled glass. Efforts to raise public awareness and explore partnerships can further enhance the initiative's impact.

State/UT	Tripura
Urban Local Body	Dharmanagar Municipal Council
Department/ Organisation	Local Self Government Department

Impact

- Significantly reduces the volume of glass bottles discarded as waste, minimizing landfill pressure.
- Reduces the need for new raw materials in the construction industry, such as sand, contributing to resource conservation.
- Provides an environmentally friendly alternative to traditional building materials and promotes long-term sustainability.
- Creates employment opportunities for local workers, contributing to the community's economy.

To know more

Contact

Sajal Debnath
Chief Operating Officer
Dharmanagar Municipal Council
cmm.dmc.mis@gmail.com
nagartripuradmn@gmail.com

Creating A Circular Loop: Jammu And Kashmir Tackles Organic Waste

Introduction

Samast Eco-Alternatives has launched a sustainable initiative in Jammu and Kashmir to address the issue of accumulated animal dung, and floral waste generated in temples. This project is crucial as untreated cow dung and floral waste often contaminate water bodies. Concurrently, the organisation targets the twin objectives of women's empowerment while also fostering a reduced dependency on single-use plastic products within the community, especially during the festival season.

Activities

Samast Eco-Alternatives has particularly intervened in rural areas where cow dung and floral waste are abundant and often underutilised. They have developed and implemented a unique approach that transforms cow dung and floral waste into rich resources used to create biodegradable products. The cow dung is incinerated to yield ash that can additionally be used as an effective insecticide or fertiliser. The residue is sun-dried and moulded into the desired leak-proof products, using no chemical additives in what is a completely zero-waste procedure. These items include diyas, pots, cow dung logs, and other decorative articles that have since replaced single-use plastics and other unsustainable materials in Jammu and Kashmir. Floral waste is also likewise processed, shredded, and powdered to enable its recycling and reuse as incense sticks, that are ripe for distribution in the market.

Integration with Circular Economy

The waste generated from animals and religious institutions are processed and effectively reused to make new biodegradable products. This initiative promotes environmental sustainability and serves as a replicable model for other regions facing similar waste management challenges.

Replicability and Scalability

The initiative can be replicated in many rural areas where cow dung and floral waste pose a challenge.

State/UT	Jammu & Kashmir
Urban Local Body	Jammu Municipal Corporation
Department/ Organisation	Samast Eco-Alternatives Private Limited
Duration	2021-Ongoing

Impact

- This initiative minimises the waste sent to landfills, reduces land and water pollution, and encourages active community participation.
- This scheme has generated employment for several rural women and artisans, providing them with a steady income. Till date, more than 200 rural women have received training through the project to successfully implement its targets.
- Samast Eco-Alternatives has conducted workshops in different schools, colleges, and institutions to equip participants with the necessary skills required for creating sustainable alternatives to non-biodegradable products.
- This initiative has empowered the community, especially its women, to take a more active and informed stance with respect to its underutilised waste.

To know more

Contact

Rajat Salgotra
Director
Samast Eco-Alternatives Private Limited
salgotra.rajat94@gmail.com

The COCO Approach: Udaipur's Waste Management Initiative

Introduction

The Nagar Nigam Udaipur has initiated a project focused on converting coconut shells into reusable products, specifically Rope and COCO Pit. This initiative aims to compost wet waste generated by the Urban Local Body (ULB) while also creating art from scrap and metal components. The key stakeholders involved are Trassonomy Private Limited and Nagar Nigam Udaipur.

Activities

The project has completed its milestone by achieving the production of reusable products from 30 tons of scrap and waste metal components. In addition, it has utilized approximately 20 tons of wet waste, resulting in the production of 8 tons of COCO Pit and 6 tons of Rope. This dual approach promotes waste reduction and also creates valuable products that contribute to environmental sustainability.

Integration with Circular Economy

The initiative integrates circular economy principles by reusing waste materials for the production of valuable products.

Replicability and Scalability

The project demonstrates a potential for replication in other urban areas that prioritize waste management and resource recovery. By adopting similar practices, other cities can effectively manage their waste while generating valuable products. Additionally, there is considerable scalability in the initiative, as it can be expanded to include the production of charcoal from the processed waste, further enhancing resource utilization and contributing to sustainable practices in waste management.

State/UT	Rajasthan
Urban Local Body	Nagar Nigam Udaipur
Department/ Organisation	Nagar Nigam Udaipur
Duration	From 2021

Impact

- The project has established a Memorandum of Understanding (MOU) with Trassonomy Private Ltd., generating an annual royalty of 12 lakhs and 50 percent commercial user charges.

To know more

Contact

Lakhan Lal Bairwa
Executive Engineer,
Nagar Nigam Udaipur
comm.udr@gmail.com

WASTE-TO-WONDER

Blending resourcefulness, sustainability and creativity into one, India's waste-to-wonder outlook finds artistic expression in discarded materials. Imbibing the principle of "one man's trash is another man's treasure", artists, engineers, and inventors of all ages across the country have created sculptures, installations, artistic attractions, and other valuable imaginative and inventive crafts by recycling discarded scrap materials, such as metals, paper, plastic, cardboard, wood, glass, and rubber. While this is a sustainable practice rooted in the principles of reuse, reduce, and recycle, the installations also help engage local communities through increased visibility. It raises awareness about the problems of proliferating waste materials, the importance of source segregation, and the imperative of mindful consumption across all sectors.

Waste to Art Project: How UP Darshan Park Champions Circular Economy

Introduction

The UP Darshan Park, developed under the Waste to Art Project, exemplifies circular economy principles by transforming scrap materials into artistic and educational attractions.

Activities

The park features replicas of renowned monuments from Uttar Pradesh, diverting over 260 tons of waste from landfills while promoting sustainability and public awareness about recycling. The key stakeholders in this initiative include the government, which provided the land for the park, and the municipality, which managed waste procurement. Additionally, a team of 15 artists, skilled welders and architects and artists played a crucial role in designing and developing the park, transforming waste materials into artistic and cultural landmarks.

Integration with Circular Economy

The project repurposed 350 tons of waste, including metal scraps, wood, rolling shutters, e-waste, and iron scraps. An onsite waste segregation system was established to categorize waste into dry, wet, and horticultural waste, ensuring efficient sorting and processing. Additionally, recycling and composting practices were implemented to manage park-generated waste sustainably, further promoting environmental responsibility.

Replicability and Scalability

The model can be replicated in other cities to develop waste-to-art parks, improving urban aesthetics, promoting sustainability, and contributing to Swachh Bharat Abhiyan rankings. The project's scalability allows expansion using various waste materials to create cultural and artistic landmarks.

State/UT	Uttar Pradesh
Urban Local Body	Lucknow Municipal Corporation
Department/ Organisation	Ztech limited.
Duration	7 Months

Impact

- Waste diversion from landfills, leading to a reduced carbon footprint.
- Majority of the park operates on solar power, reducing dependence on fossil fuels.
- Onsite composting pit and an in-house waste segregation system categorize waste into dry, wet, and horticultural waste.
- Dry waste collected is consigned back to the municipality for further processing.
- Promotes global sustainability goals by educating the public on waste recycling and cultural conservation.
- The tourism sector benefits from increased visitor engagement.

To know more

Contact

Mr. Ajay Kumar Singh
GM (Project),
Lucknow Smart City
lkosmartcity@gmail.com

Musical Square: Refurbishing Ghaziabad's Scrap Waste

State/UT	Uttar Pradesh
Urban Local Body	Ghaziabad Nagar Nigam
Department/ Organisation	Ghaziabad Nagar Nigam

Introduction

Ghaziabad Municipal Corporation has established the Musical Square, an innovative landmark where musical models crafted from scrap materials create a stunning visual and auditory experience. Inspired by a musical theme, this square has gained immense popularity among locals, becoming a bustling attraction. It not only promotes a message of cleanliness but also exemplifies the principles of RRR—Reduce, Reuse, Recycle. By incorporating sustainable practices, this initiative encourages eco-friendly living, enhances public awareness of waste management, and contributes to a cleaner, greener Ghaziabad, benefiting the community as a whole. The Ghaziabad Municipal Corporation (GMC) leads the project with support from local artists, recycling vendors, community organisations, and environmental agencies.

Activities

The Musical Square near Vasundhara features murals, installations, and soundscapes, with instruments like Rudra Veena, Nagarda, Veena, Tabla, Tordi, and Dhol, all crafted from scrap materials. Each installation highlights traditional Indian music, from the deep beats of the Nagarda to the rhythmic Tabla and folk instruments like Tordi and Dhol. Interactive elements such as QR codes provide educational content on waste management. The space also serves as a venue for cultural events and performances promoting cleanliness and sustainability. Regular maintenance ensures safety and longevity, while public feedback helps refine the initiative.

Integration with Circular Economy

Waste and scrap materials are repurposed into artistic installations, transforming discarded items into valuable public assets. These cultural and educational artifacts promote sustainability while enhancing community spaces.

Replicability and Scalability

The project can scale through geographical expansion, establishing creative spaces in more urban areas, and enhancing collaborations with local artists, cultural institutions, and waste management firms.

Impact

- Reduces landfill waste, promotes recycling, and minimizes the environmental footprint.
- Cost-effective use of scrap materials reduces project expenses while promoting local industry.

To know more

Contact

Vikramaditya Singh Malik, IAS
Municipal Commissioner,
Ghaziabad Nagar Nigam,
gzb.-nagar.nigam@gmail.com

Delhi's Bharat Darshan Park: Transforming Scrap into Artistic Wonders

Introduction

MCD has developed Bharat Darshan Park as a unique waste-to-art initiative. Based on the 3R principles of Reduce, Reuse, and Recycle, this project utilizes approximately 350 MT of scrap materials, including old vehicles, iron rods, electric poles, and other abandoned items.

Activities

Spread across 8 acres, Bharat Darshan Park features 21 replicas of India's iconic monuments, such as Qutab Minar, Taj Mahal, Charminar, Gateway of India, Konark Temple, Mysore Palace, and more. A central Banyan Tree represents the Bodhi Tree, adding symbolic significance to the park's artistic landscape. The initiative has involved multiple stakeholders, including tourists, zonal officials, artists, and the horticulture department, ensuring collaborative development and maintenance. The project promotes Swachhata se Sundarta (beauty through cleanliness), Swadesh Darshan (domestic tourism), and Skill Development, reinforcing the cultural and environmental impact of waste repurposing.

Integration with Circular Economy

The park exemplifies the integration of circular economy principles through its Waste-to-Wealth and Waste-to-Art models, creating both aesthetic and economic value. It reuses and repurposes discarded materials, and recycles scrap components into visually appealing and culturally significant structures.

Replicability and Scalability

The Waste-to-Wonder Park model can be replicated by other Urban Local Bodies (ULBs) by utilizing their accumulated scrap materials from old vehicles, seized hoardings, and other items. This approach provides an innovative way to manage waste while creating public spaces that generate economic and social benefits.

State/UT	Delhi
Urban Local Body	Municipal Corporation of Delhi (MCD)
Department/ Organisation	Department of Environment and Management services
Duration	Since Dec 2021

Impact

- Reduces landfill burden and the environmental impact of scrap disposal.
- Mitigates waste toxicity and promotes eco-friendly urban planning.
- Enhances public awareness of recycling and artistic reuse of waste.Promotes domestic tourism and cultural preservation.
- Generates revenue through visitor entry fees, with daily earnings reaching up to ₹8,50,000.
- Expected annual revenue of ₹15,00,00,000, making the initiative financially self-sustaining.

To know more

Contact

Vandana Rao, IAS
Deputy Commissioner, City SP,
Municipal Corporation of Delhi
mcdswachhsurvekshan@gmail.com

Studio Kilab's Sustainable Craft Innovation in Srinagar

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Corporation Srinagar
Department/ Organisation	Housing & Urban Development Department
Duration	1 Year

Introduction

Studio Kilab (Kashmir Innovation Lab) is a multi-disciplinary design studio dedicated to blending traditional craftsmanship with contemporary design to tackle socio-economic challenges. The initiative collaborates with artisans to refine techniques and create modern craft-based products suited for today's markets. The studio not only preserves Kashmir's renowned papier-mâché heritage but also establishes a sustainable and ethical supply chain that benefits artisans and B2B brands.

Activities

Studio Kilab operates at the intersection of tradition and modernity, leveraging design thinking to empower local artisans and boost economic opportunities. The studio produces innovative craft items such as papier-mâché switchboards, bluetooth speakers, furniture, lighting, mementos, and decorative pieces, all made with sustainable materials. The initiative enhances material efficiency and offers a dignified livelihood for artisans by optimising traditional production techniques. To reinforce sustainability, Studio Kilab has also established a papier-mâché cooperative that converts discarded paper into high-value artisanal products. This approach promotes waste reduction, resource efficiency, and a closed-loop production system where waste materials are repurposed into functional and artistic goods.

Integration with Circular Economy

Studio Kilab embraces circular economy principles by reducing reliance on raw materials and promoting resource efficiency. The cooperative ensures that waste paper is transformed into high-quality products, minimising landfill contribution. By integrating local artisans into sustainable production cycles, the initiative extends the lifespan of raw materials while fostering eco-conscious consumer behaviour

Replicability and Scalability

The Studio Kilab model can be replicated in cities that have strong artisan networks. By integrating NGOs and community-driven efforts, similar initiatives can expand into new regions.

Impact

- Studio Kilab's initiative significantly reduces paper waste, which directly affects land and water pollution. Additionally, the reduced demand for raw materials lowers carbon emissions associated with production and waste disposal, contributing to a cleaner environment. The initiative also promotes responsible consumption by encouraging buyers to support eco-friendly products.
- The project creates employment in the recycling, upcycling, and sustainable design sectors, fostering economic resilience among artisans.

To know more

Contact

Burhan Ud Din Khateeb
Founder,
Studio Kilab
studiokilab@gmail.com

Prayagraj's Shivalaya Park: A Heritage Reimagined

Introduction

Shivalaya Park, a unique "Waste-to-Wonder" destination in Prayagraj, Uttar Pradesh, spans over 11 acres, blending sustainability, culture, and spirituality. With 22 spectacular replicas of renowned temples, such as Jyotirlingas and other significant Hindu structures, the park honours India's rich spiritual legacy while raising awareness of environmental issues. A wide range of stakeholders played a key role in the initiative. The Prayagraj Municipal Corporation led the project, collaborating with artists, artisans, private partners, and urban planners. The local community actively participated in its development, and the Public-Private Partnership (PPP) model ensured efficient execution and long-term sustainability.

Activities

A team of artists and artisans repurposed over 450 tonnes of waste to create 18 mega temples and various installations. Sourced from the municipal corporation, these materials—including old truck and car parts, electric poles, pipes, iron rods, household items, and other scrap pieces—were diverted from scrapyards and landfills, helping to preserve the urban environment. Additionally, construction debris was reused to build retaining structures. The completed park, featuring landscaping, gardens, and recreational activities, not only provides a lush green space for families to enjoy but also generates revenue for the corporation, truly embodying the concept of Waste to Wealth.

Integration with Circular Economy

The reuse of 450 tonnes of scrap material aligns with circular economy principles, reducing landfill waste while promoting recycling. Its self-sustaining financial model—based on ticketing, lease rentals, and advertising revenue ensures continued maintenance and further expansion.

Replicability and Scalability

Shivalaya Park can be replicated in other cities due to its sustainable design, revenue generation, and public engagement. Developed under a PPP framework, it ensures long-term financial and operational sustainability. Additionally, the project fosters employment in various sectors, contributing to local economic growth.

State/UT	Uttar Pradesh
Urban Local Body	Prayagraj Municipal Corporation
Department/ Organisation	PWD, Prayagraj Municipal Corporation
Duration	4 months

Impact

- Repurposed over 450 tonnes of scrap into sculptures, reducing landfill waste. The India-shaped reservoir aids rainwater harvesting, while Sanjeevani Van enhances air quality and biodiversity.
- Creates employment in construction, maintenance, and hospitality sectors.
- Generates revenue through ticket sales, lease rentals, and advertisements, ensuring self-sustainability.

To know more

Contact

Abinash Sahoo
Senior Consultant
PWD, Prayagraj Municipal Corporation
env.prayagraj@gmail.com

Punjab's Recyclable Cafe: A Waste-to-Wonder Business Model

Introduction

Waste transformation initiatives aim to promote sustainability by converting discarded materials into valuable products. Initiatives such as Waste to Wonder, Best Out of Waste, and Recyclable Cafés were taken, to reflect the potential of upcycling waste into artistic and functional items.

Activities

The initiatives engage with schools, artists, and NGOs in repurposing waste into sculptures and functional products, turning discarded materials into pieces of art or useful items. The Recyclable Café in Model Town, is a prime example of sustainable business integration, where waste management is embedded into everyday consumer experiences. It also provide employment opportunities for artisans and small businesses that specialise in upcycling waste. Educational workshops and exhibitions further reinforce the significance of recycling and sustainable consumption, encouraging individuals to incorporate these practices into their lifestyles.

Integration with Circular Economy

Instead of following the traditional "take-make-dispose" model, these projects emphasise reuse, refurbishment, and recycling. Artistic upcycling reduces the need for raw materials, And businesses such as Recyclable Cafés serve as models for sustainable entrepreneurship, demonstrating how commercial ventures can be both profitable and environmentally responsible.

Replicability and Scalability

These initiatives can be replicated by encouraging public-private partnerships, engaging artists and businesses, and leveraging policy incentives. Scaling up requires investment in upcycling infrastructure and increased awareness campaigns.

State/UT	Punjab
Urban Local Body	Municipal Corporation Patiala
Department/ Organisation	Municipal Corporation Patiala
Duration	2021-Ongoing

Impact

- Contributes to a reduction in landfill waste, leading to lower waste management costs and decreased environmental pollution.
- Drives behavioural change, foster community participation, and create employment in waste-based industries.
- Providing new revenue streams and job opportunities, particularly for small-scale artisans and self-help groups.

To know more

Contact

Sh. Aditya Dachalwal, I.A.S
Commissioner,
Municipal Corporation Patiala
cmc_patiala@yahoo.com

Sculpting a Sustainable Future: The 3R Initiative by Sabroom Nagar Panchayat

State/UT	Tripura
Urban Local Body	Sabroom Nagar Panchayat
Department/ Organisation	Sabroom Nagar Panchayat

Introduction

The Sabroom Nagar Panchayat has made progress in promoting sustainable waste management by embracing the principles of Reduce, Reuse, and Recycle. Through innovative and community-driven efforts, various initiatives—including sculptures from old and unusable utensils, statues from old plastic bottles, wrappers, and clothes, and a wall garden using old plastic bottles as pots—have been implemented to minimize waste, enhance environmental sustainability, and raise awareness among the public about the importance of responsible waste disposal. By turning waste materials into useful and aesthetic structures, the Sabroom Nagar Panchayat aims to foster a culture of environmental responsibility and resourcefulness.

Activities

One of the notable projects involves repurposing old unusable utensils into artistic sculptures that beautify public spaces while encouraging recycling. Additionally, a striking butterfly statue created from old plastic bottles, wrappers, and clothes serves as a captivating representation of the potential to transform waste materials into art, thereby educating the community about the importance of upcycling. Furthermore, a vertical garden has been developed using repurposed plastic bottles as pots, which not only encourages sustainable gardening practices but also optimizes space utilization in urban areas. Together, these initiatives foster a culture of environmental responsibility and creativity within the community.

Integration with Circular Economy

The initiatives align with circular economy principles by converting waste into valuable resources, reducing landfill usage, and promoting sustainable practices among community members.

Replicability and Scalability

The initiatives can be replicated in other urban areas, inspiring communities to adopt similar practices that promote creativity and sustainability in waste management.

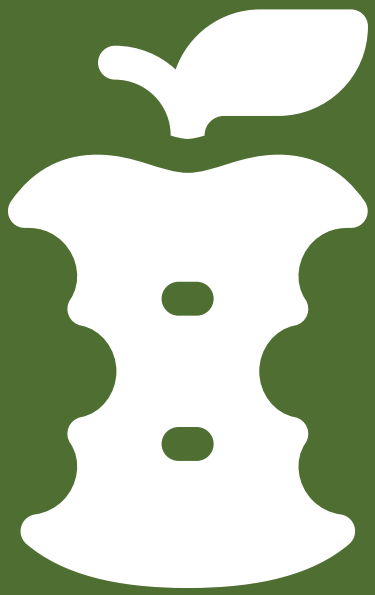
Impact

- Reduces metal and plastic waste in the community.
- Beautifies public spaces, fostering community pride and environmental stewardship.
- Raises public awareness about the importance of recycling and responsible waste disposal.
- Encourages participation from local artisans and residents, strengthening community bonds.

To know more

Contact

Shibajyoti Dutta
EO,
Sabroom Nagar Panchayat
sabroomnagarpanchayat@gmail.com



WET WASTE MANAGEMENT

Wet or organic waste constitutes a large proportion of our daily waste stream, across industrial, commercial, and domestic spaces. Effective organic and wet waste management is crucial for achieving a sustainable urban environment. Emphasis on source segregation by using differently coloured bins for wet and dry waste (green and blue respectively) has enabled improved waste management across states, even at the household level. The Hon'ble Prime Minister Shri Narendra Modi's Mission LiFE promotes a lifestyle that protects the environment through individual actions. For organic and wet waste, methods like composting are gaining prominence. Initiatives like the India Organic Waste Management Programme (IOWMP) have successfully implemented innovative biogas technologies to enhance waste management and energy production in rural and urban areas. By integrating these practices into our daily lives and leveraging government initiatives such as the Swachh Bharat Mission, India can effectively manage organic waste, reduce environmental impacts, and foster a more sustainable future.

Aizawl's Home Compost: An Economic Intervention

Introduction

The initiative promotes home composting, facilitates the conversion of wet waste into nutrient-rich compost, and integrates a waste-to-wealth approach. It seeks to reduce landfill dependency and foster sustainable waste management practices.

Activities

The Aizawl Municipal Corporation (AMC) has launched a comprehensive home composting campaign. By collaborating with various stakeholders it encourages residents to compost waste at home thereby minimizing the burden on municipal waste collection systems. AMC has partnered with farmers to repurpose specific types of organic waste to reduce organic waste disposal challenges. They have closely worked with 85 LocalCouncils . After collection, the wet waste is shredded fromlarger organic matter. The controlled decomposition using windrow composting techniques, ensures optimal moisture levels and aeration for efficient breakdown. After the compost is mature, it is screened to eliminate contaminants, packaged in standardized bags, and sold at the AMC office. AMC also regularly organises training sessions for residents, farmers, and self-help groups (SHGs) to provide practical knowledge on composting techniques and sustainable waste management. A monitoring mechanism has been established to ensure that the initiative remains on course and meets its sustainability objectives.

Integration with Circular Economy

By analysing waste material value, the project strengthens circular economy principles. This project reduces environmental impact while generating economic benefits. By promoting home composting, the initiative minimizes landfill dependency and closes the waste loop. The composting process not only reduces greenhouse gas emissions but also enriches sustainable agriculture. Therefore, the project strengthens local economies while promoting long-term environmental resilience.

Replicability and Scalability

The adaptable nature of this model makes it highly replicable for various urban bodies. Cities can customize the program based on their specific waste management needs by involving community based organisations. Expanding the initiative's reach can substantially enhance community participation and further strengthen sustainable waste management practices across diverse scale.

State/UT	Mizoram
Urban Local Body	Aizawl Municipal Corporation
Department/ Organisation	Aizawl Municipal Corporation
Duration	1 Year

Impact

- The initiative plays a significant role in conserving resources by converting organic waste into a useful product.
- This contributes to a reduction in greenhouse gas emissions, improving air quality and lowering environmental pollution.
- The initiative fosters community participation, creating awareness about responsible waste management and promoting environmentally friendly practices at the household level.

To know more

Contact

K. Vanlalruata
Deputy Municipal Commissioner,
Aizawl Municipal Corporation
amcmizoram@gmail.com

Wet Waste Management: Srinagar's Weed Processing Plant

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Committee Srinagar
Department/ Organisation	Municipal Committee Srinagar
Duration	1 Years

Introduction

The Dal and Nigeen lakes, covering 25.01 sq. km, form a thriving ecosystem with around 50 species of plants and animals. As a shallow, nutrient-rich water body, the lake supports extensive aquatic plant growth. While vegetation helps absorb pollutants, excessive weed growth, particularly invasive species like lilies, poses environmental and aesthetic challenges.

Activities

Due to anthropogenic pressures, invasive weeds have spread across the lake, which impacts water quality and navigation. To manage this, both mechanical and manual interventions have been ongoing for years to maintain the lake's ecosystem and aesthetics. However, scientific disposal of harvested weeds remained a concern. To address this, an MoU is signed for the proper processing and disposal of lake weeds. This initiative ensures that weeds collected from the water bodies are processed in an environmentally sustainable manner.

Integration with Circular Economy

The plant is designed to not only remove pollutants but also transform them into useful products. Harvested weeds are processed to create organic manure, turning waste into a valuable resource. This approach supports a sustainable waste management system by reintegrating biological waste into productive use.

Replicability and Scalability

This model can be replicated in other urban local bodies where water bodies are affected by invasive weeds. By adopting similar weed processing plants, municipalities can efficiently manage aquatic vegetation while promoting environmental sustainability and economic benefits.

Impact

- Processing weeds reduces landfill waste and minimizes pollution, improving water quality and maintaining the lake's ecosystem.
- Converting weeds into bio-fertilizers creates economic opportunities for farmers and entrepreneurs, generating revenue and reducing dependency on chemical fertilizers.
- The initiative promotes local economic development, creates jobs, and encourages sustainable agricultural practices.

To know more

Contact

Zahid Sajad, JKAS
Chief Executive Officer,
Municipal Committee Srinagar
eomckulgam@gmail.com

Waste to Compost: Qazigund's Sustainability Journey

Introduction

The project aims to conserve resources and promote environmental sustainability. The initiative focuses on establishing an efficient waste management system by promoting source segregation, composting organic waste, and recycling non-biodegradable materials.

Activities

Door-to-door waste collection ensures segregation at the source, enabling proper disposal and processing. A Material Recovery Facility (MRF) has been established to sort and process recyclable materials efficiently. Organic waste is converted into nutrient-rich fertilizer at composting units, reducing landfill dependency. Community awareness programs are actively conducted to educate the public on circular economy principles. Additionally, the initiative collaborates with registered Self-Help Groups (SHGs) to produce and distribute jute bags as a sustainable alternative to plastic.

Integration with Circular Economy

The initiative contributes to a circular economy by ensuring minimal waste generation and maximum resource recovery. Dry waste is systematically sorted and sent for recycling which reduces landfill waste. Used furniture and electronics are repaired and then resold, promoting resource efficiency. Organic waste is processed into high-quality fertilizer, benefiting local farmers by reducing dependence on chemical fertilizers.

Replicability and Scalability

This model can be implemented in other municipal committees with proper planning and execution. This initiative also leverages local resources and community engagement. Strengthening partnerships with recycling industries and organizations will enhance waste management efficiency. Increased educational campaigns and community participation will further reinforce sustainable practices and ensure long-term success.

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Committee Qazigund
Department/ Organisation	Municipal Committee Qazigund
Duration	Since 2023

Impact

- The initiative encourages waste segregation, reducing overall waste generation and preventing leachate contamination from unsegregated waste dumping.
- Composting organic waste lowers the carbon footprint and decreases reliance on landfills, promoting a sustainable waste management system.

To know more

Contact

Mohammad Irfan Wani
Executive Officer,
Municipal Committee Qazigund
eomcqazigund@gmail.com

Poultry Waste Management: Kerala's Rendering Plants

State/UT	Kerala
Urban Local Body	All ULBs Across Kerala
Department/ Organisation	Haritha Kerala Mission, Suchitwa Mission, LSGD in association with private partners
Duration	Since 2019

Introduction

Kerala state has more than 16,000 poultry stalls where approximately 18,00,000 poultry are slaughtered and sold daily and it is estimated that about 1,080 TPD of poultry waste is produced daily. To address this, the state introduced a scientific approach to poultry waste management through rendering plants under a public-private partnership (PPP) model. These plants process poultry waste into valuable products, ensuring sustainability and economic viability. The key stakeholders were Haritha Kerala Mission, Suchitwa Mission, Local Self Government Department (LSGD) in association with private partners.

Activities

Rendering plants have been established in partnership with private investors., along with District Level Facilitation and Monitoring Committees (DLFMCs) to ensure compliance. These plants process poultry waste, including feathers, by steaming and cooking it into a powdered form, which serves as a valuable raw material for fish and animal feed. Additionally, a maximum collection fee of ₹7 per kilogram is charged to make the service affordable and ensure widespread participation.

Integration with Circular Economy

Poultry and fish farming are major economic activities in Kerala, and the rising number of domesticated pets has increased the demand for animal feed. This initiative efficiently connects poultry waste management with the animal and fish feed industry. By converting poultry waste into a useful feedstock for animal and fish feed, this initiative reduces waste disposal issues while promoting resource efficiency and sustainability.

Replicability and Scalability

The first rendering plant was set up experimentally in Pappinissery, Kannur, in 2019, and after its success, the LSGD issued detailed guidelines called "Guidelines For Licensing Poultry Meat Stalls and Poultry Waste Rendering Plants" in October 2021. This was done to facilitate expansion to all Local Self Government Institutions (LSGIs). Since then, 39 rendering plants have been established across various districts.

Impact

- Reduction in improper poultry waste disposal, mitigating pollution risks. This will lead to decrease in landfill burden by diverting poultry waste to productive use.
- The initiative ensures safe and hygienic waste disposal, reducing health risks in local communities. Creation of employment opportunities in waste management and feed production sectors.
- There are 39 operational rendering plants with a total capacity of 898.25 TPD effectively handling poultry waste. The initiative provides a steady source of raw materials for the animal and fish feed industry, generating economic benefits.

To know more

Contact

Mr. Gokul Prasannan
PMU Kerala, IEC Expert-PMU
sanitationkerala@gmail.com

Leaf to Life: Kota's Sustainable Composting Initiative

Introduction

The Municipal Corporation of Kota (South) operates a Leaf Compost Plant situated at Chambal Garden, designed to efficiently process garden waste. This Leaf Composting Unit initiative aims to utilize garden waste including leaves for the production of vermi-compost, promoting sustainable waste management practices within the community. The key stakeholders in this initiative are Municipal Corporation of Kota (South), farmers & residents of Kota City.

Activities

This facility boasts of a processing capacity of 10 tons per day and has 12 leaf beds, each with a capacity of 19.14 cubic meters with a leaf bed ripening time of 4 months. Additionally, the plant includes a leaf culture pit with each leaf bed capable of holding up to 9500 kg of leaves. After the ripening process, the compost produced achieves a density of 500 kg per cubic meter, effectively transforming organic waste into valuable vermi-compost for the community.

Integration with Circular Economy

The initiative supports the recycling of leaf waste generated from parks and gardens under the Municipal Corporation's jurisdiction, facilitating the production of valuable vermi-compost.

Replicability and Scalability

The Leaf Composting Unit can be replicated and scaled up by installing similar plants utilizing the same technology in major cities across the state.

State/UT	Rajasthan
Urban Local Body	Municipal Corporation Kota (South)
Department/ Organisation	Local Self Government Department
Duration	Since August 2021

Impact

- The project positively impacts the environment by reducing greenhouse gas emissions, such as CO_2 and methane.
- IThe compost produced is sold directly in the market through the Municipal Corporation's own shop, priced at INR 7 to INR 8 per kg.

To know more

Contact

Anurag Bhargava
Municipal Commissioner,
Nagar Nigam Kota (South)
anuragbhargava2009@gmail.com

Wet Waste Innovation: Jharkhand's Sustainable Waste Management

State/UT	Jharkhand
Urban Local Body	Jugsalai Nagar Parishad
Department/ Organisation	Urban Development & Housing Government of Jharkhand / Jugsalai Nagar Parishad, Jamshedpur

Introduction

The Jugsalai Nagar Parishad has launched a comprehensive municipal solid waste management initiative covering an area of 1.29 square kilometres with a dense population, the program focuses on innovative wet waste recycling methods, integrating circular economy principles to minimise landfill dependency and optimize resource efficiency.

Activities

The initiative promotes home composting with distributed composters and biogas production through SHGs like Prerna Mahila Samiti. Fruit waste is used for bio-enzyme toilet cleaners, while tea shops compost organic waste. Community members upcycle materials into decor, and SHG artisans repurpose tree fruit seeds into toys.

Integration with Circular Economy

The initiative fosters waste minimisation, resource conservation, and upcycling, ensuring a closed-loop waste system. It transforms organic waste into compost and biofuel, reducing landfill burden while repurposing non-biodegradable materials into useful products. Replacing chemical cleaners with bio-enzyme alternatives, it prevents water pollution and encourages sustainable consumer habits. Cow dung is also repurposed for making incense sticks (Agarbattis), diyas, and herbal phenyl, demonstrating effective waste utilisation across sectors.

Replicability and Scalability

The low-cost nature of home composting and biogas production makes it accessible for urban and semi-urban areas. The model can be extended to other wards by training SHGs in upcycling and sustainable production.

Impact

- Reduces organic and inorganic waste through composting, biogas production, and upcycling.
- Prevents chemical runoff into water bodies, contributing to water conservation and pollution control.
- Encourages waste segregation and resource recovery, limiting landfill dependency.

- Women's SHGs benefit from new entrepreneurial opportunities, generating income from eco-friendly product sales.
- Strengthens community participation in sustainability efforts through educational outreach and awareness campaigns.

- Low-cost waste solutions reduce municipal waste management expenses.
- Communities save on chemical cleaners by adopting homemade bio-enzyme products.

To know more

Contact

Raiendra Kumar
City Manager -cum- Nodal Officer (SBM),
Jugsalai Nagar Parishad, Jamshedpur
jugsalaimunicipality@gmail.com

On-site Waste Composting: Jharkhand's Organic Waste Management

State/UT	Jharkhand
Urban Local Body	Mango Nagar Nigam, Jamshedpur
Department/ Organisation	SBM department, Mango Nagar Nigam, Mango

Introduction

This onsite wet waste composting initiative reduces dependency on centralized waste processing facilities and eases landfill burdens by engaging residential societies (RWAs) in composting practices at their premises, promoting sustainable waste management at the community level.

Activities

The initiative has been successfully implemented in multiple residential societies that practice onsite composting, reducing the volume of organic waste sent to landfills. The compost produced is used in gardens and green spaces, providing a natural alternative to chemical fertilizers. Regular training sessions and awareness programs educate residents on proper waste segregation, composting techniques, and system maintenance. To support this transition, the municipal body provides composting kits and technical assistance, ensuring seamless adoption and operation.

Integration with Circular Economy

This initiative fosters waste diversion, resource recovery, and environmental sustainability by transforming organic waste into compost. By replacing landfill disposal with localized composting solutions, the program reduces methane emissions, enriches soil quality, and minimizes municipal waste transportation costs. Partnerships with local authorities and community groups ensure long-term viability, while the reuse of compost in green spaces exemplifies sustainable resource management.

Replicability and Scalability

This onsite composting model can be replicated in other urban and semi-urban residential societies by adopting a structured approach that includes training, supportive infrastructure, and partnerships with local stakeholders. The scalability of this initiative is strengthened through municipal support, public-private partnerships, and digital platforms for waste tracking.

Impact

- Diverts organic waste from landfills, significantly reducing methane emissions.
- Enriches soil quality, supporting healthier plants and green spaces.
- Promotes sustainable resource management, reinforcing circular economy principles.

- Community engagement fosters environmental awareness and collective responsibility.
- Improved public health through better waste management and reduced pollution.
- Creates job opportunities in composting system setup, training, and maintenance.

- Reduces municipal expenses on waste transportation and landfill management.
- Saves residents money by replacing chemical fertilizers with compost.
- Potential revenue generation from selling compost for landscaping or agricultural use.

To know more

Contact

Dineshwar Yadav
City Manager SBM,
Mango Municipal Corporation
mangonotifiedarea@gmail.com

City Farmers Partnership Programme: Chikkaballapura Tackles Wet Waste

State/UT	Karnataka
Urban Local Body	Chikkaballapura City Municipal Council
Department/ Organisation	Chikkaballapura City Municipal Council, Godrej Properties Limited, Indian Institute of Human Settlements
Duration	Ongoing

Introduction

The City-Farmer Partnership Programme was launched in Chikkaballapura, through the combined efforts of the Chikkaballapura City Municipal Council, Godrej Properties Limited, and the Indian Institute of Human Settlements. The programme facilitates a collaboraion between Chikkaballapura's civic administration and its local farmers to convert organic urban wet waste into valuable compost to fertilise agricultural lands.

Activities

Organic wet waste from Chikkabakkapura is segregated and transported to the farmlands. The farmers have been provided the necessary training required to help them understand and implement the processes involved in converting organic waste to nutrient-rich compost. This empowers the farmers, as well as local Self-Help Groups that are involved in the programme, to implement scientific waste management and introduce sustainable farming practices, that no longer require them to depend on harmful pesticides and chemical fertilizers.

Chikkaballapura City Municipal Council has additionally established a resting and lounge centre to promote worker welfare and well-being. The workers can avail of sanitation services, washing facilities, resting rooms, and an open-dining area.

Integration with Circular Economy

The programme has been ideated and implemented with the tenets of a circular economy in mind. The segregated organic wet waste is converted into compost that is fed into the farmlands and used as natural fertilizers. This creates a circular economy through the repurposing of waste into a biodegradable output that is beneficial for overall land health and productivity.

Replicability and Scalability

This programme is replicable in other cities across the country, where Urban Local Bodies can form connections between the urban and rural sectors, and impart training to farmers and other civic sanitation workers.

Impact

- Effective waste minimization system, that additionally benefits the environment through the production of nutrient-rich compost in a waste-to-wealth model.
- Encourages community collaboration, and connects the urban and rural sectors, that have additionally benefited from trainings and capacity building sessions on waste management, source segregation, and composting.
- So far, more than 750 tonnes of waste has been supplied to more than 100 farmers across 17 Chikkaballapur villages. The compost produced through these processes is distributed at no cost to encourage the farmers to adopt sustainable agriculture practices.

To know more

Contact

Venkataravana Reddy
State Mission Director, Joint Director-SBM
Swmcelldma@gmail.com

Mo Khata': Odisha Tackles Organic Waste

Introduction

Odisha's "Mo Khata" (My Compost) programme launched by the Housing and Urban Development Department of Odisha, is a dedicated step towards enhanced and sustainable municipal solid waste management. Prior to this strategic civic intervention, unsegregated domestic and industrial waste materials were often dumped onto any available open space of land, creating informal, unmanaged and environmentally toxic dumpsites across the state. "Mo Khata" is Odisha's waste-to-wealth, community-driven success story which follows a zero landfill approach, by promoting end-to-end waste management from the point of its collection to compost.

Activities

Detailed standard operating procedures and guidelines were developed to create a sustainable framework for targeted and streamlined municipal solid waste management in the city. 260 Micro-Composting Centres (MCCs) and 220 Material Recovery Facilities (MRFs) for the processing of wet and dry waste respectively were established across urban Odisha. The compost manufactured at the MCCs by segregating and processing the organic fraction of municipal solid waste was sold as "Mo Khata" at an extremely nominal price.

Integration with Circular Economy

Odisha's "Mo Khata" is a waste-to-wealth scheme that follows the principles of circular economy by ensuring waste minimization through its diversion away from landfills and incinerators to the MCCs. This has greatly reduced the emission of harmful toxins and greenhouse gases that are detrimental to environmental health. The compost produced is an organic, toxin-free, natural fertilizer that helps to boost soil health and productivity, effectively giving back to the environment.

Replicability and Scalability

Odisha's decentralised waste-to-wealth model is simple, robust, and easy to replicate across urban India. Ensuring community cooperation and active participation, as well as involving local self-help groups can streamline and entrench these processes within the larger waste management systems already in place. This model can also be scaled across peri-urban and rural areas.

State/UT	Odisha
Urban Local Body	All (state-wide initiative)
Department/ Organisation	Housing and Urban Development Department, Odisha
Duration	Since 2020

Impact

- The creation and successful distribution of compost within the resource recovery model has greatly benefitted local ecosystems across the state of Odisha, enabling civic authorities to tackle the city's waste more efficiently and with greater public cooperation.
- The reduction of open dumping of waste has greatly improved public health and sanitation across Odisha, preventing the spread of harmful diseases such as diarrhea, cholera, and dengue, which are often precipitated by inadequate waste management.
- This initiative has further reduced the amount of waste that is being sent to landfills due to its promotion of the end-to-end processing of waste.
- By December 2024, 12,601 tonnes of "Mo Khata" had been produced. Its subsequent sale has accumulated a total revenue of INR 10.84 crores.

To know more

Contact

Sri Rajesh Prabhakar Patil, IAS
Special Secretary to Government and State Mission Director, SBM (Urban), Odisha
sanitationhud@gmail.com

Worms at Work: Assam Tackles Waste Through Vermicomposting

State/UT	Assam
Urban Local Body	Municipal Corporation Ambikapur
Department/ Organisation	Assam State Urban Livelihoods Mission under Department of Housing & Urban Affairs,
Duration	Since 2019

Introduction

The Mulagabhoru Area Level Federation (ALF) under the Assam State Urban Livelihoods Mission (ASULMS) in Sivasagar, Assam, has pioneered a transformative initiative, aimed to address multiple challenges, including waste disposal and livelihood generation for women SHG members. By turning organic waste into valuable vermicompost, the initiative not only promotes a circular economy but also creates economic opportunities for the local community.

Activities

The ALF undertook door-to-door garbage collection, segregation of waste at the source, and raised awareness on hygiene, plastic waste reduction, and composting. Their efforts in Ward No. 10 of Sivasagar Municipal Board have led to a shift in public behavior regarding waste segregation and home composting. The ALF signed an MoU with the Sivasagar Municipal Board to formalize garbage collection, covering around 1,000 households. They launched a 'Vermicompost Project' in 2019, supported by Sivasagar Municipal Board, NULM, and SBM(U), which produces 360 quintals of vermicompost annually, generating ₹ 9,00,000 in revenue.

Integration with Circular Economy

Vermicomposting is a quintessential circular economy practice as it converts organic waste into nutrient-rich fertiliser, reducing landfill waste and promoting resource efficiency. The ALF's initiative ensures organic waste recycling, reuses waste for composting, and produces a value-added product that supports sustainable agriculture. The establishment of a Material Recovery Facility (MRF) for segregation further emphasises waste minimisation and resource recovery.

Replicability and Scalability

The vermicomposting model is highly replicable in both urban and rural settings. Its scalability lies in training SHG members, establishing infrastructure, and fostering partnerships with governmental and private entities. With support for branding, marketing, and a strong policy framework, the initiative can be scaled up to larger operations.

Impact

- The project aids in waste minimisation, greenhouse gas reduction, and soil health improvement. The initiative's recognition through a nomination for the National Level 'Swachhata Excellence Award-2019-20' underscores its success.
- The project has enhanced the status of women in the community, offering them leadership roles and a steady income stream.
- SHG members earn income through the sale of vermicompost and additional products like vermicompost tea.

To know more

Contact

Juri Changmai (Secretary, Mulagabhoru ALF)
DAY-NULM, Deptt HoUA, Govt of Assam, Secretary, Mulagabhoru ALF,
DAY-NULM Sibsagar ULB
sivasagar.cmmu@gmail.com

Turning Waste into Silicone-Rich Granules: The Dewas Way

State/UT	Madhya Pradesh
Urban Local Body	Dewas Municipal Corporation
Department/ Organisation	Dewas Municipal Corporation
Duration	Since 2023

Introduction

The Wet Waste Project aims to establish a sustainable waste management system by converting organic wet waste into high-quality granulated manure. This initiative focuses on reducing landfill dependency through efficient biodegradable waste processing while enhancing soil health with eco-friendly organic fertilizer.

Activities

The formation of silicon-rich green waste granules involves a structured process of collection, treatment, enrichment, and granulation. Biodegradable waste such as plant residues, agro-waste, and husks is collected and sorted to remove non-biodegradable materials. The waste is then shredded, moisture-adjusted, and inoculated with microorganisms to accelerate decomposition through controlled aerobic composting. Silicon enrichment follows, where silica-rich materials like rice husk ash and mineral fortifiers are added. The composted material is then granulated using natural binders, pelletized, and dried. The final product undergoes quality testing before being packaged for distribution.

Integration with Circular Economy

The recycling of wet waste into granulated manure exemplifies circular economy principles by transforming organic waste into a high-value agricultural resource. Unlike regular compost, this enriched manure enhances soil health and reduces reliance on chemical fertilizers, creating a sustainable waste-to-wealth model. By closing the loop in waste management, it minimizes landfill dependency, promotes resource efficiency, and supports a greener economy.

Replicability and Scalability

The Granules (Manure) from Wet Waste Project has replicability and scalability potential, from community-based small units to large industrial-scale production. With the right technology, policy support, and market alignment, it can become a key solution for sustainable waste management and organic farming worldwide.

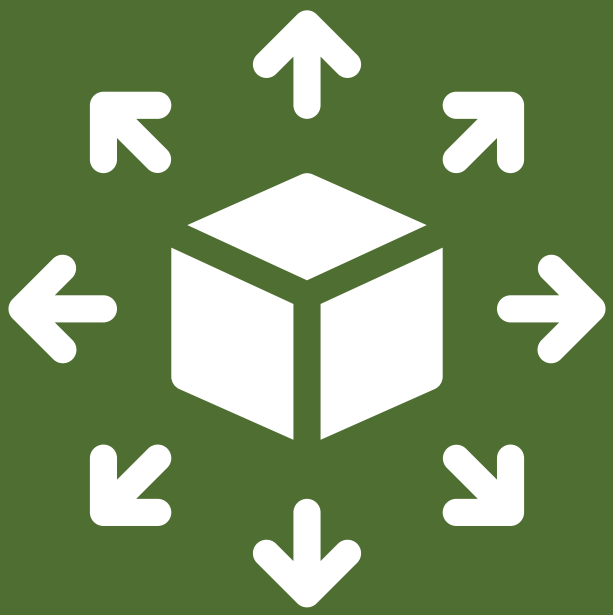
Impact

- Diverts organic waste from landfills, reducing land consumption and preventing groundwater contamination.
- Minimizes air pollution by reducing the open burning of organic waste.
- Reduced methane emissions from decomposing waste and enhances carbon sequestration through organic fertilizers.
- Improves soil fertility and microbial activity, promoting long-term soil health by strengthening crops with silica enrichment, reducing dependence on synthetic fertilizers.

To know more

Contact

Mr. Shailesh Paliwal
Director
Greencrop Biocam and fertilizer
greencropbioindore@gmail.com



DECENTRALISED WASTE MANAGEMENT

Decentralised waste management is emerging as a transformative approach in urban and rural India, empowering communities to take charge of their waste at the source and entrenching efficient and streamlined waste management. To combat the issues raised by having an insufficient number of sanitation staff, inadequate infrastructure, and imprecise segregation, decentralised systems can be put in place to improve services. Localized waste management systems, composting, and recycling initiatives led by municipalities, Self-Help Groups, and entrepreneurs are reducing landfill dependency and promoting local responsibility. With growing awareness and government initiatives such as the Swachh Bharat Mission and Mission LiFE, communities across India are actively contributing to sustainable and eco-friendly waste management practices. This holistic approach not only mitigates waste at its origin but also drives collective responsibility and behavioural change, paving the way for a cleaner, greener future.

Keeping Lucknow Clean: The Impact of Door-to-Door Waste Collection & Recycling

State/UT	Uttar Pradesh
Urban Local Body	Lucknow Municipal Corporation
Department/ Organisation	Environment Division, Lucknow Municipal Corporation
Duration	12 Months

Introduction

Municipal solid waste management is a critical challenge due to rapid urbanization and unplanned development. The Lucknow Municipal Corporation, in collaboration with Lucknow Swachchata Abhiyan (LSA), has implemented an efficient waste collection and transportation system. This initiative spans five zones, covering 77 wards, 5 lakh households, and benefiting 27 lakh citizens, ensuring proper waste disposal and reducing environmental hazards.

Activities

The initiative includes door-to-door collection of segregated waste from households, commercial establishments, and institutions. Infrastructure development includes the design and operation of Primary Collection & Transfer Stations (PCTS), Fixed Compactor Transfer Points (FCTPs), and Material Recovery Facilities (MRFs). Secondary transportation ensures separate wet and dry waste movement to processing sites. Street cleaning is conducted through manual and mechanical sweeping. Special waste collection ensures proper disposal of horticultural and domestic hazardous waste. Additionally, a user charge collection system, a public awareness campaign, and a 24/7 grievance redressal system have been established to enhance operational efficiency.

Integration with Circular Economy

Recycling initiatives improve sorting and processing, ensuring recovered materials are reintroduced into the supply chain. Composting organic waste enhances soil health, while waste-to-energy solutions reduce landfill dependency. The initiative also reduces air pollution, conserves resources, and minimizes environmental hazards associated with improper waste disposal.

Replicability and Scalability

The initiative follows a structured Management and Implementation Operational Plan (MIOP), enabling quick replication in other cities. The project's high-level structure covers waste collection, transportation, manpower deployment, technology integration, and performance tracking.

Impact

- Reduced landfill dependency, lower carbon emissions from electric and CNG-powered vehicles, and improved air and soil quality.
- Improved public health through proper waste disposal, enhanced urban aesthetics, and increased community participation in sustainable waste practices.
- Employment generation for more than 2800 individuals, economic benefits from recycling and composting, and cost efficiency for the municipal corporation.

To know more

Contact

Anupam Mishra
Project Head,
Lucknow Swachchata Abhiyan
anupam.mishra@resustainability.com

Zero Waste, Maximum Impact: Decentralized Waste Processing for a Greener Jaipur

Introduction

The Decentralized Waste Processing and Zero Waste Project aims to establish a decentralized waste processing facility at the directorate level, promoting a zero-waste status for the building. A comprehensive survey was conducted to estimate waste generation, leading to the implementation of facilities for wet waste processing and recyclable recovery.

Activities

The decentralized waste processing approach effectively alleviates the burden on the collection and transportation of municipal solid waste, resulting in savings of approximately INR 1700-1800 per ton in collection charges. This method facilitates improved source segregation, as the smaller volume of waste handled enhances overall efficiency. The finished products, such as compost, can be utilized in city gardens, while recyclables are easily mobilized to local recyclers. As a result, overall processing costs are reduced, and the load on centralized waste processing plants is minimized, promoting a more sustainable waste management system.

Integration with Circular Economy

The Project supports the circular economy by promoting effective waste segregation and resource recovery, enabling the conversion of waste into valuable products like compost. This initiative reduces landfill dependency and encourages recycling, thereby enhancing resource efficiency and sustainability within the community.

Replicability and Scalability

The Project holds a potential for replication across all government buildings in Rajasthan. The scalability of the project is evident in its various waste processing capacities, which can accommodate different levels of waste generation. For instance, facilities can be established with capacities ranging from 100 kg/day, requiring a capital expenditure (Capex) of INR 10,00,000 and yearly operational expenditure (Opex) of INR 1,80,000, to larger facilities processing 5000 kg/day, which would entail a Capex of INR 75,00,000 and Opex of INR 7,20,000. This flexibility allows for tailored implementations based on specific needs and capacities of different government buildings.

State/UT	Rajasthan
Urban Local Body	Directorate of Local Bodies Jaipur
Department/ Organisation	Directorate of Local Bodies Jaipur
Duration	Since 2020

Impact

- The initiative positively impacts the environment by reducing greenhouse gas emissions, promoting resource conservation, minimizing waste, and enhancing the recycling of materials.

To know more

Contact

Deepak Singhal
Executive Engineer,
DLB Jaipur
cedlbjp@gmail.com

Waste-free Communities: How Navi Mumbai's Transforming Slums

Introduction

Recognising the challenges of waste management in informal settlements, the Navi Mumbai Municipal Corporation (NMMC) launched the Zero Waste Slum Model. The initiative integrates circular economy principles, empowering marginalised waste workers and improving urban sanitation.

Activities

The initiative commenced in April 2019 in Indira Nagar and Adavali Gaon and later expanded to Hanuman Nagar and other slum areas. Initial challenges in waste segregation were addressed through partnerships with Stree Mukti Sangathan, an NGO promoting waste worker empowerment. The model operates through a door-to-door collection system, ensuring household waste segregation using twin-bin systems.

Dry waste is sorted and recycled through collaborations with private firms. Currently operational in five locations, the initiative is set to expand to nine. With an 80 percent waste diversion rate achieved in the first month, the initiative has significantly reduced the volume of waste sent to landfills. Rag pickers now earn stable incomes through structured waste collection and recycling activities. The stakeholders involved in the initiatives include Navi Mumbai Municipal Corporation (NMMC), Stree Mukti Sangathan, Parisar Bhagini: Self-help Groups (SHGs), Bisleri and residents of slums.

Integration with Circular Economy

The Zero Waste Slum Model transforms waste into valuable resources, reducing landfill burden. Dry waste such as plastics, paper, and metals is sorted and sold to recyclers, with corporate partnerships (e.g., Bisleri) supporting plastic repurposing. Organic waste is composted and sold for agricultural use, creating an additional revenue stream.

Replicability and Scalability

Cities can adopt similar systems by setting up decentralised composting units, forging NGO partnerships, and launching awareness campaigns.

State/UT	Maharashtra
Urban Local Body	Navi Mumbai Municipal Corporation (NMMC)
Department/ Organisation	Solid Waste Management Department
Duration	Since 2019

Impact

- It diverts 54 metric tons of waste from landfills each month, reducing pollution and greenhouse gas emissions.
- The model has created dignified employment opportunities for rag pickers and SHG members, particularly women, enhancing their livelihoods and financial independence. By ensuring clean surroundings, the initiative has also contributed to improved public health in slum communities.
- The decentralised approach has cut waste collection and transportation costs by 51 percent. The initiative has saved INR 40,23,00,000 annually across five locations, with further projected savings.

To know more

Contact

Dr. Kailas Shinde
Commissioner,
Navi Mumbai Municipal Corporation
commissioner@nmmc.gov.in

A Resource in Disguise: Nagar Nigam Gorakhpur's Circular Economy Insights

Introduction

The Nagar Nigam Gorakhpur has undertaken an initiative which aims to minimise waste, maximise resource recovery, and address environmental challenges through inclusive and innovative practices. Nagar Nigam Gorakhpur led the project, working closely with Self-Help Groups (SHGs) and informal sector workers. Startups and private partners have been engaged through Public-Private Partnership (PPP) models for technological integration and operational efficiency.

Activities

A 100 percent door-to-door waste collection and improved source segregation from 50 percent to 75 percent has been established. Five MRFs (190 TPD) and a 50 TPD construction and demolition (C&D) waste plant handle dry waste, while organic waste is processed through pit composting (155 TPD) and vermicomposting (30 TPD). An animal crematorium ensures safe disposal, with future plans for a 300 TPD bio-methanation plant and a 500 TPD waste-to-charcoal plant. IEC campaigns promote plastic waste reduction and sustainability. Three STPs (60 MLD) treat wastewater for reuse in irrigation, landscaping, and non-potable applications, reducing discharge. At Moti Pokhara Lake, nanobubble, ultrasound technologies, and Nature-Based Solutions aid water restoration.

Integration with Circular Economy

Dry waste and C&D waste are being recycled and repurposed for secondary applications such as road construction. Organic waste is processed through composting, creating valuable byproducts. Innovative upcycling practices have been introduced, including the production of jewellery from wild grass and crockery from coconut shells, adding economic value to waste materials. Additionally, treated liquid waste is being reused in irrigation, landscaping, and industrial applications.

Replicability and Scalability

This initiative presents a structured and adaptable model that can be replicated in other municipal corporations. The involvement of various stakeholders, strong community engagement, and financial viability make it a sustainable and practical approach for other urban areas.

State/UT	Uttar Pradesh
Urban Local Body	Nagar Nigam Gorakhpur
Department/ Organisation	Directorate of Urban Local Bodies, Uttar Pradesh
Duration	Since 2024

Impact

- Efficient water reuse reduces reliance on freshwater sources.
- Diverted significant amounts of solid and liquid waste from landfills and natural water bodies.
- Lowered greenhouse gas emissions through advanced waste processing and legacy waste remediation.
- Strengthened livelihoods by integrating SHGs and informal workers into the waste management system.
- Improved market linkages for waste byproducts enhanced economic viability.

To know more

Contact

Gaurav Singh Sogarwal (IAS)
Municipal Commissioner,
Nagar Nigam Gorakhpur
nagarnigamgorakhpur@gmail.com

Door-to-Door Initiative: Riding Towards Pushkar's Cleanliness

State/UT	Rajasthan
Urban Local Body	Nagar Parishad Pushkar
Department/ Organisation	Nagar Parishad Pushkar
Duration	Since 2024

Introduction

The Nagar Parishad Pushkar has implemented the Door-to-Door (D2D) Collection initiative to improve waste management in the area. This approach focuses on achieving 100 percent garbage collection to ensure a cleaner and more sustainable environment. A key stakeholders in this initiative is Udaan India Foundation.

Activities

The Nagar Parishad Pushkar has introduced a motorcycle rickshaw specifically designed for garbage collection in small and narrow streets, significantly enhancing accessibility for waste management in hard-to-reach areas. This motorcycle is equipped with two separate boxes to collect wet and dry waste.

Integration with Circular Economy

The D2D Collection facilitates effective waste segregation and collection at the source and promotes environmentally friendly disposal practices.

Replicability and Scalability

The D2D Collection initiative is a practice that demonstrates effective waste management strategies, making it suitable for replication in other urban high density areas with narrow streets.

Impact

- The initiative positively impacts the lives of the Rickshaw Drivers, providing them with an opportunity to improve their livelihood.

To know more

Contact

Lokendra Singh
Sanitary Inspector,
Nagar Parishad Pushkar
np.pushkar.nagarpalika@gmail.com

PLASTIC WASTE MANAGEMENT

A persistent global problem, plastic waste and, subsequently, plastic pollution have infiltrated our environment, altering ecosystems, invading natural habitats, disrupting the food supply chain, and harming human and animal health. Often dumped along roadsides or into waterbodies such as ponds, lakes, rivers, and oceans, the menace of single-use plastics (SUPs) like plastic cups, straws, plates, and packets has greatly exacerbated this crisis. While plastic is an environmental problem, it is also deeply ingrained into our society every day through direct or indirect use. Providing renewable alternatives while also raising public awareness and accessibility to the same remains a crucial part of the redressal process. India has been hard at work to tackle this pervasive challenge by finding sustainable and biodegradable alternatives to SUPs. States are on track to create environmentally conscious, responsible, and responsive consumers that endeavour to switch from SUPs to renewable alternatives like cloth bags. Pockets of SUP-free zones have successfully been created all over the country, within educational institutions, markets, green zones, and so on.

Eco-Friendly Festival Celebrations: Andaman & Nicobar's Plastic And Waste Reduction Method

Introduction

The initiative aims to promote sustainable practices during Puja Festival celebrations by minimising waste generation and encouraging the use of eco-friendly materials. A key focus is reducing single-use plastics and raising public awareness about environmental protection during cultural events, ensuring that traditions and sustainability go hand in hand.

Activities

Festival events were organised with sustainable décor and eco-friendly materials, replacing conventional non-biodegradable decorations. Standard Operating Procedure (SOP) or guidelines for waste minimisation and segregation were implemented, ensuring responsible waste disposal throughout the festival.

Public awareness campaigns and educational initiatives were conducted to inform attendees about the benefits of reducing plastic use and managing waste effectively. Strong collaborations with local vendors, community groups, and environmental organisations played a crucial role in managing festival waste efficiently and promoting sustainable practices.

Integration with Circular Economy

The initiative integrates the principles of the circular economy by ensuring the reuse or recycling of festival materials, and converting leftover waste into compost and other value-added products.

Replicability and Scalability

This initiative can be adapted for other festivals and cultural events across the country at various scales, making sustainability a key consideration in large public gatherings. With increased participation from vendors, community groups, and local authorities, the initiative can be further expanded by integrating it with broader municipal waste management programs, ensuring long-term impact and scalability.

State/UT	Andaman & Nicobar Islands
Urban Local Body	Sri Vijaya Puram Municipal Council (SVPMC)
Department/ Organisation	Sri Vijaya Puram Municipal Council (Formerly Port Blair Municipal Council)
Duration	Ongoing

Impact

- The initiative contributed to a cleaner and more sustainable environment by reducing overall waste generation during the festival.
- The improved waste management strategies led to better environmental quality, while enhanced recycling efforts and helped divert waste from landfills.
- It also fostered greater community engagement, encouraging individuals to adopt eco-friendly practices in their daily lives.

To know more

Contact

P Umamaheswara Rao
Junior Engineer,
Sri Vijaya Puram Municipal Council,
uma.rao1679@gmail.com

Andaman & Nicobar's Plastic Waste Reduction: A Milk Pouch Buy-Back Scheme

State/UT	Andaman & Nicobar Islands
Urban Local Body	Sri Vijaya Puram Municipal Council (SVPMC)
Department/ Organisation	Sri Vijaya Puram Municipal Council (Formerly Port Blair Municipal Council)
Duration	Ongoing

Introduction

To address the growing plastic waste problem, an initiative was launched to encourage the return of used plastic milk pouches. The initiative encouraged waste disposal and recycling through a buy-back mechanism, offering consumers incentives to return used pouches. By transforming waste into a valuable resource, the initiative sought to create a sustainable model for plastic waste management.

Activities

In collaboration with the Andaman and Nicobar Islands Integrated Development Corporation Organisation (ANIIDCO), and the South Andaman District's SVPMC a system was introduced where used ANIIDCO milk pouches could be returned for incentives. Designated collection points were established, making it easier for consumers to participate.

In return consumers were offered rewards such as fresh milk or discounts on future purchases. Public awareness campaigns were launched to educate residents about the environmental benefits of recycling and responsible waste disposal, reinforcing a culture of sustainability.

Integration with Circular Economy

The scheme transformed waste into a valuable resource by reintegrating used plastic milk pouches into the manufacturing cycle, thereby ensuring circularity. This approach reduced the demand for virgin plastic, minimised environmental pollution, and demonstrated the economic benefits of recycling.

Replicability and Scalability

This model has potential for replication in other regions facing similar waste management challenges. It can also be adapted to include different types of plastic waste, such as food packaging or beverage containers. It can be scaled at different levels through additional collection points, integrating digital tracking systems for better monitoring, and partnering with more recycling facilities to maximise its environmental and economic impact.

Impact

- The initiative significantly reduced plastic waste, easing the burden on landfills and mitigating environmental hazards.
- Additionally, community participation was strengthened, fostering long-term environmental consciousness and encouraging sustainable practices at the grassroots level.
- By creating a structured buy-back system, it generated revenue from the sale of recycled materials while offering economic incentives for responsible waste management.

To know more

Contact

P Umamaheswara Rao,
Junior Engineer,
Sri Vijaya Puram Municipal Council
uma.rao1679@gmail.com

Effective Plastic Waste Management: Baramulla's Story

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Council Baramulla
Department/ Organisation	Municipal Council Baramulla
Duration	Ongoing

Introduction

Facing challenges in managing plastic waste such as polythene bags often littered across the city, clogging drains and polluting River Jhelum, the Municipal Council Baramulla decided that it was high time to stage an important intervention. The improper disposal of plastic waste has contributed to environmental pollution, making effective waste management solutions crucial for the town. In collaboration with Yuva Chinar (a youth-based organization), therefore, Baramulla kickstarted the launch of sustainable circular solutions to tackle plastic waste.

Activities

Intending to create a circular economy by recycling plastic waste into useful products, thereby reducing environmental pollution and promoting sustainable practices, the initiative saw the community, especially the youth, come together to actively partake and do their bit in helping their neighbourhoods.

Plastic was directly collected from households and shops. The Municipal Council Baramulla and Yuva Chinar worked together to encourage residents and shopkeepers to hand over their plastic waste, particularly polythene bags. The collected plastic was handed over to the Yuva Chinar processing unit, where it was recycled and repurposed into various products such as carry bags, laptop bags, file covers, and bottle covers. Over six months, approximately 568 kg of plastic waste was successfully collected and processed in the aforementioned unit.

Integration with Circular Economy

The Municipal Council Baramulla and Yuva Chinar have successfully implemented circular economy principles within their plastic waste management apparatus by ensuring that the waste collected is recycled and repurposed to give it a longer shelf-life.

Replicability and Scalability

A simple yet strategic and highly impactful initiative, effective plastic waste management with a focus on recycling and revenue generation can be launched across cities in India. Within Baramulla, to scale this initiative, other industries and bulk waste-generating units could be included in the scheme and encouraged to donate their plastic waste for further processing and recycling.

Impact

- Minimizing the amount of plastic waste sent to landfills and incinerators.
- Preventing the accumulation of plastic in drains, roads, sewers, and waterbodies, effectively reducing land and water pollution.
- Increased community awareness and participation in waste segregation, collection and recycling.
- Revenue generation through the sale of recycled goods.

To know more

Contact

Naveed Ajaz Khan
CEO,
Municipal Council Baramulla
navidaijaz@gmail.com
eomcbaramulla@gmail.com

Closing the Loop: Implementing Circular Economy Best Practices in Aibawk

Introduction

The Aibawk Plastic Waste Management Unit, implemented under Swachh Bharat Mission (Grameen), is a pioneering initiative aimed at tackling plastic waste in rural areas. Covering 20 villages, the project focuses on the collection, segregation, and safe disposal of plastic waste, ensuring environmental sustainability and public health protection. Operated under a Public-Private Partnership (PPP) model with Waste Tech & Bio-energy, the initiative integrates circular economy principles to maximize recycling and minimize waste.

Activities

The unit is equipped with shredding, baling, and conveyor belt machines to efficiently process plastic waste. Waste collection is conducted weekly, with designated vehicles picking up plastic from each household. Households contribute INR 50 as sanitation fee to support operations. The unit employs nine staff members, including a manager, drivers and waste collectors. The collected recyclable plastics are segregated and sold to scrap dealers, generating revenue for the unit.

Integration with Circular Economy

The initiative incorporates circular economy practices by recycling, reusing, and refurbishing plastic waste. Collected plastics are processed and sold at varying rates, with PET bottles at INR 10/kg, HDPE bottles at INR 25/kg, and metal cans at INR 20/kg. The unit produces 15-20 bales per day and sells 50-55 bales per trip, generating monthly revenue of INR 10,000 - 15,000. This model promotes waste-to-value strategies and creates a self-sustaining waste management system that reduces environmental pollution.

Replicability and Scalability

The Aibawk model is replicable, particularly in rural areas where plastic waste management is a challenge. With PPP model, policy support and greater community participation, this cost-effective and revenue-generating model can be adapted in other regions to promote sustainable waste management.

State/UT	Mizoram
Urban Local Body	Aibawk
Department/ Organisation	Public Health Engineering Dept, Govt of Mizoram
Duration	Since 2023

Impact

- Reduces plastic waste in rural areas, prevents littering, and ensures safe disposal and recycling, mitigating environmental hazards.
- The project creates employment for local workers, enhancing community participation in waste management.
- Monthly expenses amount to INR 1,96,500, with a net profit of INR 26,850 from plastic bale sales.

To know more

Contact

H. Lalbiakhlua
Public Health Engineering Department
sbmg.mizoram@gmail.com
mabiakahmar@gmail.com

Plastic Waste Management in Char Dham: A Digital Deposit Refund System

State/UT	Uttarakhand
Urban Local Body	Nagar Panchayat Kedarnath
Department/ Organisation	Urban Development Department, in collaboration with Recykal & District Administrations
Duration	Since May 2022

Introduction

The Digital Deposit Refund System (dDRS) was introduced in Kedarnath in May 2022 to address plastic waste pollution in the Char Dham region. The initiative aims to encourage responsible waste disposal through financial incentives, promoting behavioral change among pilgrims. Using a QR-based deposit refund mechanism, plastic bottles and multi-layered plastics (MLPs) are collected and recycled, ensuring better waste management and environmental conservation. Key stakeholders involved are Government authorities at district, Recykal, Retailers and HoReCa Establishments (hotels, restaurants, local shops); pilgrims and tourists; collection agencies; and local mule transporters (pithuwalas).

Activities

The initiative involves shop registration and QR code distribution to track plastic packaging. A refundable INR 10 deposit is applied to plastic bottles and MLPs, encouraging consumers to return used packaging at designated collection points or Reverse Vending Machines (RVMs). Waste is systematically collected and transported to Material Recovery Facilities (MRFs), and recycled. Awareness campaigns, stakeholder consultations, and legal interventions have strengthened implementation.

Integration with Circular Economy

The initiative applies circular economy principles by recycling plastic waste, engaging retailers in packaging collection, and maximizing resource recovery.

Replicability and Scalability

The initiative has been expanded to Gangotri, Yamunotri, and Badrinath. Further scalability is possible through integration with Extended Producer Responsibility (EPR) programs, leveraging QR-based tracking and AI-powered IoT for seamless adaptation in various geographic regions. The model can be replicated in other pilgrimage sites, eco-sensitive zones, and high-tourism urban areas.

Impact

- 20,00,000 plastic bottles are collected and recycled across the Char Dham.
- 66 metric tons of CO_2 emissions were prevented.

- Enhanced stakeholder engagement in waste management.
- 21 percent increase in proper waste disposal practices.
- 300 percent rise in plastic bottle collection in Kedarnath.

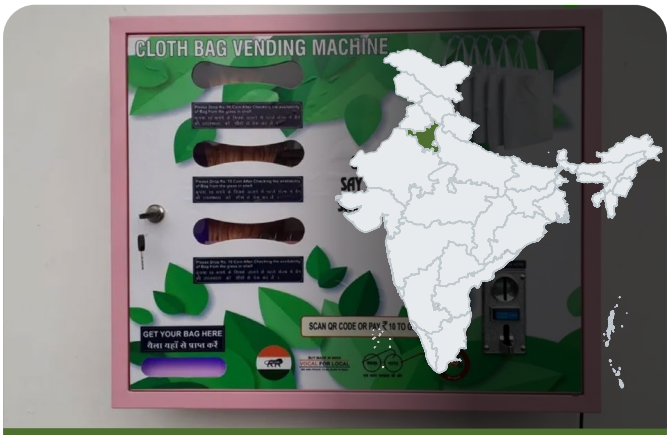
- More than 110 jobs were created for local waste workers and collectors.
- INR 3,14,000 revenue increase for retailers.
- 37.5 percent rise in earnings for the informal waste sector.
- Government savings of INR 3,73,00,000 in waste collection costs.

To know more

Contact

Vinod Kumar
Assistant Director,
Urban Development Department
directorudd@gmail.com

Haryana's Vending Machines: Combatting Plastic Waste



State/UT	Haryana
Urban Local Body	Municipal Corporation of Panchkula
Department/ Organisation	Municipal Corporation of Panchkula
Duration	1 year

Introduction

Non-biodegradable single-use plastics (SUPs) such as polythene bags have become a public menace, clogging pipes and drains, contaminating roadsides and waterbodies. Their production and eventual disposal are both greenhouse gas emitting procedures. Further, microplastics that are discarded in rivers and oceans may be ingested by marine animals and make their way into the food chain, harming human health. To tackle the proliferating problem of SUPs, the Municipal Corporation of Panchkula in Haryana has been promoting the use of SUP alternatives, such as biodegradable bags by making them increasingly accessible to obtain by the general public.

Activities

The Municipal Corporation of Panchkula has set up vending machines in key bulk-waste generating marketplaces from where customers can avail their very own biodegradable bags at a nominal price. The municipal corporation has also been actively encouraging market traders and shopkeepers to cease using SUP packages and bags, vying to create SUP-free pockets within the city limits. Biodegradable alternatives, such as cloth bags, have been promoted extensively in the hopes to extend the use of environmentally friendly bags, wrapping, and containers, especially within the retail sector.

Integration with Circular Economy

The use of biodegradable containers, bags, or wrapping that have more than a single use feeds into the basic principles of circularity.

Replicability and Scalability

While the Municipal Corporation of Panchkula has plans to scale this initiative within the city by targeting tourist spots and big retail stores, other cities may also benefit from this self-sufficient waste management module. Vending machines can be set up in malls, marketplaces, industrial areas, places of business, within public transport stations, educational institutions, and so on. This will help the project create awareness about SUPs, why they are harmful to the environment, and what alternatives to the same are available to the general public.

Impact

- Minimizes the amount of waste created through the continuous use of SUPs.
- Minimizes the amount of plastic waste sent to landfills.
- Encourages social responsibility and awareness about the benefits of making sustainable and environmentally conscious decisions within everyday life.

To know more

Contact

Sachin Dhiman
Junior Engineer,
Municipal Corporation Panchkula,
mcpanchkula@gmail.com

Bagging a Greener Future: Kamalpur's Eco-Friendly Alternative to Plastic

State/UT	Tripura
Urban Local Body	Kamalpur Nagar Panchayat
Department/ Organisation	Kamalpur Nagar Panchayat

Introduction

Kamalpur Nagar Panchayat has taken a significant step towards environmental sustainability by adopting compostable bags made from eco-friendly materials. These bags serve as a sustainable alternative to conventional single-use plastics, aiming to reduce plastic pollution while promoting biodegradable solutions. The Panchayat ensures the quality and environmental sustainability of these compostable bags through rigorous testing and certification by CIPET, meeting essential compostability and biodegradability standards. The bags are competitively priced at INR 145 per kilogram for wholesale and INR 160 per kilogram for retail, making them accessible while promoting sustainable waste management practices.

Activities

The Panchayat has introduced compostable bags made from PBAT (Polybutylene Adipate Terephthalate), a biodegradable polymer derived from renewable resources, which is flexible and durable. The production process employs a chemical-free manufacturing approach, ensuring that the bags are environmentally safe. To achieve high quality and durability, advanced machinery, including extruders and sealing machines, is utilized in the manufacturing process. Additionally, the initiative actively engages with local communities to promote the adoption of compostable bags and raise awareness about the importance of reducing plastic waste, fostering a collective effort towards environmental sustainability.

Integration with Circular Economy

The initiative promotes waste management efficiency by providing biodegradable solutions that reduce reliance on single-use plastics and enhance soil health through the return of organic material.

Replicability and Scalability

The initiative can be replicated in other urban areas. By scaling up the production capacity of compostable bags in response to growing demand, this initiative allows for wider distribution and a significant increase in its impact on reducing plastic usage.

Impact

- Compostable bags decompose naturally within 180 days under composting conditions. This is significantly fasterfaster than conventional plastics, which can take hundreds of years to break down.
- The decomposition process does not release harmful chemicals, in contrast to plastics, which can emit toxic substances into the environment.
- PBAT material is highly compatible with soil, returning valuable organic material to the earth once decomposed.
- By replacing plastic bags, these compostable alternatives help reduce waste in landfills, contributing to responsible waste management.
- The product minimizes the space required for landfills and waste disposal, fostering a cleaner and more sustainable urban environment.

To know more

Contact

G Sharath Nayak, IAS
Executive Officer,
Kamalpur Nagar Panchayat
kamalpur.np@gmail.com

Turning Plastic Waste into Public Assets: Itarsi's Circular Economy Model

Introduction

The Plastic Waste Recycling Plant in Itarsi is a pioneering initiative aimed at managing the city's plastic waste while generating economic and environmental benefits. The plant converts plastic waste into usable items such as chairs, benches, and paver blocks, reducing landfill burden and promoting sustainable urban development.

Activities

Plastic waste is collected through the Material Recovery Facility (MRF) Center with active public participation and waste segregation. It is then sorted into categories like PET, HDPE, and LDPE before undergoing shredding, melting, and moulding into products such as benches, chairs, and paver blocks. These recycled plastic items are installed in public spaces like parks and temples. Awareness campaigns engage citizens in environmental education and waste segregation, while ongoing operations focus on scaling up by increasing MRF capacity, acquiring more machines, and fostering private-sector partnerships. The project enhances environmental sustainability by reducing plastic pollution through efficient waste collection, segregation, and processing. The project is managed and coordinated by Nagar Palika Itarsi, with Balaji Enterprises responsible for manufacturing recycled plastic products. Citizens play a crucial role in waste segregation and disposal, while environmental organizations, NGOs, social organizations, and educational institutions support awareness campaigns. Safai Mitras and recycling experts handle technical aspects of waste processing and production.

Integration with Circular Economy

The initiative promotes recycling and reuse by converting plastic waste into durable products instead of allowing it to pollute the environment. It adds value by producing benches, tables, and paver blocks from recycled plastic, reducing landfill accumulation and promoting sustainable resource management.

Replicability and Scalability

The model is highly replicable for cities facing plastic waste management challenges. Urban local bodies can implement it in parks and public spaces to reduce costs. Expanding processing capacity through advanced recycling technology and partnering with private companies, NGOs, and educational institutions can help scale operations.

State/UT	Madhya Pradesh
Urban Local Body	Nagar Palika Itarsi
Department/ Organisation	Directorate of Urban Administration and Development, Madhya Pradesh
Duration	Operational since 2022

Impact

- Reduces dependence on raw materials like cement and iron.
- Lowers landfill waste and pollution levels.
- Cuts carbon footprint by reducing energy use in plastic production.
- A recycled plastic bench costs INR 4,500 compared to INR 8,000 for a cement bench, saving INR 3,04,000 across 38 benches.

- Creates employment for local manufacturers and MRF staff.
- Engages citizens, enhances public spaces, and improves urban aesthetics.

To know more

Contact

Ritu Mehra
Chief Municipal Officer,
Nagar Palika Itarsi
cmoitarsi@mpurban.gov.in

Eliminating Single-Use Plastic: Chhattisgarh's 3 Innovative Approaches

State/UT	Chhattisgarh
Urban Local Body	Municipal Corporation Ambikapur
Department/ Organisation	Municipal Corporation Ambikapur
Duration	Since 2017

Introduction

Recognising the need for sustainable solutions for growing environmental concerns related to plastic pollution, the Municipal Corporation of Ambikapur launched several initiatives to eliminate single-use plastic and ensure the scientific disposal of plastic waste. The innovative approaches, such as the Bartan Bank and Jhola Bank, were introduced to provide eco-friendly alternatives, while initiatives like the Garbage Café encouraged community participation in waste reduction.

Activities

One of the primary initiatives, the Bartan Bank, was introduced in 2017 to provide citizens with a viable and cost-effective alternative to disposable utensils. The initiative enables residents to rent steel utensils, under the 'ask-use-wash-return' model, at a minimal cost for community gatherings, marriages, and other social functions. Currently, eight Bartan Banks empower 89 Self Help Group (SHG) women and ensure citywide accessibility.

The Jhola Bank, also introduced in 2017, promotes reusable cloth and jute bags, easily available for purchase or lending, to reduce the dependency on plastic bags. With 25 operational Jhola banks, 35 SHG women are engaged in supporting sustainable alternatives.

In July 2019, the Garbage Café was launched to tackle plastic waste and food security. It offers meals in exchange for plastic waste (breakfast for 500g and a full meal for 1kg) to the underprivileged. The initiative currently engages 10 SHG members in its operations.

Integration with Circular Economy

The Bartan Bank minimises disposable waste by promoting reusable utensils, while the Jhola Bank provides long-lasting bag options that reduce plastic consumption. The Garbage Café ensures community engagement offering social benefits to waste collection.

Replicability and Scalability

The success of these initiatives makes them highly replicable across other cities facing similar challenges with plastic waste.

Impact

The Bartan Banks have generated a total revenue of INR 16,78,550 since their inception, significantly reducing the consumption of single-use plastic utensils. The Jhola Banks have sold thousands of cloth and jute bags, amounting to a revenue of INR 3,50,000. The Garbage Café has collected and repurposed 19,530 kg of plastic waste while serving approximately 24,000 meals. Additionally, the initiative has generated a revenue of INR 2,35,000 by selling collected plastic waste to cement factories and other vendors.

To know more

Contact

Mr Ritesh Saini
Nodal Officer,
Municipal Corporation Ambikapur
nagarnigamambikapur@gmail.com

Tackling Multi-Layer Plastics: Punjab's Plastic to Chipboard Scheme

Introduction

The Plastic Recycling Facility (PRF) in Patiala was established under a Corporate Social Responsibility (CSR) initiative to address the challenge of low-value plastic waste management. This facility specialises in recycling multi-layered plastic (MLP), by converting it into chipboards. These chipboards offer an environmentally friendly alternative to plywood, for furniture, roofing sheets, temporary shelters, and damp-proof walls.

Activities

The recycling process at the PRF involves multiple stages to breakdown plastic waste into chipboards. The first step involves sorting and cleaning low-value plastic waste, which is then shredded into flakes of approximately 10 mm in size. These plastic flakes are distributed evenly on an 8 ft by 4 ft platform and is then further processed to bond the flakes together, forming a single, cohesive sheet The final product is a durable chipboard that is resistant to water, termites, and rust, making it an ideal substitute for plywood in various construction and furnishing applications. The facility operates with a processing capacity of 10 tonnes of waste per day, producing approximately 75 to 100 chipboards daily. These boards are then distributed for use in infrastructure projects, furniture manufacturing, and other industrial applications. Stakeholders from Municipal Corporation, Patiala; Indian Pollution Control Association (IPCA), MLP waste collectors, other Municipal Councils and Corporations who are segregating and providing MLP Waste are involved in this process.

Integration with Circular Economy

Instead of being disposed of in landfills or incinerated, MLP waste is transformed into long-lasting, functional products. The process extends the life cycle of plastic materials, reducing environmental pollution and promoting resource efficiency.

Replicability and Scalability

This model can be replicated in other districts with municipal partnerships and CSR funding, infrastructure, and market linkages for chipboard distribution.

State/UT	Punjab
Urban Local Body	Municipal Corporation Patiala
Department/ Organisation	Indian Pollution Control Association
Duration	Since 2024

Impact

- Reduces dependency on virgin resources, thereby conserving natural materials and minimising deforestation caused by plywood production. The recycling facility significantly lowers landfill waste, preventing plastic pollution and reducing greenhouse gas emissions associated with traditional waste disposal methods.
- The initiative has led to considerable cost savings by eliminating the need for expensive waste disposal logistics. The production of chipboards from waste plastic also creates a new revenue stream, contributing to the economic viability of the project.

To know more

Contact

Dr. Reena Chadha
General Manager,
Indian Pollution Control Association (IPCA),
reena@ipcaworld.co.in

SUP-free Farmers Markets: Trichy's IEC Efforts Thrive

Introduction

Despite the ban on Single-Use Plastic (SUP) products in Tiruchirappalli, markets remain hotspots for their use and disposal. This is because SUP products are cheap and easily available. Therefore, in 2022, the Trichy City Corporation in collaboration with GIZ India's Circular Waste Solutions project implemented an important and well-timed intervention to raise public awareness and initiate change to cement Trichy's commitment towards environmental welfare.

Activities

Uzhavar Santhais or farmers markets in in Tennur, K.K. Nagar and a daily market at Woraiyur were identified and selected by the Tiruchirappalli City Corporation in partnership with GIZ and other non-profit organisations wherein the campaign for entrenching 'SUP-free markets' was launched. The markets collectively host a total of 220 vendors. The project was framed to reach out to each vendor to constructively interact and engage with them to build their awareness and understanding about SUPs - why they are harmful and what role they play in environmental degradation. Information about readily available sustainable alternatives was also provided to the vendors. Thunippai Thiruvizhai was a focused initiative that was implemented by the project to promote the use of reusable cloth bags amongst buyers.

Integration with Circular Economy

The 'SUP-free market' campaign has promoted a circular economy by reducing waste, promoting reusable alternatives, and upcycling old textiles into cloth bags. It fosters sustainable consumption, engages stakeholders, and ensures compliance with the state sanctioned SUP ban, creating a waste-free, resource-efficient market system.

Replicability and Scalability

The initiative can be replicated in many farmer's markets across India with the support of Urban Local Bodies, markets under the jurisdiction of the agricultural department, and local NGOs.

State/UT	Tamil Nadu
Urban Local Body	Trichy City Corporation
Department/ Organisation	GIZ India and Saahas
Duration	2022-2024

Impact

- The farmer's market of Tennur successfully avoided using 2,200 kgs of SUPs over a period of one year; the one in KK Nagar avoided about 620 kgs in four months; and the daily market at Woraiyur avoided about 300 kgs of SUPs over a period of six months.
- The campaign stressed on having the vendors on board, mentored them, and publicised their achievements with regards to the replacement of SUPs with sustainable alternatives.

To know more

Contact

Dr. M. Vijay Chandran
City Health Officer,
Tiruchirappalli City Corporation
commr.trichy@tn.gov.in

Vanishree B. R.
Advisor,
GIZ
vanishree.br@giz.de

WASTE-TO-ENERGY & BIOFUELS

Waste-to-energy is an integral part of India's Swachh Bharat Mission (SBM), or the Clean India Mission, which focuses on generating energy from waste and enhancing waste management across the country. This approach not only addresses the increasing challenge of waste disposal but also generates renewable energy by converting waste into usable energy forms. Approaches such as incineration, anaerobic digestion and the production of biofuels help minimise landfill usage, lower greenhouse gas emissions, and generate valuable resources like heat, electricity, and biofuel, which is an eco-friendly alternative to fossil fuel, supporting SBM's goals for a clean and sustainable environment.

Guntur's Power Play: Transforming Waste Into Clean Energy

Introduction

In the heart of Andhra Pradesh, Guntur took a bold step towards sustainable urban management by turning waste into wealth. The city, grappling with mounting municipal solid waste, launched a Waste-to-Energy (WTE) initiative in 2022, setting a precedent towards clean energy solutions while drastically reducing landfill dependency. The Guntur Municipal Corporation (GMC) collaborated with private waste management companies and the Andhra Pradesh Power Generation Corporation (APGENCO) in this endeavour.

Activities

The 15 MW Waste-to-Energy plant near Guntur processes 1,200 metric tonnes of waste daily, sourced from Vijayawada, Guntur, and neighbouring regions. By converting non-recyclable waste into Refuse-Derived Fuel (RDF), the project successfully generates energy while tackling the persistent issue of urban solid waste disposal.

Integration with Circular Economy

This initiative exemplifies circular economy principles by ensuring that even non-recyclable waste has a purpose. The residual ash from the plant finds new life in construction material, creating a closed-loop system that minimises environmental impact.

Replicability and Scalability

With the success of Guntur's WTE model, Visakhapatnam has also established a similar plant. The Andhra Pradesh government has recognised its potential, proposing three more plants, with tenders already invited for facilities in Nellore and Rajamahendravaram.

State/UT	Andhra Pradesh
Urban Local Body	Guntur Municipal Corporation (GMC)
Duration	Operational since 2022

Impact

- Landfill usage has been slashed by 70 percent, significantly reducing the associated pollution.
- Enhanced waste management infrastructure has improved living conditions in the region.
- The clean energy generated now powers 30,000 households, reinforcing Andhra Pradesh's renewable energy ambitions.

To know more

Contact

Dr. Dasaradharamreddy
Chief Operating Officer,
Guntur Municipal Corporation (GMC)
commissioner@gunturcorporation.org

Tirupati's Green Revolution: Turning Organic Waste Into Bio-CNG

State/UT	Andhra Pradesh
Urban Local Body	Tirupati Municipal Corporation
Duration	Operational since 2023

Introduction

Tirupati, known for its religious significance, is now setting an example in sustainability by transforming organic waste into Bio-CNG. Since 2023, the city's Bio-CNG plant has been tackling greenhouse gas emissions while producing clean energy and nutrient-rich compost. This initiative has been possible through the collaborative efforts of Tirupati Municipal Corporation, private waste-to-energy technology providers, local farmers and commercial CNG users.

Activities

Organic waste is collected from households, markets, and bulk waste generators. Through anaerobic digestion, biogas is produced and purified into compressed natural gas (CNG). The by-product, organic compost, is supplied to farmers, creating a sustainable cycle.

Integration with Circular Economy

The initiative converts organic waste into valuable resources—Bio-CNG for commercial use and organic compost for agriculture—ensuring that waste is treated and reused rather than discarded.

Replicability and Scalability

Highly replicable in cities with significant organic waste generation. With structured organic waste collection systems, similar plants can be set up across municipalities.

Impact

- Prevents methane emissions from organic waste decomposition, cutting down 15,000 tonnes of CO_2 equivalent annually.
- Provides farmers with affordable, high-quality compost, improving soil health.
- The sale of Bio-CNG and compost generates additional revenue for Tirupati Municipal Corporation.

To know more

Contact

Dr. Dasaradharam Reddy,
Chief Operating Officer,
Tirupati Municipal Corporation
commissioner.mct@cdma.gov.in

Karnataka's Waste-To-Energy Approach: A Biomethanation Plant

State/UT	Karnataka
Urban Local Body	Ramanagara City Municipal Council
Department/ Organisation	Ramanagara City Municipal Council
Duration	Ongoing

Introduction

The Ramanagara City Municipal Council in Karnataka has set up a local biomethanation facility that converts segregated wet waste into biogas. As a renewable source of energy, biogas production in Ramanagara is extremely beneficial to decrease the city's dependence on fossil fuels, while also tackling municipal solid waste in a sustainable manner.

Activities

Segregated wet waste is collected and fed into the biomethanation plant. This waste is broken down by anaerobic digestion, that is a process where microorganisms break down the organic matter present in the waste in the absence of oxygen. The biogas ultimately produced is rich in methane and can be used as an alternative source of renewable fuel and electricity. Through biomethanation at the Ramanagara plant, 1 tonne of wet waste can be converted to 10kW of power. The electricity generated at the plant is currently being used to power the network of street lights that surround the local premises along the facility.

Integration with Circular Economy

The transformation of organic waste material into clean and renewable sources of energy enables the establishment of a circular loop where waste is reused to produce alternative green energy.

Replicability and Scalability

The replicability and scalability of this plant depends upon land and monetary availability. However, it is an extremely beneficial waste management model that can be set up near city waste accumulation hotspots, or bulk waste generating units.

Impact

- Reduces local dependency on non-renewable sources of energy, facilitating their conservation.
- Produces biogas as a renewable source of energy, as an environmentally-friendly alternative.
- Minimizes waste accumulating in landfills and waste incineration facilities.
- Reduces greenhouse gas emissions considerably, thereby helping to mitigate the perils of air pollution in the city.

To know more

Contact

Dr. Jayanna
Municipal Commissioner,
Ramanagara City Municipal Council
ka.ramanagara.cmc@gmail.com

Producing Energy from Waste: Karnataka's GOBARdhan Initiative

State/UT	Karnataka
Gram Panchayat	Kannur
Department/ Organisation	Department of Drinking Water & Sanitation

Introduction

The Government Veterinary Polytechnic - Goshala has implemented a 45-cubic-meter biogas plant as part of the GOBARdhan initiative to manage organic waste and promote sustainable energy. This plant converts waste into 12 kilograms of biogas daily, along with producing organic manure, which improves sanitation and reduces energy costs. The biogas is used for cooking.

Activities

The project was conceptualized under the SBM-G, wherein biogas plant were installed in rural areas. With support from the Rural Drinking Water and Sanitation Department and the Zilla Panchayat, Haveri, the Government Veterinary Polytechnic - Goshala was identified as a suitable location for the plant. The staff at the veterinary hospital and Goshala received training in operating and maintaining the biogas plant to ensure its long-term sustainability.

The primary waste sources include the generation of approximately 600 kg of cow dung, 50 kg of kitchen waste, and leftover food per day, respectively. Based on the above analysis, a 45-cubic meter KVIC biogas plant was designed and installed to process livestock manure and agricultural residues efficiently for INR 12.00 lakh from SBM-G.

Integration with Circular Economy

The plant utilizes anaerobic digestion technology to convert organic waste into biogas, providing a renewable energy source while minimizing environmental pollution. Additionally, a structured training program was conducted for staff members, ensuring effective plant operation, maintenance, and safety management.

Replicability and Scalability

The plant serves as a model for rural waste management and sustainable energy solutions. By effectively utilizing the waste generated in the college goshala, the project has demonstrated the viability of biogas technology under the SBM-G GOBARdhan. The success of this initiative highlights the potential for replication in other rural areas, contributing to a cleaner environment, improved sanitation, and enhanced energy security.

Impact

- The plant efficiently converts organic waste into 12 kg of biogas per day, along with approximately 1,500 liters of liquid slurry and 100 kg of solid organic manure, significantly reducing environmental pollution.
- The reduction in methane emissions from decomposing waste contributes to climate change mitigation.
- Reduced energy costs and the use of organic manure in agriculture have provided economic advantages.

To know more

Contact

KL Prabhu Mahalingaiah
Sarpanch,
Kunnur Gram Panchayat
kannuru.mgd.rmnr@gmail.com

Indore's BioCNG Breakthrough: Turning Wet Waste into Green Fuel

State/UT	Madhya Pradesh
Urban Local Body	Indore Municipal Corporation
Department/ Organisation	Directorate of Urban Administration and Development, Madhya Pradesh
Duration	Since February 2022

Introduction

Indore's 550 TPD BioCNG Plant is a pioneering initiative under the city's Zero Waste Discharge Model, aimed at transforming organic waste into valuable resources. Established through a public-private partnership, the plant converts wet waste into BioCNG and CO_2, reducing landfill dependency and contributing to environmental sustainability. Indore Municipal Corporation oversees waste transportation and project monitoring, while a private concessionaire, in collaboration with a German technology partner, manages plant operations. Financial support comes from HDFC Bank and Green Fund (GoI & GoUK Partnership). Regulatory compliance is ensured by the Madhya Pradesh Pollution Control Board, and Avantika Gas Ltd. facilitates BioCNG distribution. Public transport operators use the BioCNG for cleaner mobility.

Activities

The project focuses on sustainable waste management by converting 550 tonnes per day (TPD) of organic waste into BioCNG, compost, and CO_2. Advanced bio methanation technology ensures high methane purity, making the BioCNG suitable for public transport and commercial use. Additionally, the initiative promotes source segregation, renewable energy adoption, and revenue generation through waste-derived products.

Integration with Circular Economy

The initiative promotes circular economy principles by producing 17 TPD of BioCNG for green fuel, 100 TPD of compost for agriculture, and capturing CO_2 for potential industrial use. Additionally, 75 percent of treated wastewater is reused within plant operations, while solar energy powers 20 percent of the facility, reducing electricity costs and dependency on fossil fuels.

Replicability and Scalability

Indore's model can be replicated in many cities by ensuring 100 percent source segregation, adequate land availability, and strong PPP frameworks. Scaling up includes expanding Indore's capacity to 800 TPD, setting up decentralised BioCNG plants, implementing policy-level reforms, and promoting carbon credit trading.

Impact

- Reduction of 1,30,000 tonnes of CO_2 emissions annually, landfill diversion with only 1 percent of inorganic impurities reaching dumpsites, and conservation of land and water ecosystems.
- Cleaner environment, reduced disease outbreaks, job creation in waste management and compost sales, and community participation in waste segregation.
- INR 25,000,000 monthly revenue, INR 14,000,000 in operational expenses, INR 25,200,000 annual royalty to IMC, INR 3,00,000 – 4,00,000 monthly savings via solar power.

To know more

Contact

Abhilash Mishra, IAS
Additional Commissioner,
Indore Municipal Corporation
indore.cleanestcity@gmail.com

Rewa's Energy Makeover: Converting Trash Into Treasure

Introduction

The Rewa Integrated Solid Waste Management (ISWM) project is a sustainable waste management initiative that transforms municipal solid waste into compost and energy. Through a Public-Private Partnership (PPP) model, the project has established a 350 TPD Waste-to-Energy (WTE) plant, reducing landfill dependency while contributing to economic and environmental sustainability.

Activities

The initiative processes approximately 1,24,000 tonnes of municipal solid waste annually, generating renewable energy and reducing environmental pollution. The project contributes to achieving multiple Sustainable Development Goals (SDGs), including clean energy, responsible consumption, and climate action. The initiative involves key stakeholders ensuring its success. MoHUA provides grant support under Swachh Bharat Mission, while the Directorate of Urban Administration and Development, Madhya Pradesh, acts as the tendering authority. Rewa Municipal Corporation oversees project monitoring, with Ramky Enviro Engineers Ltd. handling plant design and operations. MPPCB ensures regulatory compliance, and Madhya Pradesh Power Management oversees power purchase agreements. Grid connectivity is managed by Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company Ltd. MNRE offers custom duty exemptions, while the Directorate of Boilers and the Chief Electrical Inspectorate Division conduct annual inspections and audits.

Integration with Circular Economy

The project supports circular economy principles by converting waste into energy and compost. 30 TPD of compost is produced to enhance soil health and support organic farming. These efforts contribute to sustainable waste management while generating economic value from waste-derived resources.

Replicability and Scalability

Expansion plans include an RDF-based 6 MW WTE plants in Gwalior, Ujjain, and Indore, while policy reforms like net metering, capital grants, and GST exemptions can enhance financial viability. Collaborations with global institutions such as the World Bank, ADB, and UNDP can further support knowledge exchange and best practice adoption.

State/UT	Madhya Pradesh
Urban Local Body	Rewa Municipal Corporation
Department/ Organisation	Directorate of Urban Administration and Development, Madhya Pradesh
Duration	Waste-to-Compost since December 2022 & WTE since February 2024

Impact

- By converting waste into energy, the plant reduces 1,24,000 tonnes of CO_2 emissions annually, potentially generating INR 80,000,000 in carbon credits. This aligns with sustainability goals while minimising landfill waste and its associated environmental hazards.
- The project fosters a cleaner environment, reduces disease outbreaks, and provides employment opportunities in waste collection, plant operations, and compost sales. Community engagement in waste segregation enhances public awareness and participation.
- The WTE plant generates over 400,00,000 units of electricity annually, valued at INR 21,000,000, demonstrating the financial viability of waste-to-energy conversion.

To know more

Contact

Saurabh Sanjay Sonawane (IAS)
Commissioner,
Rewa Municipal Corporation
commrewa@mpurban.gov.in

Powering Cities with Waste: Jabalpur's 600 TPD Waste-to-Energy Success

Introduction

The 600 TPD Waste-to-Energy (WTE) Plant in Jabalpur is a pioneering initiative aimed at sustainable and efficient waste management. By utilising mass-burning technology, the plant processes 600 tonnes per day of municipal solid waste to generate 11.5 MW of electricity per hour, reducing landfill burden and promoting environmental sustainability. The Jabalpur Municipal Corporation (JMC) oversees waste collection and provides land on lease, while Jabalpur MSW Pvt. Ltd. (Essel Infra Projects Pvt. Ltd.) manages plant operations. Hitachi Zosen (Japan) supplies the core technology, with financial institutions funding the INR 1,780,000,000 investment. The Madhya Pradesh Pollution Control Board ensures regulatory compliance, and other key stakeholders include the Ministry of New and Renewable Energy, Directorate of Boilers, and Chief Electrical Inspectorate Division.

Activities

The project ensures efficient waste processing, energy generation, and environmental sustainability, contributing to eight Sustainable Development Goals (SDGs), including Affordable and Clean Energy (Goal 7) and Climate Action (Goal 13). Developed under a Public-Private Partnership (PPP) with Essel Infra Projects Pvt. Ltd., it operates with an INR 1,780,000,000 capital investment and employs advanced Hitachi mass-burning technology. Municipal solid waste is collected, incinerated, and converted into electricity, which is supplied to the Madhya Pradesh Power Management Company Limited. Air pollution control systems ensure compliance, while ash residues are repurposed. Regular monitoring and maintenance sustain long-term efficiency and safety over the project's 20-year operational lifespan.

Integration with Circular Economy

The plant processes 2,16,000 tonnes of solid waste annually, significantly reducing landfill dependency. Incineration ash is repurposed into construction materials like bricks and tiles, supporting resource conservation.

Replicability and Scalability

Cities like Gwalior, Bhopal, Indore, Pune, Surat, and Mumbai can adopt this model with modifications of door-to-door waste collection, sufficient land availability, a strong PPP framework, and regulatory support.

State/UT	Madhya Pradesh
Urban Local Body	Jabalpur Municipal Corporation
Department/ Organisation	Directorate of Urban Administration and Development, Madhya Pradesh
Duration	Project initiated in February 2014 and completed in February 2016

Impact

- Reduces greenhouse gas emissions by approximately 1 ton of CO_2 per ton of waste processed.
- Generates 2.40 lakh carbon credits annually, contributing to an additional INR 15+ crore in revenue.
- Minimises landfill usage, enhancing waste management efficiency.

- Creates employment for skilled and unskilled workers in waste collection and plant operations.
- Improves public health by reducing waste accumulation and related disease outbreaks.
- Encourages community engagement in source segregation and responsible waste disposal.

- Generates over 80,000,000 units of electricity annually, valued at INR 510,000,000.

To know more

Contact

Preeti Yadav (IAS)
Commissioner,
Jabalpur Municipal Corporation
commjabalpur@mpurban.gov.in

Pune's Green Energy Hub: From Food Waste to Fuel

Introduction

The Compressed Biogas (CBG) plant in Pune was established with the objective of processing municipal solid waste (MSW) to generate renewable energy while addressing urban waste management challenges. With a design capacity of 300 MTPD, the plant plays a crucial role in reducing landfill waste, mitigating greenhouse gas emissions, and creating economic opportunities.

Activities

The Pune CBG plant was the first facility to supply CBG under the Sustainable Alternative Towards Affordable Transportation (SATAT) program initiated by the Ministry of Petroleum & Natural Gas. To date, it has processed over 180,000 tons of food waste, converting it into more than 7,000 tons of compressed biogas. The operational process includes secondary segregation, slurry preparation, and anaerobic digestion to produce biogas.

The processed slurry is transported in closed tankers to the CBG processing plant in Talegaon MIDC, 35 km away. The plant, operated by Noble Exchange LLP, has an investment of INR 65,00,00,000 and functioning capacity of approximately 150 MTPD, primarily processing cooked food waste to enhance biogas yield. The CBG production stands at around 5 MTPD, supplied to oil sector PSUs like Indian Oil and GAIL. The organic manure generated as a by-product is registered under the "Pradhan Mantri Bhartiya Jan Urvarak Pariyojana" and marketed through Rashtriya Chemicals and Fertilisers.

Integration with Circular Economy

The anaerobic digestion process converts organic waste into biogas, a renewable energy source that reduces dependency on fossil fuels. The by-products, such as organic manure, support sustainable agriculture by enriching soil fertility and reducing reliance on chemical fertilizers.

Replicability and Scalability

The Pune Municipal Corporation (PMC) is planning to establish another facility with a design capacity of 350 TPD. With Pune generating approximately 1,000 TPD of wet waste, additional CBG plants will play a crucial role in sustainable waste management. The initiative can be replicated across other Indian cities by leveraging similar PPP models, securing policy support, and ensuring strategic land allocation for waste processing facilities.

State/UT	Maharashtra
Urban Local Body	Pune Municipal Corporation
Department/ Organisation	Solid Waste Management (SWM) Department, PMC
Duration	Since 2019

Impact

- Environmentally, the project mitigates climate change by preventing methane emissions from decomposing organic waste in landfills. The reduction in fossil fuel consumption further decreases carbon emissions. Additionally, policy alignment with SWM Rules 2016 ensures scientific waste processing, fostering long-term environmental and public health benefits.
- It supports local communities by integrating waste management with energy production, creating employment opportunities, and reducing waste transportation costs.
- The initiative enhances economic resilience by generating revenue through CBG sales and organic manure distribution.

To know more

Contact

Sanjay Kulkarni
Chief Engineer, Environmental Department
Pune Municipal Corporation
environment@pcmcindia.gov.in

Turning Waste into Watts: Pimpri-Chinchwad's Waste-to-Energy Transformation

Introduction

The Pimpri-Chinchwad Municipal Corporation (PCMC) Waste-to-Energy (WTE) project was developed to address the city's growing municipal solid waste (MSW) problem while overcoming land constraints for waste disposal.

Activities

PCMC established an Integrated Solid Waste Management Facility, that includes a Material Recovery Facility (MRF) and a WTE plant, under a Public-Private Partnership (PPP) with Antony Lara Renewable Energy Pvt. Ltd. This 21-year project involves the development, operation, maintenance, and management of the facility in compliance with Swachh Bharat Mission guidelines.

The MRF, with a capacity of 1,000 TPD, segregates municipal waste into biodegradable and recyclable components. Recyclables are sold to generate revenue, reducing the burden on landfills, while biodegradable waste is used as feedstock for the WTE plant. The WTE plant, with an initial capacity of 600 TPD, employs Rankine Cycle-based technology to generate 14.5 MW of electricity. The energy is utilised for municipal operations, including water and sewage treatment plants, at a cost-effective rate. Residual non-recoverable waste is safely disposed of in sanitary landfills equipped with leachate treatment facilities.

Integration with Circular Economy

Waste processing through anaerobic digestion and thermal treatment diverts approximately 500-700 metric tons of municipal waste daily from disposal sites. The generated energy, approximately 14 MW, is either supplied to the local grid or used for municipal operations, reducing reliance on conventional power sources.

Replicability and Scalability

The initiative is easily replicable in other urban areas with similar waste generation patterns. Solid Waste Management Rules 2016 supports nationwide adoption. With municipal support, structured financing, and adaptable technology, similar projects can promote cleaner cities, reduced landfill use, and improved energy security in India and globally.

State/UT	Maharashtra
Urban Local Body	Pimpri-Chinchwad Municipal Corporation (PCMC)
Department/ Organisation	Environmental Department, PCMC
Duration	Since 2018

Impact

- The environmental benefits of the WTE project include reduced landfill dependency, minimised greenhouse gas emissions, and enhanced resource efficiency. By processing non-recyclable waste into energy, the project significantly lowers methane emissions and aligns with PCMC's climate action goals.
- Socially, the initiative generates employment opportunities in waste management, energy production, and operational roles, fostering economic development.
- The financial sustainability of the project is ensured through multiple revenue streams, including tipping fees, recyclables sales, and energy generation. The model also contributes to reduced electricity costs for municipal services, enhancing economic resilience.

To know more

Contact

Sanjay Kulkarni
Chief Engineer, Environmental Department,
Pimpri-Chinchwad Municipal Corporation (PCMC)
environment@pcmcindia.gov.in

Fuelling Growth: The Economic and Environmental Benefits of Jaipur's Biogas Project

State/UT	Rajasthan
Urban Local Body	Municipal Corporation Jaipur Heritage
Department/ Organisation	Local Self Government Department (LSGD), Rajasthan
Duration	Minimum 20 years

Introduction

The Municipal Corporation Jaipur Heritage (MCJH) has established a Compost Biogas Plant (CBG) at Hingoniya Gaushala to process organic waste through anaerobic digestion. The plant, with a capacity of 100 tons per day, is spread over 5,269 sq. m and is designed to convert the organic waste fraction of municipal solid waste into biogas and compost. This initiative serves as an eco-friendly alternative for waste management, reducing landfill burden while generating renewable energy and compost for agricultural use. The key stakeholders involved in this project are MCJH, farmers and Indian Oil Company Limited.

Activities

The CBG, operated by the MCJH, utilizes anaerobic digestion technology, the plant produces both biogas and compost, contributing to sustainable waste management.

Integration with Circular Economy

The project focuses on recycling organic waste from municipal solid waste (MSW) to produce biogas and compost, promoting sustainable waste management. The compost generated is utilized for agricultural purposes, enhancing soil fertility and reducing the need for chemical fertilizers. Additionally, the biogas produced serves as a renewable energy source, reducing dependence on fossil fuels and contributing to a cleaner, more sustainable environment.

Replicability and Scalability

The project demonstrates high potential for replication in major cities of Rajasthan, including Jodhpur, Kota, Udaipur, Ajmer, Bikaner, and Bharatpur, where effective organic waste management is a pressing priority. By implementing similar plants in these urban areas, local governments can enhance sustainable waste processing, promote renewable energy generation, and improve overall environmental outcomes. This scalability makes the initiative a viable solution for addressing the challenges of organic waste management across the state.

Impact

- The project has a positive environmental impact by significantly reducing greenhouse gas emissions, including CO_2 and Methane, thereby contributing to climate change mitigation.
- The initiative has a financial impact by generating revenue through the sale of biogas and compost, making waste management both economically viable and environmentally sustainable.

To know more

Contact

Arun Kumar Hasija
Municipal Commissioner,
Nagar Nigam Jaipur Heritage
commissioner.nnjh@rajasthan.gov.in

From Waste to Fuel: Rajasthan Goes Green

State/UT	Rajasthan
Urban Local Body	Local Self Government Department, Rajasthan
Department/ Organisation	Local Self Government Department, Rajasthan State Pollution Control Board (RSPCB) Centralized RDF Processing Facility- Green Gene Recyclers Private Limited
Duration	Ongoing

Introduction

The initiative aims to provide a sustainable solution for municipal solid waste management by promoting the circular economy. It focuses on converting municipal waste into Purified RDF (Sustainable Alternate Fuel), compost, and recycled aggregates to reduce landfill dependency, improve public health, and enhance urban air quality. The project also aligns with the Swachh Bharat Mission (SBM) and contributes to reducing greenhouse gas (GHG) emissions. Key stakeholders include government bodies like the Local Self Government Department, ULBs, and RSPCB, Green Gene Recyclers, cement industries, and bio-mining contractors.

Activities

The initiative focuses on efficient municipal solid waste (MSW) management through bio-mining of legacy waste and daily collection and processing of fresh waste across Rajasthan and Delhi. Advanced technologies are used to convert MSW into purified Refuse-Derived Fuel (RDF) at facilities in Chittorgarh and Neemrana. The purified RDF serves as a sustainable alternate fuel (SAF) for cement industries, power plants, and other energy-intensive sectors, reducing reliance on coal and pet coke. Additionally, construction and demolition (C&D) waste is recycled into aggregates for road and building construction, grinding units, and cement plants. Compost is also produced from inert waste, enhancing soil quality for agriculture and horticulture applications. The initiative ensures proper handling of by-products and promotes sustainable waste utilization to achieve zero waste generation.

Integration with Circular Economy

This initiative supports the circular economy by converting waste into RDF, compost, and recycled aggregates, reducing landfill dependency and promoting sustainable reuse. Purified RDF serves as a clean energy alternative, cutting fossil fuel reliance and GHG emissions. Recycling C&D waste reduces demand for natural resources, while composting enhances soil fertility.

Replicability and Scalability

The model is replicable in other states through partnerships with ULBs, cement industries, and power plants enabling regional adaptation.

Impact

- Reduced landfill dependency, zero wastewater discharge, lower demand for raw materials, and improved air quality with 45 percent carbon intensity reduction by 2030. High-calorific RDF (more than 4500 CV) ensures a stable alternative fuel supply, cuts reliance on imported coal, and lowers operational costs.
- Employment generation, enhanced waste processing, and contribution to Swachh Bharat Abhiyan through clearance of legacy waste.

To know more

Contact

Mr. Priyesh D. Bhatti
Director, Enviro Office,
Local Self Government Department, Rajasthan
priyeshbhatti@luthraindia.com

Gwalior Tackles Cattle Dung: 100 TPD at a Time

Introduction

A 100 TPD Cattle Dung-Based Compressed Bio Gas (CBG) Plant at Adarsh Gaushala, Laltipara, Gwalior, has been established by Gwalior Municipal Corporation (GMC). It aimed at transforming organic waste into a valuable renewable energy source. Developed in collaboration with IOCL and Nutzen Engineering Solutions, the project integrates circular economy principles by recycling organic waste, minimizing methane emissions, and generating high-value by products.

Activities

The CBG plant at Adarsh Gaushala is designed to process 100 tons per day of cattle dung, supplemented by approximately 15 to 20 tons per day of the organic waste, which will be supplied to the plant premises by GMC. The primary output of this facility is Compressed Bio Gas, a renewable and eco-friendly energy source. Additionally, the plant will generate Solid and Liquid Fermented organic manure as byproducts, which is a nutrient-rich organic manure that can significantly benefit agricultural practices by promoting organic farming.

Integration with Circular Economy

The integration of renewable energy with circular economy principles—through waste valorization and the production of value-added products—makes it an ideal candidate for scaling in both rural and urban contexts.

Replicability and Scalability

This model has significant potential for replication in other regions with similar agricultural setups and waste management challenges. The plant's capacity can be incrementally increased by expanding its waste processing infrastructure to handle more organic waste. The model can be scaled up regionally or nationally by replicating it across other agricultural hubs, dairies, and waste-producing areas.

State/UT	Madhya Pradesh
Urban Local Body	Gwalior Municipal Corporation
Department/ Organisation	Gwalior Municipal Corporation
Duration	2024

Impact

- It contributes to the reduction of greenhouse gas (GHG) emissions by utilizing organic waste to generate renewable energy, reducing methane emissions from untreated organic matter. The plant's byproducts—solid and liquid organic manure—will contribute to sustainable agricultural practices.
- The project provides energy access to the local community. It also presents an opportunity for job creation and skills development in the renewable energy and waste management sectors.

To know more

Contact

Shelendra Saxena
Assistant Engineer,
Gwalior Municipal Corporation
nn.gwalior@mpurban.gov.in

Transforming Bihar through GOBARdhan Yojana: A Sustainable Approach

Introduction

The GOBARdhan Yojana in Bihar addresses multiple objectives, including providing sustainable fuel, illuminating village streets, improving environmental cleanliness, and reducing germ-borne diseases. The initiative has established operational units in 31 districts, contributing to sustainable development by producing biogas, electricity, and manure. The GOBARdhan Yojana not only addresses the immediate need for sustainable fuel but also fosters a circular economy by promoting the use of organic fertilizers in agriculture. This holistic approach aligns with the state's commitment to environmental stewardship and rural development.

Similarly, in other districts, biogas is being distributed to homes, providing a sustainable and eco-friendly alternative for cooking fuel.

Activities

The GOBARdhan Yojana in Bihar involves the establishment of biogas production units across 31 districts, generating sustainable fuel, electricity, and organic manure. These units supply biogas to educational institutions, homes, and businesses, reducing reliance on conventional fuels and promoting environmental sustainability. Additionally, the initiative enhances waste management by efficiently utilizing organic waste and fostering a circular economy through the use of organic fertilizers in agriculture.

Integration with Circular Economy

By converting organic waste into valuable resources like biogas and manure, the initiative strengthens the circular economy, ensuring sustainable resource utilization and minimal environmental impact.

Replicability and Scalability

The Yojana represents a sustainable revolution in Bihar, showcasing the effective management of organic waste for renewable energy generation and agricultural enhancement. By promoting the use of biogas, electricity, and organic fertilizers, the initiative contributes to environmental sustainability, rural development, and improved quality of life for communities. Its success underscores the potential for innovative solutions to address complex challenges while fostering a circular economy.

State/UT	Bihar
Department/ Organisation	Department of Drinking Water & Sanitation

Impact

- Specific examples include the production of 10 KV of electricity daily in Kotwa block (East Champaran), supplying biogas to educational institutions.
- In Giriyak block of Nalanda district, the GOBARdhan unit in Ghazipur Gram Panchayat is supplying biogas to Kasturba Girls Residential School. This not only serves as a cleaner and sustainable fuel source but also contributes to the efficient management of cow dung and other kitchen organic waste.
- The GOBARdhan unit in Balesara Gram Panchayat, located in Uchka village block of Gopalganj district, is supplying biogas for fuel to Jawahar Navodaya Vidyalaya. This ensures the preparation of meals for 200-250 students, fostering a green and ecofriendly environment.
- GOBARdhan units in Barauni-I Gram Panchayat of Teghra block in Begusarai district are supplying biogas to local cowsheds, restaurants, and homes.

To know more

Contact

Mr. Rajesh Tiwari
Deputy Secretary,
Department of Drinking Water & Sanitation
nodalofficersbmbihar1@gmail.com

Alternate Fuel for Alternate Future: Chittorgarh's Journey

Introduction

This initiative focuses on the pre-processing of hazardous and non-hazardous industrial waste to produce alternate fuel (AFR), reducing dependency on fossil fuels and minimizing environmental impact. The project aims to improve public health, environmental quality, and resource conservation by promoting sustainable waste management and co-processing in cement kilns.

Activities

Operational at Chittorgarh since 2018, the facility produces approximately 6,000 TPM of alternate fuel. The key activities include hazardous waste collection from industries, transportation to the pre-processing facility, quality analysis through random and composite sampling, and the manufacturing of alternate fuel. The processed fuel is then supplied to cement plants as an energy-efficient and eco-friendly substitute for coal and pet coke. The initiative ensures compliance with CPCB and MoEF&CC guidelines, promotes uniform quality supply, and eliminates the need for landfill or incineration. Additionally, advanced blending techniques and digital tracking through GPS and blockchain ensure transparency and efficiency.

Integration with Circular Economy

The initiative plays a crucial role in the circular economy by utilizing industrial waste as an alternative fuel and raw material. By co-processing waste in cement kilns, it achieves zero-residue disposal, eliminating incineration ash and landfill dependency. This approach promotes industrial symbiosis, where waste from one industry serves as a resource for another, fostering sustainable business models.

Replicability and Scalability

The model can be replicated through standardized policies and incentives for industries adopting. Co-processing can facilitate smooth implementation. Establishing decentralized pre-processing facilities near industrial hubs can minimize transportation costs and increase efficiency. Public-Private Partnerships (PPP) and policy-level interventions will play a key role in scaling the initiative, ensuring long-term sustainability.

State/UT	Rajasthan
Department/ Organisation	Rajasthan State Pollution Control Board (RSPCB) Centralized Alternate Fuel Resource Facility- Green Gene Enviro Protection Infrastructure Private Limited, Chittorgarh-Rajasthan
Duration	Ongoing

Impact

- Reduces landfill waste, mitigates GHG emissions (1.37 million MT of CO_2 reduced), conserves fresh water (284,846 KL saved), and eliminates wastewater discharge. The project also contributes to cleaner air quality and a reduced carbon footprint.
- Creates employment in waste collection, transportation, and processing, supporting livelihoods in the waste management sector.
- Reduces coal import dependency for cement manufacturers, minimizes waste disposal costs, and enhances energy security.

To know more

Contact

Mr. Priyesh D. Bhatti
Director Enviro Office,
Rajasthan Pollution Control Board
priyeshbhatti@luthraindia.com

Scaling Sustainability: Bringing Jaipur's Circular Economy Vision to More Cities

Introduction

The Municipal Corporation Greater Jaipur (MCGJ), in collaboration with Bharat Petroleum Corporation Ltd. (BPCL), has undertaken an innovative Liquid Waste to Energy (Bio-Methanation) project. This initiative focuses on utilizing used water for bio-methanation to generate biogas and revenue from waste. This is India's first integrated project installed in a single premise, featuring an STP of 215 MLD capacity, a biogas-based 2.4 MW power generation plant, a biogas-based CNG bottling plant, and a 1.5 MW solar power plant.

Activities

Under the Biogas Purchase Agreement, BPCL purchases biogas from MCGJ at a variable price linked to the petroleum index, ensuring a market-driven approach to pricing. As part of the Biogas Supply Commitment, MCGJ guarantees a minimum daily supply of 6,500 NM^3 of raw biogas to BPCL, ensuring a steady and reliable feedstock for energy production. To facilitate project implementation, Land Allocation was made by MCGJ, providing adjacent land for BPCL to set up the necessary plant infrastructure. BPCL assumes full responsibility for capital (CAPEX) and operational (OPEX) expenditures, reducing the financial burden on MCGJ. The entire initiative operates under a Concession Period of 25 years, structured as a Public-Private Partnership (PPP) model.

Integration with Circular Economy

The project promotes reuse of treated wastewater for agricultural purposes, ensuring efficient water resource management and reducing freshwater demand for irrigation. Additionally, it enables the recovery of biogas from liquid waste, which serves as a sustainable energy source, thereby reducing dependency on fossil fuels and contributing to a cleaner environment.

Replicability and Scalability

The project has significant potential for replication in major cities of Rajasthan, including Jodhpur, Kota, Udaipur, Ajmer, Bikaner, and Bharatpur, where similar waste-to-energy solutions can be implemented to enhance sustainability.

State/UT	Rajasthan
Urban Local Body	Municipal Corporation Greater Jaipur (MCGJ)
Department/ Organisation	Local Self Government Department (LSGD), Rajasthan
Duration	25-year concession period

Impact

- The project reduces greenhouse gas emissions (CO_2 & Methane), improves sanitation and urban cleanliness.
- The project generates revenue through biogas sales while decreasing energy dependency.

To know more

Contact

Arun Vyas
Chief Engineer,
LSGD, Rajasthan
arunvyas2001@yahoo.co.in

LEGACY WASTE MANAGEMENT AND DUMPSITE REMEDIATION

Dumpsites have historically been a common feature of Indian cities, with decades of unmanaged waste piling up unsupervised along a large stretch of land. This has led to severe environmental and health hazards, polluting local neighbourhoods. India's journey in legacy waste management has evolved significantly over the past few years, reflecting the country's increasing awareness towards environmental sustainability and its prioritisation of maintaining a clean and safe environment for all. With the launch of the Swachh Bharat Mission, significant strides have been made in addressing the issue of legacy waste through innovative waste management and dumpsite remediation practices. Land reclamation, leachate management, and waste stabilisation are a few prominent approaches that are being implemented to transform these hazardous legacy waste sites into sprawling, vibrant green zones.

Reclaiming Dumpsites: Goa's Waste Management Initiatives

State/UT	Goa
Urban Local Body	Goa Waste Management Corporation (GWMC)
Department/ Organisation	Goa Waste Management Corporation (GWMC)
Duration	2016 to 2025

Introduction

The Goa Waste Management Corporation (GWMC) was established in 2016 as a Special Purpose Vehicle under the Department of Science & Technology & Waste Management, Government of Goa. It aims to facilitate the systematic and scientific management of solid waste, E-waste, biomedical waste, hazardous waste, construction and demolition (C&D) waste. GWMC is also empanelled as a Swacchata Knowledge Partner (SKP) under SBM 2.0 by the Ministry of Housing and Urban Affairs (MoHUA).

Activities

GWMC has established integrated solid waste management facilities, including the Saligao Facility (250 TPD), generating 28,000 units of electricity and 7-8 tons of compost per day. The Cacora Facility (100 TPD), generates 10,000 electricity units and 2-3 tons of compost daily. GWMC also operates specialized treatment facilities such as a Biomedical Waste Facility in Kundaim IDC, Ponda, treating 5-6 tons per day and a Hazardous Waste Facility in Pissurlem, with a secured landfill of 25,000 TPA capacity and incineration of 1.5 Ton/hour.

Integration with Circular Economy

GWMC's circular economy initiatives emphasize biomethanation, energy recovery, and recycling. The Saligao and Cacora facility has treated over 5,07,000 and 31,000 tons of waste, generating more than 3,79,00,000 and 38,00,000 electricity units respectively. The compost production supports sustainable agriculture, with 8 TPD compost at Saligao and 3 TPD at Cacora. The POTI initiative (Protection of Oceans, Trees & Inhabitants) promotes textile recycling, collecting 500 kg of cloth waste daily, offering recycled cloth bags in exchange. The Plastic Waste Management Programme at Bicholim, processes 60 to 65 tons of recyclable waste monthly, generating Rs. 5,00,000 – 5,50,000 in revenue and employing 42 workers. Goa has become the first state initiating the Deposit Refund System (DRS), under the amended Goa Non-Biodegradable Garbage Control Act.

Replicability and Scalability

The success of Goa's waste management model highlights its potential for replication in other states with land constraints. Further scalability can be achieved through expanding waste treatment facilities, decentralized waste collection, community participation, technology adoption, and policy implementation.

Impact

- Reduction in landfill dependency, conservation of resources, reduction in GHG emissions, and restoration of ecological balance through legacy waste remediation.
- Improved public health and hygiene, increased community awareness, and employment generation in the waste management sector.
- Revenue generation through compost, biogas, and recyclables, with long-term cost reduction in waste management.

To know more

Contact

Ankit Yadav, IAS
Managing Director,
Goa Waste Management Corporation
gwmc.goa@gov.in

Puducherry's Legacy Waste Remediation: 16.90 Acres of Land Reclaimed

State/UT	Puducherry
Urban Local Body	Pondicherry Municipality & Oulgaret Municipality – Cluster Based
Department/ Organisation	Local Administration Department (LAD), Government of Puducherry
Duration	January 2022 to April 2023 & October 2023 to July 2024

Introduction

The Government of Puducherry, through its Local Administration Department (LAD), has undertaken the Legacy Waste Remediation Project to address accumulated municipal solid waste (MSW) in the region. This initiative aims to remediate 8.93 metric tonnes of legacy waste and reclaim 16.90 acres of land using bio-mining and bio-remediation techniques.

Activities

The remediation process involved a topographic survey to assess waste depth, followed by excavation, windrow turning, and waste processing. Legacy waste was separated into fractions, including inert materials, compost, recyclables, and refuse-derived fuel (RDF). Microorganisms were used to degrade organic contaminants before excavation, reducing toxicity and volume. To accelerate the process, three advanced trommel units were installed. Technological solutions were deployed for mapping, monitoring, and assessing environmental parameters such as gas emissions, temperature, and leachate levels to ensure responsive and effective waste management.

Integration with Circular Economy

A Closed-loop system focuses on reducing waste, reusing materials, and recycling resources to create a sustainable cycle. Enhancing resource efficiency minimizes waste generation, lowers raw material consumption, and promotes responsible land use. Adopting a systemic thinking approach ensures that waste remediation considers its interconnected environmental, economic, and social impacts, leading to more sustainable and holistic waste management solutions.

Replicability and Scalability

The project's success can be replicated in other cities with similar contamination profiles, geology, and hydrology. Scalability depends on achieving 100 percent processing of legacy waste and ensuring continuous treatment of fresh MSW. The Integrated Municipal Solid Waste Management Project at Kurumbapet Resource Recovery Site, operational since February 2024, demonstrates the viability of large-scale waste processing and serves as a model for expansion under SBM (U) 2.0.

Impact

- Reduces hazardous waste and landfill dependency.
- Prevents pollution and protects ecosystems.
- Restores natural resources like soil, water, and air.
- Lowers greenhouse gas emissions.
- Improves public health by reducing exposure to hazardous substances.
- Restores ecosystem services such as water filtration and biodiversity conservation.
- Facilitates economic development by repurposing remediated sites.
- Increases property values, making areas attractive for investment.

To know more

Contact

S. Shakthyvel
Director (Local Administration) &
Mission Director (SBM – Urban 2.0)
dirlad@py.gov.in

From Dumpsite to Green Space: A Model for Uttarakhand's Waste Management

Introduction

The Dumpsite Remediation for Solid Waste Management project is the first legacy waste clearance initiative in Uttarakhand. The aim was to remediate and reclaim the dumpsite through bio-mining and bioremediation while ensuring safe waste disposal and environmental restoration. The project eliminated 2,55,000 MT of waste and transformed the site into usable green space. It aligns with circular economy principles by recovering recyclables, reducing landfill dependency, and improving urban infrastructure. The initiative was executed through collaborative efforts involving municipal authorities, private partners, urban planners, engineers, and the SWM department, ensuring efficient coordination and long-term impact.

Activities

The dumpsite remediation project utilizes techniques such as advanced segregation, processing, and treatment of waste, ensuring the recovery of valuable recyclables while mitigating soil and water contamination. Drone-based surveys were conducted for precise legacy waste quantification and tracking. An engineered landfill was developed with proper lining and leachate management systems. A major achievement of the project was the reclamation of 9,794.7 sq. meters (~1 hectare) of land, which was transformed into a green park with tree plantations and landscaped areas, promoting environmental sustainability.

Integration with Circular Economy

This project focused on waste-to-value strategies through the utilization of 13,552.91 MT of RDF, which was sent to Bahl Paper Mill, Kashipur, and Waste-to-Energy Plant, Jabalpur for alternative fuel use. It helped to repurpose 70,000 MT of bio-soil that was used for landfilling low-lying areas and sold to third parties for further use. Further, 10,054 MT of inert waste stored at Sailia Farm, Rudrapur, for future infrastructure needs.

Replicability and Scalability

This model is already being replicated in Nagar Nigam Roorkee and Nagar Nigam Kotdwar. Other Urban Local Bodies (ULBs) can adopt this framework by integrating bio-mining, resource recovery, and engineered landfill methods.

State/UT	Uttarakhand
Urban Local Body	Nagar Nigam Rudrapur
Department/ Organisation	Urban Development Department
Duration	Phase 1 (Feb 2020 – Oct 2022), Phase 2 (Feb 2023 – June 2023), Phase 3 (Dec 2023 – May 2024), Phase 4 (April 2024 – July 2024)

Impact

- 100 percent land recovery, converting a hazardous dumpsite into a clean, green park.
- Significant reduction in soil and groundwater contamination
- Reduction in GHG emissions by preventing methane emissions from open waste.
- Improved water quality in the Kalyani River, benefiting aquatic ecosystems.

- Reclaimed 1 hectare of land, increasing its urban and commercial value
- Revenue generation through the sale of RDF and bio-soil.
- Reduced municipal waste management costs through efficient waste remediation.

To know more

Contact

Naresh Durga Pal
Municipal Commissioner,
Nagar Nigam Rudrapur
nagarnigamrudrapur@gmail.com

Lucknow's Green Energy: Fresh Waste Processing and Legacy Waste Remediation

State/UT	Uttar Pradesh
Urban Local Body	Lucknow Municipal Corporation
Department/ Organisation	Bhumi Green Energy
Duration	3 years

Introduction

The Lucknow Municipal Corporation, in collaboration with Bhumi Green Energy, has undertaken an initiative for Fresh Waste Processing and Legacy Waste Remediation. The initiative is designed to manage 18,50,000 metric tons of waste over three years, processing approximately 2100 TPD (tons per day).

Activities

A preliminary site assessment and preparation was undertaken which included waste quantification and density testing of dumpsites to determine the extent of landfill excavation required. The landfill is then zoned systematically to facilitate phased excavation and efficient waste processing. During excavation and screening, excavators and trommel screens (6mm, 22mm) are deployed to separate waste fractions The recovered by-products are strategically utilized—6mm bio-soil is used for land reclamation and soil enrichment, refuse-derived fuel (RDF) is supplied to cement industries like UltraTech, ACC, and Ambuja Cement, 22mm coarse fractions are repurposed for road construction and landfill layering, and in various construction projects. The reclaimed land is further treated, leveled, and compacted using bio-soil, and plantation drives are undertaken to restore green cover and enhance biodiversity. Strict compliance and monitoring protocols ensure adherence to Central Pollution Control Board guidelines and Solid Waste Management Rules 2016, with periodic emissions monitoring and regulatory reporting.

Integration with Circular Economy

The project maximizes resource recovery by transforming waste into economically valuable products such as compost, recyclables, and RDF, reducing dependence on raw materials.

Replicability and Scalability

Public-private partnerships (PPP), investments from industries, and technology-driven waste management practices can make the initiative scalable across different urban areas.

Impact

- Reduction in landfill burden, lower greenhouse gas emissions, and contribution to sustainable urban development.
- Creation of employment opportunities, improved hygiene conditions, and enhanced community participation in waste management.
- Revenue generation through the sale of recyclables, compost, and RDF.

To know more

Contact

Shambhuraj Pawar
Bhumi Green Energy
lucknowbhumigreenenergy@gmail.com

Greening Barren Lands: Rajkot's Circular Approach

State/UT	Gujarat
Urban Local Body	Rajkot Municipal Corporation
Department/ Organisation	Rajkot Municipal Corporation
Duration	Ongoing

Introduction

Gujarat's Rajkot generates approximately 700 tonnes of municipal solid waste per day all of which is dumped at the Nakrawadi waste dumping site. Due to systemic gaps between waste generation and processing, around 16,00,000 tonnes of legacy waste has accumulated. To tackle this challenge, Rajkot Municipal Corporation led the charge to recover the dumping site by converting it into a clean green urban forest.

Activities

Legacy waste processing techniques using machines such as screeners, splitters, and trommels. The waste was processed into refuse-derived fuel (RDF), semi-compost, and other inert materials. The RDF was transferred to Jamnagar's waste-to-energy power plant, the inert materials were sent to Secured Landfill (SLF) site, and 50,000+ tonnes of semi-compost was utilised for levelling the land and to help replenish and enrich the soil. Approximately 2,35,000 native and fast-growing tree species were planted. The Miyawaki plantation technique was used. A 12 km pipeline was laid to connect the land to the Gauridad Sewage Treatment Plant to initiate the supply of secondary treated water for irrigation. Water-harvesting ponds, drip irrigation systems and sprinkler systems were further installed to support groundwater recharge.

Integration with Circular Economy

This project demonstrates a circular economy approach by transforming a degraded dumpsite into a thriving eco-friendly urban space with enhanced biodiversity, promoting sustainability whilst addressing the challenge of legacy waste. The waste was processed into usable materials and valuable resources for the benefit of the 30-acre green transformation initiative.

Replicability and Scalability

The success of this project offers a potential for replication in other cities and regions that are facing challenges with legacy waste management, land degradation, and environmental restoration. The use of secondary treated water for irrigation via a dedicated pipeline can be replicated in areas with water scarcity, providing an efficient, sustainable water management solution. The integration of waste-to-energy systems, using RDF as a fuel source for power generation, can be adopted by other municipalities to reduce reliance on fossil fuels .

Impact

- Afforestation reduced airborne pollutants and improved air quality.
- High oxygen-releasing and carbon-adsorbing species were planted to counteract the effects of methane and carbon dioxide emissions.
- Fragrant plant species such as Neem, Champa, and Jasmine were planted to reduce landfill odours.
- Created natural habitats for birds and insects, promoting biodiversity.
- Encouraged community engagement through the introduction of walking trails and recreational green spaces.

To know more

Contact

Dipal Kathad
Manager, Solid Waste Management,
Rajkot Municipal Corporation
ieccellrmc@gmail.com

Reclaiming Garbage Vulnerable Points: Ghaziabad's Green Initiative

State/UT	Uttar Pradesh
Urban Local Body	Ghaziabad Nagar Nigam
Department/ Organisation	Ghaziabad Nagar Nigam

Introduction

The Ghaziabad Nagar Nigam (GNN) has taken an initiative to remediate Garbage Vulnerable Points (GVP). Key stakeholders include GNN as the lead authority, municipal departments handling urban planning and environmental services, environmental agencies and NGOs, local communities, horticulture experts and contractors.

Activities

The land remediation and allocation initiative focuses on identifying and rehabilitating secondary and GVP points, freeing up 193,643.53 sq. meters of encroached land across 16 locations in Indirapuram and Pratap Vihar. This reclaimed land is repurposed to establish 193 nurseries spanning 145,132 sq. meters. These nurseries are maintained with proper horticultural practices, ensuring the annual donation of 145,132 saplings to GNN . A key component of this project is the development of Miyawaki forests, with 3,43,461 trees planted to restore the urban ecosystem. Ongoing management involves regular assessment and optimization of nursery and forest operations, collaborating with environmental experts for sustainable improvements.

Integration with Circular Economy

The integration of a circular economy was ensured through repurposing waste materials and encroached land into valuable green spaces. Degraded areas are transformed into thriving nurseries and dense Miyawaki forests, enhancing urban biodiversity and sustainability. A sustainable loop is established by reinvesting revenue generated from nurseries into further urban greening efforts, reinforcing long-term ecological and economic benefits.

Replicability and Scalability

By integrating waste management with urban greening, it serves as a good practice for sustainable city development. Scalability is achievable through the expansion of nurseries, forming strategic partnerships with private entities, research institutions, and NGOs to enhance capacity. Securing additional funding through green bonds and public-private partnerships can further strengthen financial sustainability.

Impact

- Conserves resources, minimizes waste, reduces GHG emissions, improves air quality, and preserves biodiversity.
- Enhances community well-being and participation; increases urban green cover and aesthetic appeal.
- Generates significant revenue (INR 8,707,920 annually) supporting further urban greening projects.

To know more

Contact

Vikramaditya Singh Malik, IAS
Municipal Commissioner,
Ghaziabad Nagar Nigam
gzb.-nagar.nigam@gmail.com

From Dumpsite to Modern Facility: Tangmarg-Gulmarg Redefining Waste Management

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Committee Tangmarg-Gulmarg
Department/ Organisation	Municipal Committee Tangmarg-Gulmarg
Duration	Ongoing

Introduction

The Municipal Committee Tangmarg-Gulmarg has transformed an old legacy waste site through the process of bioremediation. With 90 percent of the construction work completed for the Sanitation Complex, providing amenities for sanitation workers, and promoting worker welfare.

Activities

A door-to-door waste collection system was implemented with source segregation, dedicated collection points, and worker training. A joint waste management plant with Kunzer Municipal Committee facilitated plastic waste sorting, recycling, and revenue generation while promoting responsible disposal. Scientific composting supported sustainable farming, and bioremediation transformed the legacy waste site into a sanitation complex with modern facilities—the first initiative of its kind in Jammu and Kashmir.

Integration with Circular Economy

The Tangmarg-Gulmarg Municipal Committee has integrated circular economy principles by collecting, processing, recycling, and selling waste while generating and utilizing compost.

Replicability and Scalability

This initiative can be scaled by expanding compost networks, bioremediation projects, waste processing facilities, and industry partnerships for sustainable waste management.

Impact

- Reduction in waste disposal costs and landfill management expenses.
- Reduction in landfill waste and restoration of degraded land.
- Improvement in soil health through the promotion and implementation of organic composting.

- Better living conditions for sanitation workers.
- Improved public participation in waste management initiatives.
- Increased employment opportunities in waste collection, processing, and composting.

- Revenue is generated from the sale of plastic waste and compost.

To know more

Contact

Mir Tafveez
Executive Officer,
Municipal Committee Tangmarg-Gulmarg
ulbk@yahoo.com

WASTEWATER MANAGEMENT

Wet or organic waste constitutes a large proportion of our daily waste stream, across industrial, commercial, and domestic spaces. Effective organic and wet waste management is crucial for achieving a sustainable urban environment. Emphasis on source segregation by using differently coloured bins for wet and dry waste (green and blue respectively) has enabled improved waste management across states, even at the household level. The Hon'ble Prime Minister Shri Narendra Modi's Mission LiFE promotes a lifestyle that protects the environment through individual actions. For organic and wet waste, methods like composting are gaining prominence. Initiatives like the India Organic Waste Management Programme (IOWMP) have successfully implemented innovative biogas technologies to enhance waste management and energy production in rural and urban areas. By integrating these practices into our daily lives and leveraging government initiatives such as the Swachh Bharat Mission, India can effectively manage organic waste, reduce environmental impacts, and foster a more sustainable future.

Visakhapatnam's Liquid Gold: Recycling Wastewater for a Sustainable Future

State/UT	Andhra Pradesh
Urban Local Body	Greater Visakhapatnam Municipal Corporation (GVMC)
Duration	Operational since 2021

Introduction

Water scarcity is a growing concern, but Visakhapatnam has taken an innovative leap by recycling treated wastewater for industrial and urban use. Since 2021, GVMC's initiative has been ensuring that every drop counts, reducing freshwater dependency while promoting sustainable water management. This initiative is the combined effort between GVMC, Andhra Pradesh Pollution Control Board (APPCB) and local industries and urban landscaping units.

Activities

GVMC installed Sewage Treatment Plants (STPs) with tertiary treatment capabilities, enabling the recycling of treated wastewater. This water is now supplied to industries, municipal parks, and roadside plantations. Public awareness campaigns were also launched to encourage water conservation efforts.

Integration with Circular Economy

By reusing treated wastewater, the initiative reduces the strain on freshwater resources while improving urban water sustainability. The recycled water supports industries and enhances greenery, ensuring that wastewater is not just disposed of but reused effectively.

Replicability and Scalability

This model is easily replicable in cities with high water demand and sewage treatment facilities. With modifications, smaller municipalities can implement mini-STPs for localised water recycling.

Impact

- 30 million litres of wastewater recycled daily, reducing pressure on freshwater sources.
- Ensures water availability for municipal green spaces, improving urban aesthetics and quality of life.
- Local industries benefit from a reliable water source at a lower cost, making operations more sustainable.

To know more

Contact

Dr. Dasaradharamreddy,
Chief Operating Officer,
Greater Visakhapatnam Municipal Corporation (GVMC)
visakhapatnamsmartcity@gmail.com

Zero Discharge, Maximum Impact – Navi Mumbai's Water Reuse Success

Introduction

Navi Mumbai Municipal Corporation (NMMC) has undertaken an initiative to ensure 100 percent wastewater treatment and reuse initiative to address rising water demand and environmental concerns.

Activities

Navi Mumbai has developed a 490.7 km sewer network and seven advanced STPs using SBR C-Tech technology with a 454 MLD capacity in Belapur, Nerul, Vashi, Sanpada, Koparkhairane, Ghansoli, and Airoli. Three Tertiary Treatment Plants (TTPs) at Koparkhairane, Airoli, and Nerul (45 MLD total) and an upcoming 7.5 MLD TTP at Belapur supply high-quality treated water for industrial and municipal use.

Under the Swachh Bharat Mission and AMRUT scheme, NMMC enhanced sanitation infrastructure by installing household, community, and public toilets and upgrading the sewerage network. A 177 km distribution network was established to supply treated water to MIDC under a strategic agreement, involving Navi Mumbai Municipal Corporation (NMMC), Maharashtra Pollution Control Board (MPCB), Maharashtra Industrial Development Corporation (MIDC), Local industries, residents and Agencies using treated water.

Integration with Circular Economy

Over 30 percent of treated wastewater is repurposed for gardening, road cleaning, washing buses, and industrial processes, reducing the burden on freshwater sources. The use of advanced technologies such as SBR, ultra-filtration, and ultraviolet disinfection and regular testing at NABL-accredited laboratories ensures high-quality treated water suitable for non-potable applications.

Replicability and Scalability

Cities can initiate similar projects by developing STPs and TTPs, establishing agreements with industries for water reuse. NMMC plans to expand its infrastructure by developing additional TTPs, ensuring a more extensive impact on urban water sustainability.

State/UT	Maharashtra
Urban Local Body	Navi Mumbai Municipal Corporation (NMMC)
Department/ Organisation	Navi Mumbai Municipal Corporation, Water Supply and Sewerage Department
Duration	Since 2023

Impact

- Treating and reusing wastewater prevents contamination of water bodies, enhances biodiversity, and improves urban water quality.
- The initiative has also enhanced public health by reducing waterborne diseases and ensuring a cleaner urban environment.
- Supplying treated water to MIDC is expected to generate RS4,940,000,000 in revenue over 15 years, reducing costs associated with pollution control and fresh water supply.

To know more

Contact

Arvind Shinde
Additional City Engineer– Water Supply and Sewerage,
Navi Mumbai Municipal Corporation (NMMC)
addl_ce_civil@nmmc.gov.in

Recycling Waste Water to Recharge Porur Lake: Chennai Paves the Way

State/UT	Tamil Nadu
Urban Local Body	Greater Chennai Corporation
Department/ Organisation	Chennai Metropolitan Water Supply and Sewerage Board
Duration	2019 onwards

Introduction

Chennai in Tamil Nadu, through the efforts of the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) is the first city in the country to effectively process, filter, and recycle its wastewater. In 2019, Chennai set up India's first Tertiary Treatment Reverse Osmosis (TTRO) plants in Kodungaiyur and Koyambedu having a 45 megalitre per day (MLD) capacity that is expandable to 60 MLD. Further, in 2022, a Tertiary Treatment Ultrafiltration Plant (TTUF) to treat and reuse wastewater and recharge local waterbodies at Nesapakkam was additionally set up by the CMWSSB in collaboration with IIT Madras.

Activities

The TTUF plant supplies tertiary treated water to recharge the local Porur lake, which is a crucial source of drinking water for local residents. With a 10 MLD capacity, sewage is processed in the plant through a Sequence Batch Reactor process to remove toxins and bacteria. Subsequently, via a tertiary treatment, finer contaminants are removed to further purify and disinfect the water as one of the key filtration steps necessitated before the water is safe to pour into the aforementioned lake. Water quality is monitored online, tested in local and IIT Madras labs, and assessed through a fish pond for visible changes. The two TTRO plants use 28 km and 6 km pipelines to supply 45 MLD of treated wastewater to 500+ industrial units in Manali and Sriperumbudur corridors.

Integration with Circular Economy

The plants enable the existence of a decentralised closed loop system, generating a sustainable and renewable source of water that replenishes, instead of diminishing natural waterbodies. The process recharges lakes and sustains groundwater levels, while also supplying water to industries and local communities, as required.

Replicability and Scalability

This methodology may be effective in severely drought prone and water-scarce areas across India. Domestic, commercial and industrial wastewater should also be targeted for reuse and recycling within such a model if replicated, to ensure that natural water resources are not depleted.

Impact

- Reduces water pollution through constant filtration and quality checks.
- Improves and replenishes groundwater levels.
- Motivates industries to establish their hubs in Chennai due to greater water security, facilitating economic growth.

To know more

Contact

C. Joyce Sumathi
Superintending Engineer, Wastewater Treatment & Reuse
Greater Chennai Corporation
sewwtr@gmail.com

Ghaziabad's TSTP Project – Advancing Wastewater Reuse for Sustainable Urban Development

Introduction

The Ghaziabad Municipal Corporation has initiated the Indirapuram Tertiary Sewerage Treatment Plant (TSTP). This TSTP enhances water reuse and promotes environmental sustainability while contributing to the national Water+ certification goals. The project, valued at INR 3,194,000,000, supplies treated water to the Sahibabad Industrial Area, reducing reliance on freshwater sources.

Activities

Ghaziabad Nagar Nigam (GNN) pioneered the issuance of India's first certified Green Municipal Bond, securing INR 1,500,000,000 for the project. The Tertiary Sewage Treatment Plant (TSTP), with a 95 km pipeline, delivers 40 MLD of treated water to 1,400 industrial units. The initiative incorporates advanced membrane filtration technologies such as microfiltration, ultrafiltration, nanofiltration, and reverse osmosis to ensure high-quality water treatment. Implemented under a public-private Hybrid Annuity Model (HAM), the project receives 40 percent municipal funding and 60 percent bank financing. GNN has contracted with over 800 firms, including Tata and Bharat Electricals Ltd. (BEL), to supply 9.5 MLD of tertiary treated water, reducing the carbon footprint and enhancing groundwater recharge.

Integration with Circular Economy

The Indirapuram TTP promotes circular economy principles by ensuring wastewater is treated and reused for industrial purposes, minimizing reliance on freshwater sources. The treated water meets potable-grade standards, enhancing sustainable water resource management. Public-private collaboration through the HAM model ensures operational efficiency and long-term sustainability.

Replicability and Scalability

The initiative presents a scalable model for other urban municipalities to upgrade existing sewage treatment facilities with advanced membrane filtration technologies. The success of GNN's Green Bond issuance provides a financial blueprint for similar projects nationwide. State-level policies and incentives for wastewater reuse can further facilitate widespread adoption.

State/UT	Uttar Pradesh
Urban Local Body	Ghaziabad Nagar Nigam
Department/ Organisation	Ghaziabad Nagar Nigam

Impact

- Reduces carbon footprint by minimizing freshwater extraction and untreated sewage discharge. Improves groundwater recharge and curtails greenhouse gas emissions.
- Supports industrial development by providing a reliable alternative water source, stabilizing economic growth and job creation. The high water quality standards are ensured as part of this initiative. This has led to reducing contamination risks and supporting public health initiatives aligned with Water+ certification goals.
- Raised INR 1,500,000,000 through India's first certified Green Municipal Bond, setting a replicable financing model for sustainable infrastructure projects.

To know more

Contact

Vikramaditya Singh Malik, IAS
Municipal Commissioner
Ghaziabad Nagar Nigam
gzb.-nagar.nigam@gmail.com

Rejuvenating Wastewater: Karad Finds A New Resource

State/UT	Maharashtra
Urban Local Body	Karad Municipal Council
Department/ Organisation	Karad Municipal Council
Duration	Since 2018

Introduction

With a growing urban population and increasing pressure on freshwater resources, Karad Municipal Council (KMC) embarked on an initiative to ensure that treated wastewater is effectively reused rather than discharged into water bodies. By implementing advanced treatment technologies, Karad has successfully minimised waste, conserved natural resources, and generated economic value from its wastewater.

Activities

The initiative is anchored in the efficient collection and treatment of wastewater through an extensive 79.12 km sewer network, ensuring 100 percent connectivity to households, commercial establishments, and public facilities. At its core, the city's Sewage Treatment Plant (STP) employs MMBR technology to treat 9 million liters per day (MLD) of wastewater through primary, secondary, and tertiary processes.

A key outcome of this initiative is the complete reuse of treated wastewater. Instead of wasting it, Karad redistributes it for agricultural irrigation, public landscaping and municipal services like street cleaning and dust suppression, and decorative fountains. The project involves Karad Municipal Council, Nature and Care Scientific Solutions Ltd, Pritisangam Co-operative Water Supply Society and local farmers and community members.

Integration with Circular Economy

The reuse of treated water for irrigation reduces dependence on freshwater sources and minimises pollution in natural water bodies. It also lessens the reliance on chemical fertilisers, thereby promoting eco-friendly farming practices.

Replicability and Scalability

Expansion can be achieved by extending the sewer network, upgrading treatment capacities, and integrating smart monitoring technologies such as IoT and AI for real-time data analysis. Strengthening partnerships with the private sector can further optimise water distribution.

Impact

- By preventing untreated wastewater from entering rivers, the project safeguards aquatic ecosystems and biodiversity. The reduction in freshwater extraction mitigates water scarcity, and lower fertiliser dependency minimises chemical runoff into the environment. Additionally, the project reduces greenhouse gas emissions associated with water treatment and distribution.
- The initiative has improved public hygiene and sanitation, leading to better health outcomes. The engagement of local stakeholders fosters community ownership and ensures long-term sustainability.
- The project has reduced municipal expenses related to water procurement and waste disposal. Farmers benefit from free nutrient-rich water, lowering their agricultural input costs and enhancing productivity.

To know more

Contact

Ashish Rokade
City Coordinator, Health Department,
Karad Municipal Council
karadnagarparishad@gmail.com

Promoting Improved Sanitation: Warangal's Circular Economy Approach

Introduction

The Greater Warangal Municipal Corporation (GWMC) has undertaken a critical initiative to establish Faecal Sludge Treatment Plants (FSTPs). As part of the Liquid Waste Management (LWM) component of SBM 2.0, the safe collection, transportation, treatment, and disposal of faecal sludge is emphasised. This initiative thus promotes the sustainable reuse of by-products such as treated water and compost, contributing to better sanitation, reduced contamination, and improved public health.

Activities:

Launched at the Sanitation Resource Park in Ammavaripeta, the initiative currently serves a population of 9,60,000 (as of 2023). Two FSTPs were established, integrating innovative treatment technologies to sustainably address faecal sludge disposal and reuse. The 15KLD Pyrolysis Treatment Plant utilises pyrolysis technology to treat septage by converting sludge in to ash, which is then repurposed as a soil conditioner for agricultural use. The 10KLD Geo-Tube Technology Plant employs a geo-tube system where faecal sludge is deposited into specialised geo-textile bags that allow water to filter through while retaining solid waste. The separated effluent undergoes further treatment, while the dried sludge is processed into fertilizer. This fertilizer is then used in urban nurseries, median plantations, and public parks, reducing reliance on chemical fertilizers and promoting sustainable agricultural practices.

Integration with Circular Economy

The initiative aligns with circular economy principles by focusing on resource recovery and waste minimisation. Faecal sludge is converted into ash and treated water from the FSTPs is repurposed for gardening and landscaping. These efforts close the loop on waste treatment, transforming waste into useful by-products and contributing to environmental sustainability.

Replicability and Scalability

The strategies of innovative treatment technologies, stakeholder engagement, and community involvement, can be replicated in other urban areas facing similar sanitation challenges. This approach is scalable for cities that rely on non-sewered systems or a mix of sanitation systems.

State/UT	Telangana
Urban Local Body	Greater Warangal Municipal Corporation
Department/ Organisation	Commissioner and Director of Municipal Administration
Duration	Since 2018

Impact

- The initiative converts waste into compost and other value-added products, generating revenue through their sale while also reducing costs for ULBs that use these products in urban green spaces.
- Over 8 million litres of faecal waste have been treated, ensuring safer sanitation practices and preventing environmental pollution. The reuse of treated water for urban greenery contributes to water conservation, while the reduction in untreated waste disposal minimises contamination risks.
- The initiative has improved sanitation and hygiene for residents while creating sustainable livelihood opportunities for SHG members involved in plant operations and maintenance.

To know more

Contact

Aswini Tanaji Wakade, IAS
Municipal Commissioner
Greater Warangal Municipal Corporation
commissioner.wmc@gmail.com

Sustainable Sanitation: Promoting Safe FSSM Practices in Telangana

State/UT	Telangana
Urban Local Body	Sircilla Municpality
Department/ Organisation	Sircilla Municpality
Duration	Since 2021

Introduction

Sircilla Municipality has implemented a comprehensive initiative to ensure the sustainable and safe management of faecal sludge. The primary objectives include scheduled desludging of all septic tanks, environmentally sustainable treatment of faecal sludge, promoting hygienic practices, and enhancing community awareness and stakeholder capacity.

Activities

Sircilla's 18 KLD Faecal Sludge Treatment Plant (FSTP), established in 2019, uses biological treatment for sustainable waste management. The municipality introduced scheduled desludging across 39 wards, treating over 1.3 million litres of septage. Private desludging operators were licensed, trained, and equipped with PPE, while capacity-building programs raised public awareness. A robust monitoring system with GPS tracking ensures transparency. Treated sludge is reused in urban nurseries, plantations, and parks, reducing chemical fertilizer use, with 2.2 lakh litres repurposed so far, reinforcing circular economy principles.

Integration with Circular Economy

The initiative follows circular economy principles by transforming faecal sludge into a valuable resource. The biological treatment process converts sludge into compost, which is then utilised in urban green spaces, including nurseries, median plantations, and public parks. This serves as a natural soil conditioner, improving soil quality while reducing dependency on chemical fertilizers. By repurposing waste into useful products, the initiative minimises environmental impact and promotes sustainable urban greening.

Replicability and Scalability

The initiative can be replicated through a structure approach through adoption of scheduled desludging policies, low-maintenance nature-based treatment solutions, and comprehensive capacity-building programmes for stakeholders.

Impact

- Reuse of treated sludge supports resource conservation and reduces reliance on chemical fertilizers. Regular desludging prevents septic tank overflows and mitigates environmental contamination. Biological treatment lowers greenhouse gas emissions compared to traditional waste disposal.
- Enhances community health by reducing waterborne diseases and improving cleanliness. Training programs ensure safe sludge handling, protecting public health.
- Cost savings for urban landscaping by using treated sludge instead of chemical fertilizers.

To know more

Contact

D. Lavanya
Municipal Commissioner
Sircilla Municpality
mcsrcl2007@yahoo.co.in

PUBLIC ENGAGEMENT AND COMMUNITY-BASED INITIATIVES

India's vast waste management initiatives consistently stresses upon the importance of establishing public participation and community-based waste management practices in order to successfully harness and entrench a sense of social responsibility towards waste. The Swachh Bharat Mission (clean India Mission), as the world's largest behaviour change movement, has fostered the nation's sense of collective responsibility towards its waste. Through dedicated capacity building activities, public awareness campaigns, and delivering targeted training in waste management, Urban Local Bodies across India have tapped into the nation's most powerful resource - its people. From the elderly of the country, to its youth, the vision and mission for a Clean India has urged the deliverance of immediate, consistent, and innovative actions across the states. Civilians continue to respond to the clarion call from the Prime Minister for cleanliness, forming localised and informal groups to tackle waste every day.

Patna's Pink Material Recovery Facility: Empowering Women Through Employment

State/UT	Bihar
Urban Local Body	Patna Municipal Corporation
Department/ Organisation	Patna Municipal Corporation
Duration	August 2023 - Ongoing

Introduction

The Pink Material Recovery Facility (MRF) in Patna, established in August 2023, is a pioneering initiative aimed at integrating women into the formal waste management system. Located in Ward 34 of Patna Municipal Corporation, this micro-sized facility has a processing capacity of 2 TPD (tonnes per day) of dry waste. The initiative not only improves waste segregation and recycling efficiency but also empowers women by providing them with stable income opportunities in a sector traditionally dominated by men.

Activities

The Pink MRF is fully operated by women workers who collect, segregate, and channelize various types of dry waste from multiple sources, including door-to-door collections, bulk waste generators (BWGs), ragpickers, and citizen contributions. The segregated recyclables such as plastics, paper, metal, and glass are then sold to large aggregators and recycling industries in Patna. The women workers receive structured training in waste handling, segregation techniques, and workplace safety, ensuring operational efficiency while maintaining a safe work environment.

Integration with Circular Economy

The Pink MRF follows a sustainable circular economy model by enhancing the value chain of dry waste recovery. By effectively sorting and processing recyclable materials, the facility reduces landfill waste, promotes resource recovery, and contributes to the production of secondary raw materials. The initiative fosters an inclusive waste management approach by formally recognizing women's contributions in this sector.

Replicability and Scalability

The Pink MRF serves as a model for other cities aiming to integrate informal waste workers, particularly women, into structured waste management systems. The model can be scaled up across other wards and cities with government and municipal support, leveraging self-help groups (SHGs) and local waste management enterprises.

Impact

- Enhances overall waste segregation efficiency, leading to improved recycling rates and reduced environmental impact.
- Provides economic empowerment by increasing women's earnings by approximately 20 percent compared to their previous informal sector roles.
- Ensures better working conditions, with fixed hours, stable income, and access to social security schemes such as PMJJBY and PMSBY.

To know more

Contact

Mr Dilshad Ahmad
Climate Change Advisor,
GIZ India
dilshad.ahmad@giz.de

The Baini Sena Initiative: Women-Led Waste Management in Uttarakhand

State/UT	Uttarakhand
Urban Local Body	Urban Development Department

Introduction

The Baini Sena initiative, focuses on women's participation in sanitation, waste management, and user charge collection. It empowers women through Self-Help Groups (SHGs) while ensuring efficient solid waste management and improved grievance redressal mechanisms. The initiative strengthens urban sanitation monitoring and revenue generation for Urban Local Bodies (ULBs), aligning with gender equality and sustainable waste management goals. Key stakeholders involved are Nagar Nigam Haldwani, Women Self Help Groups under Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY NULM) programme, Door-to-Door Waste Collection Team and the Community.

Activities

The initiative involves induction training for SHGs on sanitation regulations, user charge collection, documentation, and public relations. SHGs are assigned specific wards for sanitation monitoring, and identity cards are issued for formal recognition. A dedicated control room supports grievance redressal and coordination. Nodal officers, supervisors, and data operators assist in day-to-day operations. The Baini Sena reports waste collection issues and cleanliness levels, supports public awareness campaigns on waste segregation, and enforces bans on single-use plastics.

Integration with Circular Economy

Through this initiative, 85 percent of households are engaged in waste management, improving door-to-door collection services. SHGs ensured 100 percent waste collection from streets and homes. The initiative increases user charge collection, reducing municipal expenses while fostering a self-sustaining waste management system.

Replicability and Scalability

The initiative has been successfully replicated in 15 Urban Local Bodies in Uttarakhand through the convergence of DAY-NULM and Swachh Bharat Mission (SBM) schemes. It can be scaled in urban and rural areas by forming SHGs under the NULM. The model helps improve revenue collection for municipalities while reducing administrative costs.

Impact

- Improved sanitation monitoring and waste management system.
- Ensured cleaner streets, better hygiene, and pollution reduction.
- Increased women participation in sanitation and urban governance.
- Established an effective grievance redressal mechanism.
- Strengthened community awareness and engagement in waste segregation.
- Monthly user charge collection increased from INR 6,00,000 to INR 32,00,000.
- More than 500 women from SHGs employed, earning an average of INR 14,000/month.
- Reduced HR costs for Nagar Nigam in waste management.

To know more

Contact

L.N. Mishra
Additional Director,
Urban Development Department, Rajasthan
directorudd@gmail.com

Promoting Sustainable Travel for All: Haryana Opts for Green Messaging

State/UT	Haryana
Urban Local Body	Municipal Corporation of Panchkula
Department/ Organisation	Municipal Corporation of Panchkula
Duration	1 year

Introduction

The Municipal Corporation of Panchkula in Haryana has implemented a unique social awareness campaign to effectively disseminate information about sustainable travel and eco-friendly waste management practices. Spreading the message of sustainability on wheels, the Municipal Corporation has promoted the good practice of using bicycles as a preferred mode of local travel, reducing greenhouse gas emissions, thus promoting the principles of circularity and encouraging environmentally conscious decision-making within all communities.

Activities

The bicycles are available to rent for a nominal price. Within the duration of the awareness campaign, messages about the importance of source segregation were printed onto the bicycles, to help raise visibility about inculcating good waste management practices into the everyday lives of the citizens.

Integration with Circular Economy

Cycling is an environmentally-friendly mode of transportation. It is often long-lasting, or can be effectively repaired and maintained over a long period of time, releases no toxins or greenhouse gases, and is thereby exceedingly energy efficient. It does not deplete natural resources and therefore supports several circular economy principles. This includes, ensuring eco-friendly product design to ensure product longevity to minimize waste accumulation, emphasising upon product durability and the possibility of its repair, and also ensuring that it is a green mode of transport that exudes a minimal carbon footprint.

Replicability and Scalability

In urban cities, bicycle-sharing modules can be set up and the services be made available at a nominal cost. Sustainable transportation should be encouraged especially for short or medium length distances, perhaps linking key areas in the city. Dedicated bicycle lanes should be constructed, to enable safety and security for all those availing the service.

Impact

- Minimizes the amount of waste created, and sent to landfills or incinerators.
- Minimizes the volume of greenhouse gases emitted.
- Encourages social responsibility and awareness about the importance of opting for eco-friendly modes of transport, while also helping to spread the word about source segregation and effective waste management.

To know more

Contact

Sachin Dhiman
Junior Engineer
Municipal Corporation Panchkula
mcpanchkula@gmail.com

Bags of Change: Chattisgarh Women Tackling Plastic Pollution

Introduction

Ek Kadam is a socially responsible organization dedicated to environmental sustainability and women's empowerment. With a strong focus on waste reduction and skill development, it aims to create employment opportunities while combating plastic pollution. The initiative primarily involves training women in making eco-friendly paper and cloth bags, reducing plastic usage, and promoting sustainable alternatives.

Activities

The initiative follows a structured approach to capacity building and waste management, ensuring active participation from women's self-help groups (SHGs) and community members. Since its launch in December 2016, over 45 SHG women have been empowered through specialized training in paper and cloth bag-making, utilizing discarded newspapers and surplus cloth materials.

Old newspapers are collected and repurposed into paper bags, and materials sourced from Surat's sari factories are repurposed into cloth. For paper bags the women are compensated at a rate of INR 35 per kilogram and for cloth bags based on the weight of bags produced, earning more than Rs. 15,000 individually. These bags are then distributed to various businesses, including hotels, offering an eco-friendly alternative to plastic. Since the initiative's inception, over 1,70,000 paper and cloth bags have been produced and sold, generating a revenue of INR 6,80,000, preventing the use of approximately 20,00,000 plastic bags.

Integration with Circular Economy

The initiative aligns with the principles of a circular economy by emphasizing recycling, reuse, and value-added products. By repurposing discarded materials into usable goods, the initiative minimises waste generation and extends the life cycle of raw materials. The project promotes a zero-waste approach by creating market-driven products that replace harmful plastic alternatives, reducing the ecological footprint.

Replicability and Scalability

Ek Kadam's model can be easily replicated across India and beyond. With minimal investment, training programs, and community participation, similar initiatives can be launched in urban and rural areas.

State/UT	Chhattisgarh
Urban Local Body	Municipal Corporation Rajnandgaon
Department/ Organisation	Ek-Kadam NGO in collaboration with Rajnandgaon Municipal Corporation
Duration	Since 2016

Impact

- The initiative has significantly reduced plastic waste, preventing the usage of millions of plastic bags and promoting eco-friendly alternatives. The reuse of discarded newspapers and fabric materials conserves resources, minimizes landfill waste, and reduces carbon footprints.
- It has empowered women by providing them with financial independence and enhancing their skills in sustainable entrepreneurship.
- The program has generated significant income for SHG women, strengthening their economic stability. The success of the initiative has also attracted additional financial support through advertisements placed on the bags, ensuring long-term sustainability.

To know more

Contact
Mrs. Malay Jain
Founder
Ek-Kadam NGO
jainmalay19@gmail.com

Delhi's Zero-Waste Circular Bank: Engaging Students in Sustainable Waste Management

State/UT	Delhi
Urban Local Body	Municipal Corporation of Delhi
Department/ Organisation	Department of Environment and Management Services
Duration	Since Dec 2020

Introduction

The Zero Waste Circular Solution (ZWC) Bank for Schools initiative promotes student engagement in waste management by encouraging students to deposit recyclable waste—plastic, paper, and e-waste—into a ZWC Bank Account at their schools. Their contributions are digitally tracked, earning environmental points for their contributions. The project fosters awareness, accountability, and environmental stewardship among young learners.

Activities

The initiative has onboarded 45 schools, engaging over 38,000 students in active waste management. In addition to dry waste collection, the program integrates on-campus composting, ensuring that wet waste is converted into manure, further closing the waste loop. The initiative actively involves teachers, school students, NGOs, and zonal officials to create a collaborative and scalable waste management model.

Integration with Circular Economy

Through this initiative over 1,800,557 kg of dry waste has been collected, of which 527,141 kg of plastic waste is diverted for recycling. Wet waste is processed into organic manure, reducing landfill dependency and supporting local green initiatives. The initiative instills long-term waste segregation habits in students, reinforcing sustainability and waste reduction practices.

Replicability and Scalability

MCD aims to expand the Zero-Waste School Program across all municipal schools, ensuring broader adoption of waste segregation and sustainable management practices. This model can be replicated in other urban educational institutions by integrating digital waste tracking, structured collection systems, and behavioral change interventions.

Impact

- Supports national sustainability goals such as Swachh Bharat and Mission LiFE. Reduces plastic waste pollution by integrating efficient collection and recycling systems. It enhances composting efforts, reducing organic waste disposal in landfills.
- Teaches responsibility to students and promotes sustainability by waste segregation and recycling. Encourages innovation by motivating students to find creative waste repurposing solutions.

To know more

Contact

Vandana Rao, IAS
Deputy Commissioner, City SP
Municipal Corporation of Delhi
mcdswachhsurvekshan@gmail.com

Interschool Recycling Championship: Promoting Circular Economy in Delhi

State/UT	Delhi
Urban Local Body	Municipal Corporation of Delhi
Department/ Organisation	New Delhi Municipal Council (NDMC) Public Health Department and E Sree Foundation (ITC WOW Initiative)
Duration	6 month

Introduction

The Reduce, Reuse, and Recycle (Interschool Recycling Championship) encourages students to practice responsible waste disposal, earn rewards, and foster long-term environmental awareness by integrating recycling into their daily routines.

Activities

The program has successfully engaged more than 12,000 students from over 35 NDMC schools, collecting 3,000 kg of dry waste till December 2024. The championship is designed as a waste exchange model, where students deposit dry waste such as paper, plastic, and e-waste in their school's recycling bank in exchange for stationery items like notebooks, pens, erasers, and colors. Students who contribute the most receive certificates, fostering a spirit of environmental stewardship and healthy competition. Additionally, interactive workshops and awareness sessions are conducted to educate students on waste segregation, sustainable waste disposal, and the importance of a circular economy.

Integration with Circular Economy

The initiative promotes a closed-loop system by encouraging waste collection, segregation, and recycling. Used or discarded dry waste is taken to MRF Center from where it is sorted and sent to MRF for further segregation and then to an authorized recycler- M/ S Vishal Paper Mills, Patiala into valuable items, fostering a mindset of reuse and resource optimization. By embedding recycling into student habits, the program aligns with circular economy principles and sustainable consumption practices.

Replicability and Scalability

This model can be replicated across municipal bodies, private schools, and other educational institutions within the NDMC jurisdiction. Partnering with corporate CSR programs to support large-scale recycling initiatives can be another way to scale this, especially by enhancing incentives through additional rewards and recognitions.

Impact

- Reduces waste-related pollution and promotes sustainable waste disposal practices.
- Diverts waste from landfills into recycling streams, optimizing material reuse.
- Reduces municipal waste generation and promotes efficient recycling.

- Encourages student participation in environmental conservation.
- Provides equitable access to essential stationery through recycling incentives.
- Cultivates environmental consciousness among students, teachers, and parents.

To know more

Contact

Dr. Shakuntala Shrivastava
I/C Swachh Survekshan, Public Health Department, NDMC
cmo.project@ndmc.nic.in

Delhi's Zero Waste Colony: A Community-Driven Waste Management Initiative

State/UT	Delhi
Urban Local Body	Municipal Corporation of Delhi (MCD)
Department/ Organisation	Department of Environment Management Services (DEMS)
Duration	Since September 2022

Introduction

The Zero Waste Colony Initiative streamlines municipal solid waste (MSW) management to reduce waste disposal costs, promote decentralized composting, and enhance community participation in sustainable waste management.

Activities

MCD has declared 625 colonies as Zero Waste Colonies, achieving 100 percent waste segregation at source and in-house composting through methods like pit composting, drum composting, aero bins, and organic waste converters (OWC). Waste is classified into wet, dry, sanitary, domestic hazardous, and e-waste categories for efficient processing. The initiative actively involves zonal officials, RWAs, market trade associations, youth groups, and NGOs, fostering a large-scale community-led approach.

Integration with Circular Economy

The initiative integrates with the circular economy through reducing transportation costs and landfill dependency, processing wet waste at the community level to generate compost for local use. Dry waste is directed to recyclers, while residual waste is managed by MCD's authorized agencies. Colonies achieving set benchmarks are classified under Harit Mitra Colonies and Sahbhagita Colonies, with tax incentives and developmental support.

Replicability and Scalability

MCD has set phased targets to expand the Zero Waste Colony model across all zones, focusing on converting RWAs and Group Housing Societies into self-sustaining waste management units. Future expansion includes extending the model to markets, institutions, religious places, and offices to create a city-wide zero-waste framework.

Impact

- Reduces landfill burden and mitigates environmental pollution.
- Promotes composting and recycling, decreasing municipal solid waste generation.
- Encourages proactive community engagement in sustainable waste management.
- Strengthens RWA-led waste reduction models, fostering a cleaner urban environment.
- Reduces municipal expenses on waste collection and transportation.
- Offers property tax rebates to compliant RWAs, incentivizing participation.

To know more

Contact

Vandana Rao, IAS
Deputy Commissioner, City SP
Municipal Corporation of Delhi
mcdswachhsurvekshan@gmail.com

The "Compost Wise" Campaign: Home Composting in Kulgam

State/UT	Jammu & Kashmir
Urban Local Body	Municipal Committee Kulgam
Department/ Organisation	Housing & Urban Development Department
Duration	1 Year

Introduction

The Municipal Council of Kulgam (MC Kulgam) launched a home composting initiative to promote waste reduction at the source. This initiative encourages households to compost their wet waste, minimising landfill dependency and fostering sustainable domestic waste management practices. Through continuous awareness campaigns and community engagement, MC Kulgam has successfully motivated residents to adopt home composting, transforming waste into a valuable resource.

Activities

The initiative began with an intensive outreach program, where MC Kulgam educated residents about the benefits of composting and provided the necessary technical guidance. Initially, a few households adopted home composting, setting an example for others. As success stories were shared, more families joined the initiative, leading to a significant reduction in household waste. The MC continuously supports participants by providing advice about waste segregation, the appropriate size for compost pits, composting techniques, and optimal conditions for waste decomposition. As of now, over 80 households actively compost their wet waste, with a goal to expand participation to 500 households by the end of 2025.

Integration with Circular Economy

The home composting initiative is turning organic waste into nutrient-rich compost, which can be used for gardening and farming. This creates a circular economy in the neighbourhood. The reliance on chemical fertilisers is reduced and decreases the environmental impact of waste disposal. By promoting waste minimisation at the source, the initiative enhances resource efficiency, encourages recycling, and supports sustainable urban living.

Replicability and Scalability

This model can be replicated in smaller Urban Local Bodies (ULBs) where households have access to land for composting. Additionally, the initiative can establish small-scale neighbourhood groups to effectively monitor and manage the program.

Impact

- Waste reduction leads to less air, water, and land pollution. It also helps lower greenhouse gas emissions by reducing production and waste disposal. Additionally, reduced waste contributes to lower pollution levels.
- Minimising waste fosters employment in recycling, upcycling, and sustainability sectors.
- Reducing waste lowers raw material and disposal costs while creating business opportunities through recycling and upcycling. Additionally, minimising waste decreases landfill and incineration expenses.

To know more

Contact

Zahid Sajad,
Chief Executive Officer, JKAS
Municipal Committee Kulgam
eomckulgam@gmail.com

Haritha Karma Sena: Women Recyclers of Kerala

Introduction

The Haritha Karma Sena (HKS) initiative was launched in 2017 as part of the Haritha Keralam Mission to create a sustainable solid waste management system in Kerala. The key stakeholders were Kudumbasree Mission, Suchitwa Mission, Local Self Government Department (LSGD). This program empowers women by involving them in waste collection and segregation at the source.

Activities

The Haritha Karma Sena (HKS) is formed with women from Kudumbashree neighbourhood groups (NHGs). Their key activities include door-to-door collection of waste from households and institutions, ensuring proper segregation at Material Collection Facilities (MCFs), and actively promoting source-level segregation among residents and organizations. To sustain their operations, HKS members collect user fees from households and institutions. The initiative also collaborates with Clean Kerala Company for scientific waste processing, ensuring that collected waste is managed in an environmentally responsible manner. Women are also offered capacity-building sessions facilitated by the Kerala Institute of Local Administration (KILA), equipping members with the necessary skills and knowledge for efficient waste management.

Integration with Circular Economy

HKS members ensure that sorted plastic and other non-organic waste are handed over to the Clean Kerala Company for scientific processing. Proper segregation and recycling practices help reduce the environmental impact of waste disposal, minimizing reliance on landfilling and incineration. Effective waste management conserves natural resources, reduces pollution, and promotes overall environmental sustainability.

Replicability and Scalability

The model is highly replicable in all LSGIs with proper institutional and financial support.

State/UT	Kerala
Urban Local Body	All Local Bodies across Kerala
Department/ Organisation	Kudumbasree
Duration	Since 2017

Impact

- LSGIs cover the formation, training, and operational expenses.
- User fees collected provide a sustainable income source for HKS members. Additionally, the user fees collected from households and institutions are distributed among the group members (HKS) as their remuneration, with a nominal 10 percent deducted to maintain a reserve fund for urgent needs of the group.
- HKS sustains itself on an enterprise model by collecting user fees (fixed by LSGI) for services and carrying out sales of recyclables, inoculum, sales and services of composting devices among others.

To know more

Contact

Mr. Gokul Prasannan
PMU Kerala, IEC Expert-PMU
sanitationkerala@gmail.com

Odisha's Decentralised Waste Management: An Apparatus for Community Engagement

State/UT	Odisha
Urban Local Body	All (state-wide initiative)
Department/ Organisation	Housing and Urban Development Department, Odisha
Duration	Since 2020

Introduction

Odisha has implemented a community-led decentralised municipal solid waste management model across the state, emphasising the need for community-driven, collaborative solutions for the successful collection, segregation, processing, disposal and recycling of municipal waste. The framework prioritises community participation and local engagement to boost effective urban waste management, within a standardised directive developed by the state for all Urban Local Bodies (ULBs) to follow.

Activities

By collaborating with Swachh Sathis and SHGs, local communities were effectively engaged via extensive behavioural change and awareness campaigns to build a sense of collective responsibility towards the end-to-end management of municipal solid waste. Employment opportunities were created by various ULBs who trained community partners in all matters of solid waste management.

100 percent door-to-door waste collection from domestic, industrial, and commercial waste generating units was implemented across Odisha, with the collected waste being transported in custom-made, partitioned Vehicles. While wet waste is converted to compost, dry waste is segregated into recyclable and non-recyclable fractions, with the latter transported to cement plants for co-processing. Reduce, Reuse, Recycle (RRR) centres have also been established.

Integration with Circular Economy

Odisha's decentralised waste management framework adheres to the principles of circular economy for endeavouring to establish networks of resource recovery and recycling wherever possible.

Replicability and Scalability

Through community engagement,Odisha's decentralised waste management can be replicated across other cities to create a financially and environmentally sustainable urban waste management system.

Impact

- Approximately 1,155 tonnes per day of wet waste and 1,102 tonnes per day of dry waste are collected every day across the 115 ULBs. The decentralised processes have minimized the volume of waste dumped in landfills, reduced transportation costs and distances, thereby reducing the individual carbon footprints of the cities.
- A citizen-centric and cost-effective model, the initiative has so-far created employment opportunities for 3,160 Mission Shakti Groups, 3,395 Swachh Karmis, 2,172 Swachh Sathis, 468 Swachh Supervisors, 136 members from the transgender community, and 764 informal waste pickers.
- The effective segregation and sale of recyclable materials has generated a revenue of INR 2.76 crores by the end of 2024.

To know more

Contact

Sri Rajesh Prabhakar Patil, IAS
Special Secretary to Government and State Mission Director, SBM (Urban), Odisha
sanitationhud@gmail.com

INNOVATIVE INTERVENTIONS

Several states across India have risen boldly to the challenge of having to deal with accumulating levels of waste over the years by tapping into creative and innovative avenues to reimagine effective, circular systems for urban waste management. With the rise in urgency for sustainable solutions across the world, India has been thinking outside the box to yield collaborative, efficient, environment-friendly, and long-term results that make the maximum amount of beneficial contributions to existing waste management systems. Engaging new technologies and processes, Urban Local Bodies across the states have been busy ideating, implementing and forging new pathways - paving the way for others to likewise conceive, carry out, and clean.

The Journey of Old Clothes: Navi Mumbai is Giving Textile Waste a New Life

Introduction

The rising volume of post-consumer textile waste (PCTW) is a growing environmental concern. To address this, the Navi Mumbai Municipal Corporation (NMMC) has launched an initiative focused on reducing textile waste.

Activities

NMMC has launched a textile waste management program with multiple stakeholders. Awareness programs educate citizens, industries, and institutions on responsible disposal and recycling. Collection points are set up across housing societies, offices, schools, and colleges, with SBI Foundation Ltd. providing bins. Door-to-door collection drives, in collaboration with municipal services, ensure efficient waste gathering. A dedicated logistics system transports waste to the Textile Recovery Facility (TRF), where advanced sorting technologies enhance segregation. Upcycling units at TRF convert waste into new products, collaborating with artisans and designers.

NMMC has developed market linkages through retail, online platforms, and trade shows. Public engagement campaigns, encourage community participation in sustainable textile waste management. The project will be made successful with a combined efforts of Textiles Committee (TC), SBI Foundation Ltd., IDH India Hub Pvt. Ltd., Tisser Artisan Trust, Local communities, housing societies, schools, colleges, and NGOs.

Integration with Circular Economy

By systematically collecting, processing, and reintegrating textile waste into the economy, the initiative follows circular economy principles. Initial targets include collecting 10-12 MT of PCTW monthly, scaling up to manage the city's full 40-45 MT daily generation. By installing 200 collection bins across societies, the initiative will serve over 11,000 families in its first year. It supported livelihoods of approximately 1,500 families.

Replicability and Scalability

The initiative can be scaled by increasing community participation and developing market linkages.

State/UT	Maharashtra
Urban Local Body	Navi Mumbai Municipal Corporation (NMMC)
Department/ Organisation	Solid Waste Management Department, Navi Mumbai Municipal Corporation (NMMC)
Duration	Since 2024

Impact

- Recycling and upcycling textiles significantly reduce the demand for virgin materials, conserving energy and reducing greenhouse gas emissions. Recycling textiles cuts energy use by up to 70 percent, mitigates landfill waste, and decreases water pollution.
- Engaging communities in sustainable practices fosters environmental responsibility, while collaboration with artisans preserves traditional skills and creates economic opportunities through market linkages.

To know more

Contact

Santosh Warule
Deputy Municipal Commissioner,
Solid Waste Management Department,
Navi Mumbai Municipal Corporation (NMMC)
dmc_swm@nmmc.gov.in

Promoting Sustainable Vehicle Disposal: Gujarat's End-of-Life Vehicle Plan

State/UT	Gujarat
Department/ Organisation	Ministry of Road Transport & Highways
Duration	Since 2021

Introduction

Gujarat has implemented the Transport and Highways Policy on Registration and Functions of Vehicle Scrapping Facility (2021) to promote sustainable vehicle disposal. To encourage scrapping, Gujarat offers motor vehicle tax concessions, waivers on old vehicle dues, and additional benefits for electric vehicle purchases, ensuring a cleaner and more efficient transport ecosystem.

Activities

Gujarat has established five Regional Vehicle Scrapping Facilities (RVSF) with an annual capacity of scrapping 3,00,000 vehicles. Investors can apply online through the National Single Window System, linked to the IFP Portal for state approvals. Tax concessions are provided for new vehicle purchases when an old vehicle is scrapped at an RVSF, along with a one-time waiver for tax, penalties, and e-challans on vehicles over eight years old. The PUC system is integrated with the VAHAN portal to identify end-of-life vehicles (ELVs), while Automated Testing Stations (ATS) ensure proper testing. Owners receive a Certificate of Deposit (COD) for tax benefits, and additional incentives, including tax concessions and subsidies, are provided for electric vehicle purchases.

Integration with Circular Economy

Gujarat's vehicle scrapping policy aligns with the principles of a circular economy by promoting resource recovery and sustainable waste management. Through RVS, the state processes end-of-life vehicles (ELVs), ensuring material reuse and reducing environmental impact. Incentives like tax concessions and registration fee waivers encourage the adoption of eco-friendly vehicles, fostering a circular approach to mobility and resource efficiency.

Replicability and Scalability

Gujarat's vehicle scrapping model can be replicated nationwide by integrating the National Single Window System for investor approvals and linking VAHAN with PUC checks. Scalability is ensured through incentives like tax concessions, COD benefits, and EV subsidies. Expanding Automated Testing Stations (ATS) and RVSFs across states can accelerate old vehicle disposal, promoting cleaner transportation.

Impact

- Integrated PUC checking system and Automated Testing Stations (ATS) enhances monitoring of end-of-life vehicles (ELV).
- Streamlines regulatory approvals, making it easier for investors to set up scrapping centers.
- Boosts employment opportunities in the vehicle scrapping and recycling sector.

To know more

Contact

Ministry of Road Transport & Highways
helpdesk-vahan@gov.in

Double Chambered Incinerator: Treating Sanitary Waste in Thrissur

State/UT	Kerala
Urban Local Body	Thrissur Municipal Corporation
Department/ Organisation	Thrissur Municipal Corporation
Duration	Lifetime

Introduction

A double-chambered sanitary incinerator provides an efficient and hygienic solution for the disposal of sanitary waste. It ensures complete combustion while minimizing environmental pollution and health risks. The incinerator operates through two chambers: the primary chamber initiates waste combustion, while the secondary chamber ensures high-temperature burning of residual gases and odor control. This technology supports waste volume reduction and hygienic disposal, making it a crucial component of sustainable waste management systems.

Activities

The sanitary incinerator functions through a systematic process involving the primary chamber, where waste is loaded, ignited at a moderate temperature, and reduced to ash. The secondary chamber then processes the gases and smoke, subjecting them to high temperatures above 800°C to ensure complete breakdown of organic matter, odor elimination, and pollutant reduction. This process significantly reduces waste volume, ensures hygienic disposal, minimizes environmental impact, and collects ash for safe disposal.

Integration with Circular Economy

To align with circular economy principles, sanitary incinerators can incorporate waste segregation and pre-treatment by encouraging proper segregation at the source to separate recyclable materials from incinerable waste. Resource recovery can be explored by utilizing residual ash in construction materials. Integrating emission control technologies can minimize air pollutants.

Replicability and Scalability

Improper waste disposal showcase the growing demand for hygienic and environmentally safe disposal methods in schools, hospitals, and public places. Government policies and regulatory frameworks with public-private partnerships facilitate cost-sharing and technology dissemination.

Impact

- Reduction in waste accumulation and uncontrolled dumping.
- Minimization of greenhouse gas emissions through controlled combustion, thus preventing air and water pollution.
- Improved hygiene and health, particularly for women and girls, by ensuring proper disposal of sanitary waste.
- Enhanced dignity and privacy by providing a discreet disposal method.
- Reduced waste management costs for Urban Local Bodies (ULBs).
- A cost-effective waste disposal solution compared to alternative methods.

To know more

Contact

Abdul Nasar
Manager, Clean City
Thrissur Municipal Corporation
swmtcr@gmail.com

Solar Powered Cleanup: Leh's Bright Solution to Waste

Introduction

Leh, a prominent tourist destination in the Union Territory of Ladakh, faces significant challenges in managing solid waste due to increasing visitor footfall and limited waste disposal infrastructure. In response, a solar-powered solid waste management initiative was launched to address the pressing environmental concerns associated with waste accumulation.

Activities

With the support of the Ladakh Autonomous Hill Development Council (LAHDC), a solid waste management plant with a processing capacity of 30 tonnes per day (TPD) was established. The facility is powered by solar energy, reducing dependency on conventional power sources, thereby lowering operational costs. A key objective of the project is to achieve 100 percent source segregation of waste and a 90 percent material recovery rate, ensuring that most of the waste collected is either recycled or composted rather than ending up in landfills.

Prior to the intervention, Leh suffered from inadequate waste collection practices, leading to waste overflow in public spaces and increased health hazards. The new system significantly improves waste collection efficiency, contributing to a cleaner environment. The initiative generates revenue by selling recyclable materials and compost, making the project financially sustainable.

Integration with Circular Economy

The project follows a circular economy approach by focusing on recycling, reuse, and value addition. Waste is repurposed into useful products such as pavement tiles and compost, which are reintegrated into the local economy. With a 90 percent material recovery rate, the initiative ensures that a minimal amount of waste is sent to landfills, thereby reducing environmental pollution and supporting long-term sustainability.

Replicability and Scalability

This initiative can be scaled in other hilly and tourist regions facing similar waste management challenges. Given the abundance of sunlight in such areas, solar-powered waste processing plants can be implemented effectively, reducing reliance on conventional energy sources.

State/UT	Ladakh
Urban Local Body	Leh
Department/ Organisation	Directorate of Urban Local Bodies, Ladakh
Duration	Initiated in 2020 with the establishment of the solar-powered waste management plant. The plant is operational successfully since then.

Impact

- Minimising waste accumulation in landfills.
- The use of solar energy further supports sustainability by lowering carbon emissions and operational costs, and also ensures reliable operations even in remote, off-grid areas.
- Improved public health and sanitation as waste overflow in public areas has been reduced.
- Proper waste segregation and treatment reduce health risks associated with unmanaged waste.
- Financially, the revenue generated from recyclables and compost supports the ongoing functioning of the plant, making it a self-sustaining model.

To know more

Contact

Moses Kunzang, Stanzin Rabgais
Director Urban Local Bodies, Ladakh; Executive officer, Municipal Committee, Leh
dulbladakh@gmail.com

Healing the Planet: Thane's Green Pharmacy

Introduction

Improper disposal of household medicines leads to environmental contamination, antimicrobial resistance, and health hazards. To mitigate these risks, Thane Municipal Corporation (TMC) in collaboration with Rnisarg Foundation have launched an initiative focused on safe medicine consumption and disposal through public awareness and dedicated take-back bins.

Activities

The initiative emphasises public education on safe pharmaceutical practices through physical and digital awareness campaigns, including workshops, webinars, social media videos, and informational flyers. Specially designed take-back Green Pharmacy bins have been installed at key locations such as residential societies, schools, chemists, and hospitals across Thane City, with 27 bins currently in operation and plans for expansion.

A structured collection process ensures that pharmaceutical waste is gathered monthly, audited for proper segregation, and sent for scientific disposal. Active Pharmaceutical Ingredients (APIs) are treated through environmentally safe disposal methods, while recyclable packaging is directed towards recycling streams, and non-recyclable waste is sent for co-processing. Stakeholders involved include Rnisarg Foundation, Thane Municipal Corporation, Citizens, Mumbai Waste Management, Recyclers, and Local NGOs. Over three years, the project has already diverted two tons of household pharmaceutical waste from landfills.

Integration with Circular Economy

The initiative integrates circular economy principles by segregating and recycling medicine, packaging waste, ensuring resource recovery while maintaining safe handling practices. By diverting household pharmaceutical waste from landfills, the project reduces environmental contamination and contributes to waste minimisation.

Replicability and Scalability

Expanding the network of pharmacy bins to every housing society and hospital will significantly scale up the initiative. Collaborations with citizen groups, medical colleges, and policymakers will further amplify the impact, while support from regulatory bodies like TMC and the Maharashtra Pollution Control Board (MPCB) will drive large-scale awareness and policy adoption.

State/UT	Maharashtra
Urban Local Body	Thane Municipal Corporation
Department/ Organisation	Solid Waste Management Department, Thane Municipal Corporation (TMC)
Duration	Since 2021

Impact

- Environmentally, the project prevents pharmaceutical contamination in soil and water, preserving biodiversity and reducing ecological harm. Health and safety benefits include reducing risks of antimicrobial drug resistance, accidental ingestion, misuse, and exposure to hazardous substances.
- Socially, it enhances public awareness of safe medicine use and disposal, protecting communities from health hazards associated with expired or unused drugs.
- Financially, the initiative reduces costs associated with improper pharmaceutical waste disposal and mitigates financial losses linked to environmental contamination.

To know more

Contact

Dr. Rani Shinde
Health Officer, Nodal Officer for SBM(U),
SWM Department,
Thane Municipal Corporation
hoswm@thanecity.gov.in

Rajasthan's Pyrolysis Push: Transforming Tyres to Renewable Energy

Introduction

Hi Green Carbon Limited has pioneered a sustainable waste tyre recycling initiative in Rajasthan by implementing a state-of-the-art pyrolysis process unit. This initiative aims to curb the incineration of waste tyres in the unorganised sector while promoting a circular economy. By producing green fuel and recycled carbon black, the project reduces dependency on fossil fuels, enhances energy efficiency, and significantly cuts greenhouse gas emissions.

Activities

The initiative operates a continuous waste tyre pyrolysis plant with a 100 TPD capacity, processing 1.5 million waste tyres over the past 12 years. The plant has produced 60,000 metric tons of green fuel and 50,000 metric tons of green carbon while ensuring zero liquid or solid waste discharge. The process achieves a 90 percent reduction in CO_2 emissions compared to virgin carbon production and a 93 percent reduction compared to tyre incineration. The project adheres to environmental guidelines set by the Rajasthan State Pollution Control Board, Central Pollution Control Board, and MoEF&CC. It collaborates with industries such as rubber, tyre, plastics, cement, and steel, creating a sustainable supply chain for waste-derived resources.

Integration with Circular Economy

The initiative embodies waste-to-wealth principles by transforming discarded tyres into valuable industrial inputs, reducing reliance on imported fossil fuels. By replacing furnace oil and heavy thermal oil with green fuel, it contributes to sustainable industrial practices. Energy efficiency is maximized through waste heat recovery, solar power generation, and water recycling via an in-house effluent treatment plant. The project is ISO-certified for environmental, occupational safety, and quality management, as well as ISCC Plus certified for international sustainability and carbon certification.

Replicability and Scalability

The project demonstrates scalability potential through policy-level interventions, industry incentives, and infrastructure expansion near waste tyre generation hubs. Standardized waste management policies can streamline operations, while restrictions on unregulated tyre disposal can enhance compliance.

State/UT	Rajasthan
Urban Local Body	Rajasthan Pollution Control Board
Department/ Organisation	Hi Green Carbon Limited
Duration	Ongoing for 12 years

Impact

- The initiative eliminates landfill disposal and tyre incineration, significantly reducing GHG emissions. It optimizes energy efficiency through solar power and waste heat utilization, conserves water via recycling, and improves air quality by preventing hazardous emissions.
- By reducing industrial reliance on fossil fuels and substituting virgin carbon with recycled carbon black, the project lowers operational costs for industries. It also generates employment in waste collection, transportation, and processing, contributing to economic growth.

To know more

Contact

Amit Bhalodi & Nirmal Sutaria
Director
amit@radhegroup.com

The Black Soldier Fly: Mangalore's Composting Technology

State/UT	Karnataka
Urban Local Body	Mangalore City Corporation
Department/ Organisation	Mangalore City Corporation
Duration	Ongoing

Introduction

The Mangalore City Corporation has launched an innovative and organic methodology, called the Black Soldier Fly (BSF). BSF has been deployed in the city after the conclusion of its successful pilot run, to convert wet waste into nutrient-rich, organic manure. With the generation of several hundreds of tonnes of municipal wet waste from household and bulk waste generators across the city per day, the urgency to introduce and cement a successful waste management process is paramount.

Activities

The BSF is an eco-friendly process, and a more environmentally viable alternative to vermicomposting and windrow composting methods. The latter is an often time consuming process, with other associated undesirable outputs such as the production of malodour and leachate during compost generation.

Black soldier flies feed upon organic waste material to grow and lay their eggs. The process therefore allows them to breed and produce compost, while simultaneously addressing the issue of accumulated wet waste. The process does not attract house flies or other pests, does not release any odour, and does not produce leachate. Nutrient rich manure is generated within a duration of 12 days to a month; this is used as a natural fertilizer and can be employed extensively in horticulture, agriculture, as well as gardening activities.

Integration with Circular Economy

By converting waste into valuable, eco-friendly resources, the BSF technology utilised in Mangalore to tackle the problems of wet waste has created the capacity for a zero-waste, circular economy to entrench itself within the city's waste management strategy. This is a completely organic process that yields rich resources that are beneficial to the environment.

Replicability and Scalability

While efforts will have to be taken to effectively introduce and seamlessly integrate the BSF technology into a city's municipal solid and liquid waste management scheme, cities may look to Mangalore to study the importance of adopting innovative and cutting edge technologies to address community challenges and help local ecosystems.

Impact

- An environmentally friendly process with no undesirable byproducts, and the compost developed is a natural fertiliser that is extremely beneficial for soil health and fertility.
- It has helped introduce the community to the concept of source segregation, to help them better understand the importance of being able to identify and segregate their wet and dry waste components.
- The compost produced by the process has been valued at around INR 6 to 8, and can be sold at a profit.

To know more

Contact

Sri Ravichandra Naik
Commissioner
Manglore City Corporation
commissioner.mcc@gmail.com

Smart Waste Management: How Lucknow is Leading in Carcass Recycling

Introduction

A Modern Carcass Utilization Plant is established in Lucknow. The initiative aims to create an organized and scientific system for the disposal of dead animals, reduce pollution and environmental hazards, and generate additional revenue for the local body through plant operations. Lucknow Municipal Corporation is the project implementation agency. M/s. J.D. Engineering is the turnkey contractor, and operation and maintenance is the responsibility of M/s. Eagle Agro Feeds.

Activities

The Plant operates through several key sections, it begins with the receiving and inspection area, where dead animals are collected and examined. At a separate skin separation area, hides and skins are removed for further use. In the carcass processing area, the remaining parts undergo further treatment to extract valuable by-products. The Meat and Bone Meal (MBM) production and collection area is dedicated to producing MBM, while the tallow collection area focuses on extracting and storing tallow. An Effluent Treatment Plant (ETP) area ensures the proper treatment of wastewater generated during processing. The carcasses are then crushed in the pre-breaking stage before undergoing a cooking process to break them down further. Fat or tallow extraction is carried out using hydraulic presses, after which the material is dehydrated in a drying and cooling phase. Finally, the dried material is ground into MBM using a hammer mill, while waste steam and untreated water are treated in the ETP, ensuring environmentally responsible operations.

Integration with Circular Economy

The plant processes dead animals collected from municipal areas to produce commercially viable by-products such as MBM and tallow, promoting sustainable waste management and generating revenue.

Replicability and Scalability

Similar plants are successfully operating in Jaipur and Jodhpur in Rajasthan and Lucknow and Kanpur in Uttar Pradesh, demonstrating their technical, environmental, and commercial viability. Municipal corporations across the country are encouraged to implement similar plants for effective animal waste management.

State/UT	Uttar Pradesh
Urban Local Body	Lucknow Municipal Corporation
Department/ Organisation	Lucknow Municipal Corporation
Duration	12 Months

Impact

- Incentivizes proper disposal of dead animals, enhancing rural income and improving city cleanliness.
- Reduces pollution and environmental hazards, prevents the spread of diseases associated with decomposing carcasses, and maintains a cleaner urban environment.
- A total of 14,126 dead animals were processed at the plant, resulting in the production of 197.76 tons of Meat and Bone Meal (MBM) and 16.95 tons of tallow. Additionally, the plant generated an annual royalty of Rs. 25.00 lakh for the Lucknow Municipal Corporation (LMC).

To know more

Contact

Mr. Aloke Karan
Managing Partner
Lucknow Municipal Corporation
karanaloke@gmail.com

Innovative Circularity in Ghaziabad: Transforming Waste Through Sustainable Practices

State/UT	Uttar Pradesh
Urban Local Body	Ghaziabad Municipal Corporation
Department/ Organisation	Ghaziabad Nagar Nigam

Introduction

Ghaziabad Municipal Corporation has undertaken a multi-faceted approach to urban sustainability by integrating sanitation, waste management innovation, and resource recovery. The Corporation has implemented an integrated approach to the circular economy through three key initiatives: the Pink Bus Toilet, Swachhta Lab, and Reduce, Reuse, Recycle (RRR) Centre.

Activities

The Pink Bus Toilet, a refurbished bus converted to a toilet,, ensures safe and hygienic sanitation facilities for women in public spaces, featuring mobile units with water-saving fixtures and regular maintenance. The Swachhta Lab serves as a waste management innovation hub, promoting research, hands-on training, and sustainable waste-to-value solutions. Complementing these efforts, the RRR Centre facilitates responsible waste disposal by collecting reusable items like clothes, books, and electronics for refurbishment and redistribution. Together, these initiatives enhance urban sustainability, promote resource efficiency, and engage the community in circular economy practices.

Integration with Circular Economy

By utilising recycled materials in infrastructure and waste processing, these initiatives promote waste reduction, reuse, and recycling principles. Sustainable water management is ensured through water-efficient fixtures, reducing resource consumption. Additionally, community-driven waste-to-value solutions are developed to enhance environmental sustainability, encourage responsible waste disposal, and create economic opportunities.

Replicability and Scalability

The model is adaptable across urban centres due to its modular implementation and strong public-private collaboration. Expansion can be achieved by deploying additional Pink Bus Toilets in high-footfall areas, establishing more Swachhta Labs within educational institutions and waste facilities.

Impact

- Reduction in landfill waste, conservation of water, and enhanced recycling efforts.
- Improved sanitation access for women, increased public awareness, and better community engagement in waste management.
- Cost-effective waste management, revenue generation through recycling initiatives, and job creation in sanitation and waste processing sectors.

To know more

Contact

Vikram Adithya Singh Malik
Municipal Commissioner
Ghaziabad Nagar Nigam
gzb.nagar.nigam@gmail.com

Introducing 'Swachhta Ambulance': Meerut's Efficient Waste Management

State/UT	Uttar Pradesh
Urban Local Body	Meerut Municipal Corporation
Department/ Organisation	Meerut Municipal Corporation
Duration	Since December 13, 2024

Introduction

On December 13, 2024, the Meerut Municipal Corporation, in alignment with the Swachh Bharat Mission, introduced the Swachhta Ambulance initiative. This innovative solution addresses improper waste disposal, especially during the wedding season, which generates significant waste. The initiative ensures efficient waste management while promoting sustainability and community participation.

Activities

The Swachhta Ambulance initiative involves the deployment of mobile waste collection units that efficiently collect and transport waste from wedding venues and large gatherings. A 24/7 toll-free helpline (18002100351) enables citizens to easily request waste collection services, ensuring prompt and hassle-free disposal. Sustainable waste management practices such as segregation, composting, and recycling are integral to the initiative, reducing landfill burden. The initiative actively engages the community through awareness campaigns, promoting responsible waste disposal and encouraging citizen participation in maintaining cleanliness.

Integration with Circular Economy

The initiative fosters a circular waste management system by promoting sustainable waste disposal methods. Waste collected is sorted for recycling and composting, reducing landfill burden and conserving natural resources. The initiative encourages citizen participation in waste reduction, reuse, and responsible disposal.

Replicability and Scalability

The initiative can be adapted in urban areas across India due to its flexible and demand-based implementation model. Expansion can be achieved by increasing the fleet of Swachhta Ambulances to cover more areas, establishing waste management tie-ups with event organisers and local authorities, and enhancing public awareness campaigns to encourage broader participation in responsible waste disposal.

Impact

- Reduces landfill waste, promotes composting, and supports sustainable waste processing.
- Enhances cleanliness, hygiene, and public health in event spaces and residential areas.
- Reduces municipal waste management costs by improving waste collection efficiency and promoting recycling-based revenue streams.

To know more

Contact

Saurabh Gangwar, IAS
Municipal Commissioner
Meerut Nagar Nigam
nnmee@nic.in

Bio-Enzymes for People, Planet and Profits: Innovation in Orohalli

Introduction

Orohalli Gram Panchayat in Karnataka is driving a women-led SHG initiative of producing bio-enzymes from citrus peels as an eco-friendly alternative to chemical cleaners. The drive addresses waste management, generating income, and promoting sustainability in 11 villages of the Panchayat. The success of this model highlights its scalability for other regions. Government interest in procuring bio-enzymes for office use further strengthens its potential as a sustainable, women-led enterprise promoting a green local economy.

Activities

In 32 months, 600 litres of bio-enzyme has been produced from local citrus peels, of which 280 litres has been sold. The initiative has empowered 12 women, and they earned additional income of Rs. 20 per litre. The beneficiaries of this initiative are training other SHGs thus leading to a snowball effect.

Integration with Circular Economy

The drive has helped in managing citrus peels, that are difficult to compost. Around 315 Kgs of citrus peels have been used in production of bio-enzyme which is supplied to surrounding areas thus minimising transportation related GHG and also generating local jobs.

Replicability and Scalability

The bio-enzyme production model can be replicated in other regions facing similar solid waste and livelihood challenges. Self-help groups (SHGs) or community groups can adopt this sustainable practice, promoting local economies and environmental well being. SHGs involved in waste collection and management, in particular, can be incentivized through such initiatives that also empower communities to embrace eco-friendly practices while creating additional livelihood opportunities.

State/UT	Karnataka
Gram Panchayat	Orohalli
Department/ Organisation	Department of Drinking Water & Sanitation
Duration	4 years

Impact

- The bio enzyme is sold in reused PET bottles thus preventing single use plastic packaging items getting burnt.
- As the women are producing and selling their own produce it creates an example on women entrepreneurship, fostering economic resilience among them.

To know more

Contact

Shilpa D R
Pradhan
Orohalli Gram Panchayat
pdohk.orahalli@gmail.com

THE MINISTRY OF FOOD PROCESSING INDUSTRIES

The Ministry of Food Processing IndustrieS (MoFPI) has been instrumental in promoting the 'Waste to Wealth' initiative within India's food processing sector, in alignment with the principles of a circular economy. Recognizing the potential of transforming food waste into valuable resources, MoFPI has launched several schemes to reduce waste and enhance resource efficiency. The Pradhan Mantri Kisan SAMPADA Yojana (PMKSY), for example, enhances infrastructure to reduce post-harvest losses. The Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PMFME) supports micro food processing units with financial and technical aid, promoting the 'One District One Product' approach. The Production Linked Incentive Scheme for Food Processing Industries (PLISFPI) incentivizes the manufacturing of food products from waste, fostering innovation, economic growth, and sustainability. Through these initiatives, MoFPI addresses environmental concerns while promoting economic growth, creating employment opportunities, and supporting sustainable practices in the food processing industry.

Sustainable Alternative to Single-Use Plastics

State/UT	Karnataka & MP
Urban Local Body	Bruhat Bengaluru Mahanagara Palike & Bhopal Municipal Corporation
Department/ Organisation	Ball Corporation

Introduction

Ball Corporation promotes the 3Rs and circular economy by advocating Aluminum beverage cans as a sustainable alternative to single-use plastics. Aluminium is infinitely recyclable, and 75 percent of all aluminium ever produced is still in use today. Their closed-loop recycling process enables used cans to return to store shelves as new cans quickly, reducing waste and energy consumption. Recycling aluminium significantly lowers the energy required for production, and unlike other materials, it retains its quality through multiple recycling cycles. Additionally, aluminium cans have a lower global warming potential compared to PET and glass packaging, making them an environmentally superior choice. By integrating these practices, Ball Corporation contributes to resource efficiency, waste reduction, and a more sustainable packaging ecosystem.

Activities

Two pilot projects for the collection of Used Beverage Cans for recycling were initiated jointly with Waste Management companies where around 5000 safai karmacharies were involved.

Integration with Circular Economy

The purpose of the initiative was to recycle the Used Beverage Cans for making beverage cans which would help in reducing the energy by 95 percent.

Replicability and Scalability

Ball Corporation's closed-loop recycling model for aluminum cans demonstrates its replicability, due to its efficient collection and recycling processes, which can be adapted across regions to enhance resource efficiency, reduce waste, and integrate with circular economy initiatives.

Impact

- Since the collection of Used Beverage Cans was not done in the organised sector, through these pilot projects Ball could showcase that waste management companies, brand owners of beverage companies and safai karmacharies could come under one umbrella. This initiative has also helped to improve the livelihood of safai karmacharies.

To know more

Contact

K S Ganesan
Head - Corp Affairs
Ball Corporation
ks.ganesan@ball.com

Integrating Circular Solutions: Tetra Pak's Sustainability Journey

State/UT	Pan-India
Department/ Organisation	Tetra Pak India Pvt. Ltd.

Introduction

Tetra Pak has been operational in India for 37 years, offering food processing, packaging, technical services, recipe formulation, marketing services, and sustainability solutions to over 400 leading F&B companies.

Activities

Tetra Pak demonstrates the 3Rs through innovative practices across its value chain. To reduce environmental impact, the company replaces traditional materials with plant-based caps, tethered caps, and paper straws sourced from FSC-certified paperboard. Tetra Pak further demonstrates a closed-loop system via partnerships such as the Sabarkantha Dairy project, where post-consumer cartons are transformed into durable roofing sheets. Recycled materials are repurposed into furniture, stationery, pallets, and even 3-wheeler auto seats, showcased through interactive exhibits that educate visitors on recycling efforts. Emphasizing reuse, the company highlights creative applications like constructing cowsheds from recycled packaging.

Integration with Circular Economy

By integrating these strategies—from sustainable sourcing to end-product innovation—Tetra Pak advances circularity, ensuring materials remain in use. This aligns with their mission to "protect what's good".

Replicability and Scalability

In India, Tetra Pak is the first paper-based beverage carton manufacturer that is geared to start manufacturing packaging material with a minimum of 5 percent recycled plastic content starting April 2025, as part of its obligations under the Plastic Waste Management Rules of the Ministry of Environment, Forest and Climate Change.

Impact

- In India, Tetra Pak has been voluntarily executing EPR for close to 20 years, investing around INR 750,000,000 during this time. Tetra Pak operates with a network of over 30 collection partners pan-India, five key aggregator groups, and nine recycling facilities.
- Tetra Pak supports consumer awareness programmes on used beverage cartons like Alag Karo, Go Green with Tetra Pak, Cartons to Classroom.
- In 2023, Tetra Pak sold 10.4 billion plant-based packages and 12.6 billion plant-based caps, made from segregated plant-based polymers, traceable to their sugarcane origins.
- Globally, Tetra Pak is spending approximately €100 million annually in packaging research and development.

To know more

Contact

Deepten Chatterjee
Head of Corporate Affairs, South Asia,
Tetra Pak
deepten.chatterjee@tetrapak.com

Advanced Recycling and Sustainable Packing Innovations

State/UT	Uttar Pradesh
Urban Local Body	Noida Authority
Department/ Organisation	UFlex Limited

Introduction

Sustainability is embedded at the heart of UFlex's operations, driving the company to innovate responsibly and create packaging solutions that serve both the business and the environment. As a global leader in flexible packaging, UFlex recognizes its pivotal role in shaping a circular economy and reducing the ecological footprint of the packaging industry.

Activities

UFlex's sustainability initiatives are extensive and feature a variety of advanced projects and products, such as extensively recycling mixed plastic waste and promoting the use of recycled material, tackling plastic waste through the strategic adoption of advanced technologies. UFlex's global sustainability initiative, 'Project Plastic Fix', is designed to develop solutions that keep plastic in the economy and out of the environment.

Integration with Circular Economy

UFlex manages plastic waste through its 4R approach: Reduce plastic at source by manufacturing and using films made from PCR; Recycle via upcycling and downcycling of MLP (Multi-Layer mixed Plastic) and PET containers, covers, other articles and bottles; Reuse as source substitution via Pyrolysis; Return to the planet in the form of biomass, if the plastic waste remains uncollected.

Replicability and Scalability

The above initiatives demonstrate significant potential for replicability and scalability within the framework of a circular economy. These programs are designed to be adaptable to diverse communities and regions, offering sustainable solutions that can be expanded and customized according to local needs.

Impact

- This initiative is expected to reduce the group's carbon footprint by 19,000 tons annually. Additionally, the company has agreed with a third party to provide 12 MW of solar power to the Noida plant.
- In 2024, UFlex reached a total of 21,389 beneficiaries through its CSR initiatives - rejuvenation of 12 local water bodies in the National Capital Region (NCR), and imparting knowledge to students in 13 schools about plastic waste segregation and management.
- The company generated a total of 31,172 MT of waste in FY24, which was 1,112 MT less than the total waste generated in 2023.

To know more

Contact

Neeru Dhawan
Corporate Communication, Head-Corporate Communication
UFlex Limited
neeru.dhawan@uflexltd.com

Waste to Wealth: Innovative Practices By Sahyadri Farms

State/UT	Maharashtra
Department/ Organisation	Sahyadri Farms Post Harvest Care Ltd

Introduction

Sahyadri Farms is India's largest farmer-owned and farmer-led enterprise that integrates over 26,000 farmers into a structured, technology-driven value chain to ensure profitability, quality, and environmental responsibility. They were recognised by India's Economic Survey 2024.

Activities

At Sahyadri Farms, ensure 100 percent utilisation of their farm's produce. They focus on converting agricultural waste into valuable resources, enhancing productivity while minimising carbon footprints. They convert farm and processing waste into biogas, which serves as a clean energy source for operations. This reduces dependency on conventional fuels and generates organic fertilizers that enrich soil health. They harness microalgae to absorb CO_2 and produce high-value bio-products like biofertilizers, animal feed, and nutraceuticals. This innovative approach supports creates a closed-loop agricultural system. Large-scale solar panels are installed at the farms. Through these initiatives, Sahyadri Farms have created a zero-waste horticulture ecosystem, ensuring that every by-product is repurposed for maximum value.

Integration with Circular Economy

Agricultural residues, fruit pulp waste, and other organic matter are processed in biogas plants, generating clean energy that powers farm operations and processing units. The by-product, organic slurry, is used as a natural fertiliser. Microalgae play a critical role in absorbing CO_2 from processing units, transforming emissions into valuable products like biofertilizers and livestock feed. Large-scale solar panels installed at Sahyadri Farms power irrigation systems, processing units, and cold storage facilities. Advanced drip irrigation and rainwater harvesting minimize water usage while maximizing yield efficiency. By-products like fruit peels, seeds, and pulp residues are repurposed into essential oils, dietary fibers, and livestock feed.

Replicability and Scalability

It can be replicable to across horticulture segment in India and outside India.

Impact

- 100 percent resource utilization – No waste, only value-added products.
- Carbon footprint reduction – Cleaner energy, lower emissions, regenerative farming.
- 26,000+ farmers benefit from sustainable, profitable farming practices.
- Future-ready agriculture – Sustainable inputs, higher productivity, global competitiveness.

To know more

Contact

Santosh Watpade
CFO
Sahyadri Farms Post Harvest Care Ltd
Santosh.watpade@sahyarifarms.com

Ministry of Housing and Urban Affairs
Government of India

AN SBM INITIATIVE

INDIA'S CIRCULAR SUTRA A COMPENDIUM OF GOOD PRACTICES