

To,

Mr. Arvind Kavia & Ms. Unnimaya Balasundaran,  
National Institute of Disaster Management,  
(Ministry of Home Affairs, Government of India),  
Plot no-15, Pocket-3, Block-b, Sector-29,  
Delhi-110042

**Subject-Submission of Best Practice Model on Urban Resilience on Solid Waste Management by EPMCind**

Sir/Madam,

With reference to the above, this is to state EPMCind an ISO certified company would like to submit its best practice model on Solid Waste Management to NIDM. The proposed model addresses the sub-thematic area "Solid Waste Management and Sanitation" under the theme "Sustainable Urban Development". The proposed model was implemented by Mal Municipality with EPMCind serving as the technical partner throughout the entire system. This consultancy firm provided comprehensive project support, including the processing of wet waste into organic compost and facilitating its sale in the market. Additionally, EPMCind was responsible for establishing market linkages for the dry waste.

This is to mention that Waste management is a burning issue now-a-day. Most importantly landfill crisis and environmental hazards are the vital issues to be taken care of. Generally waste displacement has become a general practice, where waste is carried from point of generation to point of disposal. But that can never be a solution in modern era as it is already proven that continuous deposition of waste has created immense irreparable danger to our environment. Thus, EPMCind came forward to address the issue of dumping of waste in the Mal Municipality in North Bengal. The project was to convert the segregated wet waste into organic compost and channelize it for revenue generation. (The project details enclosed in Annexure-2)

EPMCind is a multi-disciplinary environmental engineering and consulting firm, serving nationally and internationally acclaimed private and government organizations. We have expertise in conducting **Environmental assessment (ESIA, ESDD, IEE, ESG, ESMS, and ESMF), Social and Livelihood Assessment (SIA, R&R, LIA, and LRP), CSR impact assessment, Ecology and Biodiversity studies, solid waste management.** We are a team of dedicated diversified professionals with extensive knowledge and experience in conducting studies across India/International. We offer a broad range of environmental and social consulting services with a strong focus on comprehensive and multidisciplinary assessments (EPMCind brochure enclosed).

We are pleased to submit this proposal with the hopeful expectation that it will be selected, and we look forward to the opportunity it presents.

Thanking you,

Yours Faithfully,



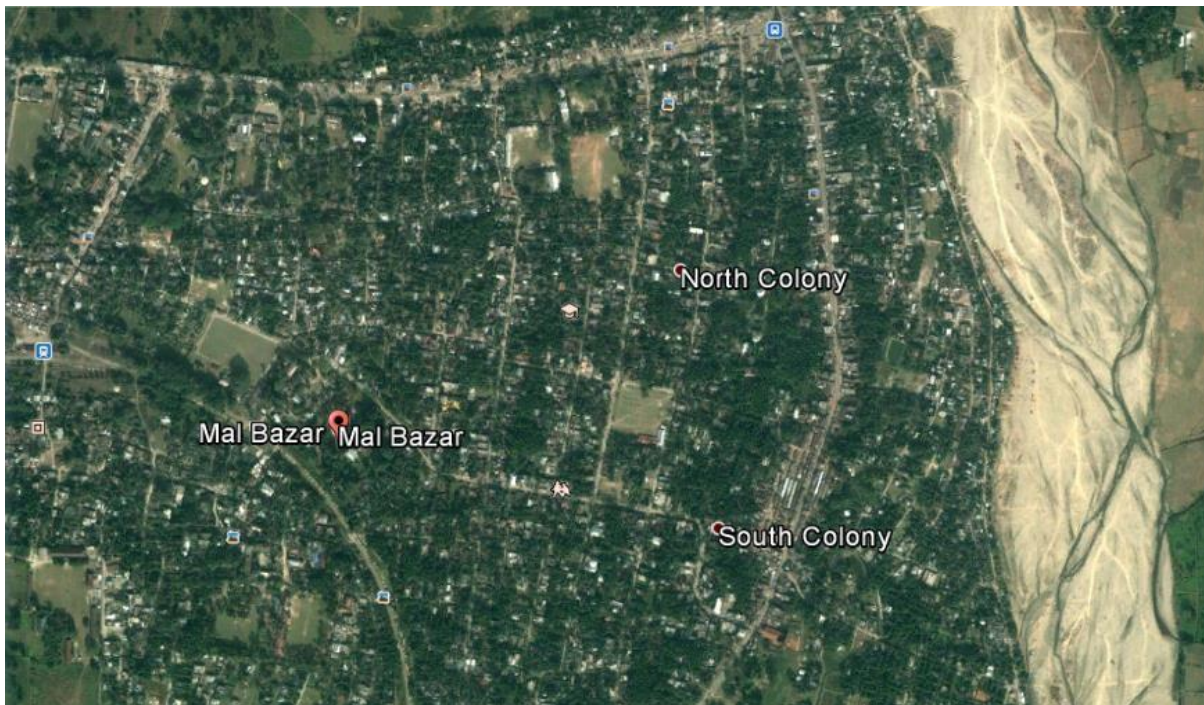
Alok Chandra Adhikari,

**Partner, EPMCind**



## Thematic Area: Sustainable Urban Development

### Sub-thematic area: Solid Waste Management and Sanitation



#### Title and Location:

Decentralized Model of Municipal Solid Waste Management at Mal Municipality, Jalpaiguri, West Bengal

Presented by

**Environment Planning Management Consultancy**

***Environmental Planning Management Consultancy  
an ISO 9001:2015 certified company***

## About EPMCind

Environmental Planning Management Consultancy (EPMCind) is an ISO-certified company that started its journey in the year 2016. EPMCind is a multi-disciplinary environmental engineering and consulting firm, serving nationally and internationally acclaimed private and government organizations. We have expertise in conducting **Environmental assessment (ESIA, ESDD, IEE, ESG, ESMS, and ESMF), Social and Livelihood Assessment (SIA, R&R, LIA, and LRP), CSR impact assessment, Ecology and Biodiversity studies, solid waste management.** We are a team of dedicated diversified professionals with extensive knowledge and experience in conducting studies across India/International. We offer a broad range of environmental and social consulting services with a strong focus on comprehensive and multidisciplinary assessments.

We undertake independent studies and audits, offer the technical support needed to complete the comprehensive and timely review of a project. Our detailed due diligence assessment report submitted at the end of the study will highlight & summarize the project performance relative to a range of assessment criteria viz environmental, safety and social aspects of the project. The reports are organized to provide necessary information in a user-friendly format – with findings prioritized and tabulated according to risk. The technical content is based on the nature, scale and scope of the project that is being assessed.

## The Urban Resilience

1. Flood risk mitigation infrastructure & services focus on mitigating the negative impacts of recurring flooding through a hybrid approach that combines green and grey infrastructure including urban drainage & associated road works & Nature Based Solutions for erosion control and water retention.
  - Urban drainage and associated networks
  - Nature Based Solutions
  - Emergency preparedness & early warning system
  - Resilient urban planning
2. Improvement of Solid Waste Management infrastructure
  - Strengthening Solid Waste Management capacities
  - Strengthening sector governance, institutional capacity & citizen engagement
  - Improving Solid Waste Management through community engagement
3. Support Project Management activities
4. Contingent emergency response component for natural or artificial crisis.

## Why Urban Resilience

### Ensuring Participation of the Citizens in the Project by:

- Inter-connected risk drivers (i.e., poverty, inequality, unplanned urban development, weak governance, decline of ecosystems) are creating an urban landscape of multiple shocks, pressures, and increased vulnerabilities.



- Systems level crisis is heavily impacting urban areas. Many cities face vulnerabilities in terms of water, food, health, energy, and ecosystems as well as climate and conflict-driven urban migration.
- Rapid urbanization has increased this exposure and vulnerability to disaster risk. This is particularly the case in urban areas in LDCs and SIDS, as well as in smaller, and medium-sized cities and peri-urban areas in all contexts.
- There has been limited progress in the development of local disaster risk reduction strategies as well as access to quality data and reliable risk information. Existing solutions, such as from the private sector, are not being shared at scale.
- Significant gaps persist in terms of local capacities, inclusive and integrated risk reduction strategies as well as access to data and finance.

## Waste management

- Waste management is a burning issue now-a-day. Most importantly landfill crisis and environmental hazards are the vital issues to be taken care of. Generally waste displacement has become a general practice, where waste is carried from point of generation to point of disposal. But that can never be a solution in modern era as it is already proven that continuous deposition of waste has created immense irreparable danger to our environment.

### Before Situation:

Waste displacement has become a common practice, where waste is simply moved from its point of generation to a disposal site. However, this approach is not a viable solution in today's world. It has been well established that the continuous accumulation of waste poses significant and often irreversible threats to our environment.





## Implemented Measure:

The Municipality implemented a solid waste management program, with EPMCind serving as the technical partner throughout the entire system. This consultancy firm provided comprehensive project support, including the processing of wet waste into organic compost and facilitating its sale in the market. Additionally, EPMCind was responsible for establishing market linkages for the dry waste.

The implementation process consists of a systematic series of steps, from primary collection to the final product of compost. The end product was procured by Mission Hill Tea Garden.

The proposed model for wet waste management system is described below:

### A. Primary Collection





## B. Unloading



## C. Manual Segregation on Segregation Tables



## D. Shredding of large sized waste materials in a slow speed shredder

The system provides optimum supply of oxygen, temperature and moisture promoting growth of microorganism. The resulting pre-compost which comes of the tumbler is emptied into crates and taken for loading into fogging and curing system in the assured racks. Flowing process given below.



### E. Process Description of the Mechanical Composter

Mechanical composting is a system where a tumbler with chopper-agitator assembly made of stainless steel is designed to ensure shredding and mixing of waste with the beneficial microbes and moisture absorber to produce odourless mixture. The temperature during composting rises to 55-to-75-degree centigrade ensuring removal of foul odour. Moisture content is maintained to 75% to prevent drying of microorganism. Presence of microbes as catalyst directs the composting towards aerobic composting, producing desired quality of compost whose pH is neutral and C: N ratio is within 20 to 25. This compost is capable of meeting the demand of organic fertilizer for agriculture.





## F. Unloading Ready Compost



## G. 10-day curing in Curing Systems consisting of racks, crates and automated moisture control system





## H. Manually fine filtration



## I. Ready Organic Compost



## Significant Effect after implementation (expected in case of research):

### Ensuring Participation of the Citizens in the Project by:

- ❖ Segregating Waste at Source
- ❖ Delivering segregated Waste to Municipal Waste
- ❖ Collectors avoiding 'throw away' practice altogether
- ❖ Changing Behaviour Pattern in Waste Disposal at all levels.
- ❖ Sharing responsibility by bearing financial responsibility as a token of support
- ❖ Motivating the municipality to be a perfect service provider in SWM
- ❖ Involving young people to work as a go between the project and the people.
- ❖ Motivating people of all sections to segregate waste at source.
- ❖ Make people aware about Environment, Health & Hygiene through appropriate management of waste.
- ❖ Motivating people of all sections to segregate waste at source.



## Financial Details for the wet waste management: Investment

Particulars	Unit	Total Cost (INR)
<b>A. INSTALLATION OF COMPOSTER</b>		
Organic Waste Composter along with stand and Plastic Crate (Taxes =As applicable GST 12%) Approx.	1 MT	12,00,000
Transportation & Installation cost		70,000
Weighing machine (Taxes =As applicable GST 12%)	1	15,000
Separator table	2	30,000
Sewing machine	1	5,000
Sacks	50 X 12	60,000
Crusher Machine (Taxes =As applicable GST 12%)	1	4,50,000
<b>Sub Total</b>		<b>18,30,000</b>
<b>B. CONSERVENCY &amp; OTHER ACCESSORIES</b>		
Sawdust (Dry substrates)		15,000
Compost Beneficial Microbes		5,000
Bags for packing fertilizer		5,000
Gloves, Masks, Apron and shoe		5,000
Operation & Maintenance		15,000
<b>Sub Total</b>		<b>45,000</b>
<b>C. OPERATION AND MAINTENANCE</b>		
Plant Supervisor	1	30,000
Technical Expert	1	30,000
Project Management Fee		20,000
Food and Transportation expanses (Technical expert and plant supervisor)		10,000
<b>Sub Total</b>		<b>90,000</b>
<b>Note: The rate quoted for operation &amp; maintenance cost (in row B &amp; C) should be per month</b>		

### Income Sources

- ❖ User Fee
- ❖ Sale of Compost items
- ❖ Sale of recyclables

## User Category

Sl.	User Category	Service Charge (monthly)	Remarks
1	Households	Rs.100	Payable monthly
2	Tea stalls	Rs.50	Payable monthly
3	Marriage halls if any	Rs.2000	Payable after every marriage
4	Vegetable markets	Rs.500	Payable monthly
5	Mutton & chicken stalls / Fish markets	Rs.500	Payable weekly
6	Grocery shops	Rs.50	Payable monthly
7	Pvt. Schools and offices	Rs. 50	Payable monthly
8	Temples, churches, mosques etc. (unless they have their own waste disposal arrangement)	---	Collected from the community along with the collection made for temple festivals / local festivals.
9	Others (such as dispensaries)	----	

## Other major details:

### Benefit of Project

- ❖ Decentralized process
- ❖ Very simple process of operation (no skilled labour required).
- ❖ As both the system are portable **NO** fixed land area is needed
- ❖ Converts wet waste into organic fertilizer in very short time of **8 to12 days**.
- ❖ The organic fertilizer from both the sources can be used internally for gardens or also can be commercially sold off
- ❖ Complete elimination of all wet waste
- ❖ Freedom from stinking smells, rodent, flies and consequently diseases
- ❖ Noiseless and Odourless process
- ❖ Dry waste is also a source for revenue generation
- ❖ Once the wet waste gets separated the dry waste will be obtained in good condition in larger amount.



The proposed model for Dry Waste management system is described below:

### A. Transportation of Dry waste



### B. Unloading





### C. Segregation Stage



### D. Ready for Sale





IEC materials developed for the project.

### মাল পৌরসভা কঠিন বর্জ্য ব্যবস্থাপন উন্নয়ন প্রকল্প

স্বচ্ছ ভারত  
কে ভারত বদলে দেবে

মিশ্রিত  
বর্জ্য

আমাদের প্রয়াস পরিষ্কার শহর-পরিচ্ছন্ন শহর

### মাল পৌরসভা কঠিন কুড়া বৈহতরীকরণ পরियोजना

मे शुचि दिदि!  
परिवेश को सुरक्षित रखने में सचेतन हूँ!  
क्या आप लोग है?

स्वच्छ भारत  
एक कदम स्वच्छता की ओर

मिश्रित  
बर्ज्य

आपदानशील  
झोला, जूना मिली,  
के बर्तन, घातु,  
प्लास्टिक के टुकड़े,  
रबड़, चमड़े के  
सामान, कागज,  
ईंट पत्थर आदि

पचनशील  
मछली, मांस,  
अंडा का अवशेष,  
फूल, फल, एरब,  
सब्जी का  
छिल्ला आदि

पठिक शायद  
सबसे ज्यादा  
परिचरणा  
प

कूड़ा-कचड़ा मुक्त निर्मल और सुन्दर बाताबरण

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**Environmental  
Planning  
Management  
Consultancy**

◀— Keep the ocean blue and the planet green, as that's the only way to sustain human beings —▶

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An ISO 9001 : 2015 Certified Company



EPMCind

ENVIRONMENTAL PLANNING MANAGEMENT CONSULTANCY



## WHO WE ARE

Environmental Planning Management Consultancy (EPMCind) started its journey from 2016. EPMCind is a multi-disciplinary environmental engineering and consulting firm comprising a team of experienced scientists, specialists, experts and engineers that provide high-quality consulting services to private and government organisations with clients focusing both nationally and internationally. EPMCind's professionals are experienced in conducting ESIA, ESG, ESDD and EHS Audit Assessments as per National & International Standards.

## MISSION

EPMCind persistently seeks to scale the height of excellence in terms of quality services embedded with best practices by embracing innovative approaches through effective utilisation of human capital to advocate a sustainable future.

## VISION

EPMCind aspires to become a preferred choice as a global service provider in shaping a sustainable future through knowledge transfer and value creation.

“Keep the Ocean blue and the planet green, that’s the only way sustain human being.”




## OUR SERVICES



Environmental Compliance Audit

Carbon Footprint




Social & Livelihood Assessment

Solid Waste Management




Ecology & Biodiversity Assessment

Nature Based Solution




Environmental, Social & Governance (ESG)



**Environmental Planning Management Consultancy**

Hydro-Geology Assessment






## CORPORATE DISTINCTION

- ✓ Service Excellence
- ✓ Quality Assurance
- ✓ Committed Management
- ✓ Strict Business Policy
- ✓ Experienced Multidisciplinary Team

## COMPANY'S BUSINESS GROWTH



“Keep the Ocean blue and the planet green, that’s the only way sustain human being.”

## *JV/Association*



“Strategic Partner Agreement” between EPMCind and AFC INDIA LIMITED.



“Strategic Partner Agreement” between EPMCind and IISWBM.



“Strategic Partner Agreement” between EPMCind and Sustainable Environment and Ecological Development Society (SEEDS).



EPMCind and SMEW Ecological Solutions Pvt. Ltd. collaborate on projects related to various Ecological Studies at Project areas.



EPMCind and Mitra SK Private Limited collaborate on projects related to environmental assessment, monitoring, testing, and analysis.





EPMCind

## Our Clients



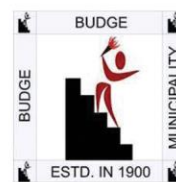
ReNew



Sterlite Power serentica



ELAB



FICHTNER INDIA



## Expert's Experience with FI & Statutory Bodies



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# OUR PRESENCE IN INDIA



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Bangalore - 560083

OUR PROJECT EXPERIENCE



RAJASTHAN



KARNATAKA



MAHARASHTRA



MADHYA PRADESH



ANDHRA PRADESH



TAMILNADU



GUJARAT



DELHI



WEST BENGAL



TELENGANA