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RAIN CEMENTS LIMITED, UNIT 2

RAIN CEMENTS LIMITED

CII NATIONAL AWARD FOR ENVIRONMENTAL BEST PRACTICES - 2025

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Inhouse Waste Management Facility for handling Domestic household waste & Organic Waste.

Project Objective:

- ✓ Strengthening the existing process & system in place
- ✓ Avoiding contamination by improper disposal
- ✓ Ensuring segregation at source
- ✓ To gain the value from the waste generated
- ✓ Avoiding legal complications
- ✓ Creating a circular Economy

Project Trigger:

- ✓ Maintaining good sanitation practice across the campus.
- ✓ Improving the existing waste generation process & system in place.
- ✓ Managing Garden waste from vast landscape area of the campus.
- ✓ Avoiding contamination by improper disposal.

Project Uniqueness:

- ✓ Creating value out of wastes generated i.e., manure.
- ✓ Closed loop industrial ecosystem in waste management.

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Project Journey & Overview

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Project Journey:

Before: Waste collection & segregation was done without proper infrastructure and the value out of the waste collected was lost.

Nov 2020: Proposed 3200 Sq ft building **proposed** for Zero Waste Management at RCL Unit II.

2021: Zero Waste management facility @ RCL Unit II, **commencing operations**

2021: Implemented a **proper waste segregation & collection system** at source by use of Auto & color-coded bins.

2022: Processing on an average about **40 Tons of Dry waste & 45 Tons of wet waste per annum.**

Manpower Details:
Supervisor- **1 Pax;**
Helpers: **7 Pax;**
EV Auto Drivers: **2 Pax**

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Tangible Benefits

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- *Reduced Waste Disposal Costs*
- *Material Recovery*
- *Carbon emission Reduction*
- *SOC, SOM & Water retention*
- ***Emission saved: 28.3 Ton of CO2e/year***

Savings on use of Plastic waste as fuel:

Description	Quantity	UOM
Plastic quantity	38	tons
Moisture	10	%
Total Moisture	3.8	tons
Total Plastic	34.2	Tons
Plastic CV	2500	Kcal / kg clinker
Imported Coal CV	7000	Kcal / kg clinker
Coal Saving	12.21	Tons
Coal cost per ton	12930	(Rs/Mt)
Savings per year	1,57,931	Rupees

Carbon Emission saved by use of EV:

- ✓ Distance travelled per day by all EV's for collection: 20 Kms (Up & Down)
- ✓ Distance travelled per year: 7300 Kms
- ✓ (1)Emissions generated by use of diesel fuel (Kg CO2/km): 0.1322
- ✓ **Emissions saved over a year: 956.06 Kg CO2.**
- ✓ **Emissions saved over 2 year period: 1930 Kg CO2 (OR) 1.93 Tons of CO2.**

Carbon Emission saved by incinerating with Energy Recovery instead of Landfilling (Plastic Waste):

- ✓ Avg weight of food waste composted/year: 40 Tons
- ✓ (3)Emissions saved by incinerating with Energy recovery instead of landfilling (Kg CO2e/tonne): 38 Kg CO2e/tonne
- ✓ **Emissions saved over a year: 1,520 Kg CO2e.**
- ✓ **Emissions saved over 2 year period: 3,040 Kg CO2e.**

Carbon Emission saved by composting instead of Landfilling (organic Waste):

- ✓ Avg weight of food waste composted/year: 45 Tons
- ✓ (2)Emissions saved by composting instead of landfilling (Kg CO2e/tonne): 574
- ✓ **Emissions saved over a year: 25,830 Kg CO2e.**
- ✓ **Emissions saved over 2 year period: 51,660 Kg CO2e.**

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(1) Transport emissions (2) Emission saved from Composting instead of Landfilling (3). Emission factor for plastic with ER

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Description	Quantity
Cows	24
Female Calf	28
Bulls	04
Male Calf	13

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Eco friendly Soil Health Enrichment Practices

Project Objective:

- Improving soil health and productivity.
- Reducing landscape maintenance costs.
- Encouraging eco-friendly and regenerative landscaping practices.
- Empowering self-reliant practices.

Project Trigger:

- Avoiding Chemical usage for Landscape to protect & manage cow health.
- Waste management (Cow Dung & Urine)

Project Uniqueness:

- Low-budget natural farming using in-house cow dung and urine.
- Complete fertilizer self-sufficiency for all plantations.
- No-waste approach with full utilization of cow by-products.
- In house Vetinary doctor.

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Process Overview

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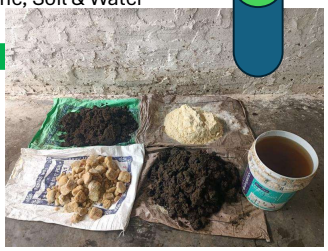
We use In-house Goshala Female Cows for collecting Cow Dung & Urine

Ingredients :
Besan, Organic Jaggery, Fresh Cow Dung, Urine, Soil & Water

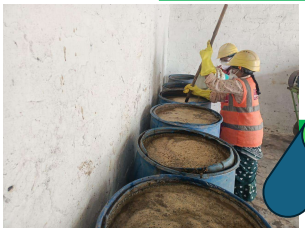
2



3

Mixing urine in water and all ingredients together thoroughly

4



Mix all mixture of ingredients in 1600Ltrs of water and mix alternate days for 7 days.

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Tangible Benefits

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Emission Reduction by eliminating use of DAP fertilizers:

- Emissions factor for per Kg of DAP fertilizer production: 0.48 Kg CO2e/Kg
- Quantity of DAP fertilizer use eliminated by use of Jeevamurtham: 2250 Kgs
- Emissions generated by use of DAP fertilizer (Kg CO2e/year): 1080 Kg CO2e/year
- **Emissions generated over 3 year period: 3240 Kg CO2 (OR) 3.24 Tons of CO2.**

Economical Savings by use of Jeevamrutham as manure:

Description	Quantity	UOM
Cost of DAP fertilizer	1300	INR/50 Kg bag
Qty of DAP required monthly	45 bags (2250 Kgs)	Kgs
Cost per bag	1300	INR
Total cost of DAP/month	58,500	INR
Total cost of DAP/year	7,02,000	INR
Total volume of Jeevamrutham per year	38400	Liters
Cost of making Jeevamrutham (per Liter)	1.5	INR
Cost of making 38400 Liters	57,600	INR
Total Cost Saved per year	**6,44,400**	**INR**

Tangible Benefits of Cattle & its manure	
Soil Fertility Enhancement- Rich in Nitrogen(N), Phosphorus (P), Potassium (K).	**Organic/Regenerative Farming-** Integrating livestock in Farming.
Soil Moisture Retention- Reduced watering frequency & maintenance cost	**Environmental Stewardship**
Educational Value	**Healthy Soil**
Increase in Soil Organic Matter (SOM)- SOM plays a crucial role in improving soil structure, water-holding capacity, and nutrient availability.	**Stabilizing Soil Organic Carbon (SOC)-** Increases the changeable fractions of carbon (C) & nitrogen (N) and enhance soil microbial activity.

https://www.climatiq.io/data/emission-factor/96f313b1-fda1-4efe-b9a2-77a2321774e5

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Intangible Benefits

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Zero Waste Management Unit

People/Society benefits:

- Safe, dignified and fair income jobs.
- Circular Economy.
- Source Level Segregation
- Maintaining hygiene across plant & colony.
- Awareness on Waste segregation

Attitude/Shift Development:

- Value of job in Waste management.
- Value in waste – Wealth out of Waste.
- Responsible & Sustainable practices

Soil Enrichment Practices

People/Society benefits:

- Healthy soil.
- Higher survival rate of plantations.
- Minimizing water usage for Landscape.
- Carbon Sequestration.

Attitude/Shift Development:

- Value of Soil
- Natural Farming Practices
- Value of Cow dung & Urine.

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Replication Potential

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Zero Waste Management Unit

Cross functional/Within group companies:

- Replicated in our other cement manufacturing plant.

Plan for further Scale Up:

- Plan to implement waste management on a large scale and make use of the waste source as alternate fuel (AF)

Benefits:

- No waste is sent out of the premises/campus.
- Value generation out of waste.
- Job creation

Soil Enrichment Practices

Cross functional/Within group companies:

- Replicated in our other cement manufacturing plant.

Beyond Group/Within Sector:

- One of a kind implementation within a cement plant sector.
- In nearby villages by farmers under CSR.

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National Benchmark/Standard

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Zero Waste Management Unit

Solid Waste Management Rules, 2016:

- Segregation of waste into bio-degradable, non-biodegradable.
- Practising waste Segregation
- Segregation & storage of waste at source.
- Promotion of co-processing in cement plants.

Swachh Bharat Mission – Urban (SBM-U) Benchmarks

- Effecting behavioural change
- Decentralized waste management System

Soil Enrichment Practices

National Mission on Natural Farming:

- Integrated with Livestock (agriculture-animal husbandry model)
- involves use of on-farm inputs like Beejamrut, ***Jeevamrut, Ghan Jeevamrut***, Neemastra, Dashparni, etc.,
- improves soil structure, nutrition & soil organic carbon, enhances moisture retention & water holding capacity.
- On-farm innovations like application of multi-species green manure, farm made manure, compost, etc.

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Challenges & Mitigation

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Zero Waste Management Unit

Technical Challenges	Mitigation
Waste Characterization	Learning from PWP as O&M
Managing Emissions, odours.	Best Management Practices & Source Segregation.
Tracking waste quantities/data Management	ZWM data management by Supervisor.
Skilling/Re-skilling	Internal training programs

Maintenance Challenges	Mitigation
Equipment & machinery wear & Tear	Regular maintenance by in-house team.
Skilled Manpower	Continuous training from Inception
Waste contamination	Through Trainings
Frequent Cleaning/use of water	By RWH.
Manpower	Higher perks & benefits.

Soil Enrichment Practices

Technical Challenges	Mitigation
Infrastructure	Strategically located to gather waste across the campus
Fodder generation for cows	Napier grass fields developed & all cut grasses sent to Goshala
Water Supply	Use of Rain Water Harvested
Health monitoring	Vetinary doctor in-house
Waste Management	Trigger for this project.

Maintenance Challenges	Mitigation
Cattle Health check	Weekly basis by our inhouse Vetinary doctor.
Hygiene	Daily basis by the dedicated team.
Cattle Handling	Dedicated team for Cattle handling.
Infrastructure	Every fortnight.

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Future Actions

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Waste Management:

- Capturing bio-gas generated in this facility for our Industrial Canteen.
- Enhancing the process efficiency by introducing aeration.
- Large scale AFR setup as fuel for our cement kilns.

Soil Enrichment- Domino chain reaction towards Climate Change:

- Analyzing Soil carbon impact (SOC & SOM) with respect to our practices.
- Relating the impact on soil carbon content to carbon sink
- Impact of soil carbon content to Soil water retention.
- Impact of soil carbon content to soil infiltration rates.

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THANK YOU