MANIPAL UNIVERSITY JAIPUR

SDG 12

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SUSTAINABLE DEVELOPMENT GOALS

REPORT 2022

MANIPAL UNIVERSITY JAIPUR

SUSTAINABLE DEVELOPMENT GOALS

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SDG 12 focuses on effectively reducing and managing waste, promoting sustainable lifestyles, and managing natural resources sustainably. The focus of the Manipal University Jaipur is to reduce operational waste on campus. Manipal University Jaipur believes in responsible consumption and production for economic growth and focuses on the environment and natural resources but also entails better utilization of waste. Manipal University buys useful products and implements energy-saving schemes from them while preventing wastage, and pollution due to unsegregated waste and instead finds means of conserving our natural resources, air, water, soil, and biodiversity, which are vital for our health and well-being. The current waste management policies and regulations in India especially the Solid Waste Management Rules 2016 in coordination with other Rule s on Plastics, Construction and Demolition, E-waste point exactly in this direction.

Index

1. Road Map For Decarbonization of the Campus
2. Landfill evidence at the campus of MUJ
3. Manipal University Jaipur Minimizing Plastic Use
4. Manipal University Jaipur Minimizing Use of Disposable Items
5. Reducing Waste, Renewing Sustainability, Manipal University Jaipur Measures and Maximizes Recycling Across Campus
6. Measuring Food Waste Generation in Manipal University Jaipur
7. E-Waste management at MUJ

Roadmap for Decarbonization of the campus

- Manipal University, Jaipur

WASTE ROADMAP STRATEGIES

Strategies : **Waste**

Strategy 1: Waste segregation and management

The source separation process involves the segregation of various types of solid waste at the source. By sorting waste, one can identify items that can be reused and set aside items that should be recycled, reducing your overall waste output.

The following should be considered when separating waste:

1. Types of waste (biodegradable and non- biodegradable)
2. Treatment and disposal methods

To implement this strategy, we need following-

- Purchase different types of **dustbins with labels-**
    - I. Dry bin (recyclable waste, paper, cardboard)
    - II. Dry bin (aluminum, glass, plastic)
    - III. Wet bin (food and garden)
    - IV. E waste (cds, wires, electronics)
    - V. Hazardous (medical)
    - VI. Others
- **Third-party contractors** (to collect dry recyclable and e-waste)
- **Quantitate data** (measuring and recording the waste collected + maintain the recycling waste cost)

Total= 70460 Rs

Strategies : Waste

Implementation Steps

Step 1- Segregation Bins-
Have color coded dustbins every 150m-300m, so that the users can make the right choice easily.

Step 2- Encourage Participation-
Waste minimization display on the site noticeboard for awareness at site level.

Step 3- Waste Tracking-
It is important to keep track of how much waste the university generates.

Step 4- Waste Management Plan-

- Assign responsibility (set a management team)
- Define target for waste minimization and circularity
- Tracking of waste generated and output created
- Identify the waste destinations and transport modes
- Communication and training to support and encourage participation
- Reviewing of the plan and periodic updating

Step 5- Waste monitoring solutions-
An ultrasonic sensor is used to measure fullness levels. This helps to detect important incidents such as container's waste level, or in situations like fire, or sudden movements.

Initial Cost Estimation

Cost of 1 bin (100 lts)- INR 1,600/- (one time)
Cost of 15 bin (50 lts)- INR 24,000/- (one time)
Total- INR 24,000 /-
Third party waste hauler- **INR 50,000/month** (recurring)
Approximate revenue generated per year by selling dry waste- **INR 70,460/-**

Timeline

The strategy should be implemented in phases where the bins are purchased in phase one, along with the 3rd party waste hauler. Waste sensors can be added in phase 2, so that users will be adequately informed of the segregation by then.

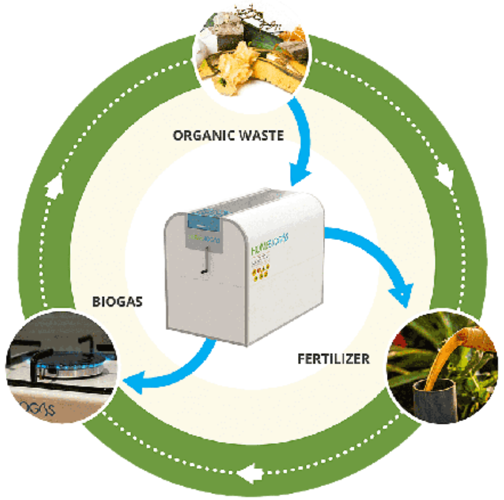
Disclaimer- the waste hauler cost and revenue generated by selling waste is a tentative amount. The cost may be change based on the waste hauler hired and the amount of waste generated in the campus.

SOURCE-
https://www.amazon.in/Nilkamal-AIR-MATIC-Plastic-Wastebin/dp/B08KP22PFG/ref=sr_1_1_sspa?adgrpid=57946502054&ext_vrnc=hi&gclid=CjwKCAjwkaSaBhA4EiwALBgQaMaNvruc7nt8xcUgKsNYpGeXyhfVr4ORGAiMmYpBub43CVuaM1G9UBoCsf0QAvD_BwE&hvadid=381526451458&hvdev=c&hvlocphy=1007768&hvnetw=g&hvqmt=b&hvrand=3736148996670175615&hvtargid=kwd-688298438778&hydadcr=6503_1957732&keywords=dustbin+100+ltr&qid=1665733372&qu=eyJxc2MiOiIzLjc3IiwicXNhIjoiMy4wNSIsInFzcCI6IjAuMDAifQ%3D%3D&sr=8-1-spons&psc=1

Strategies : **Waste**

Strategy 2: Organic Waste to Biogas

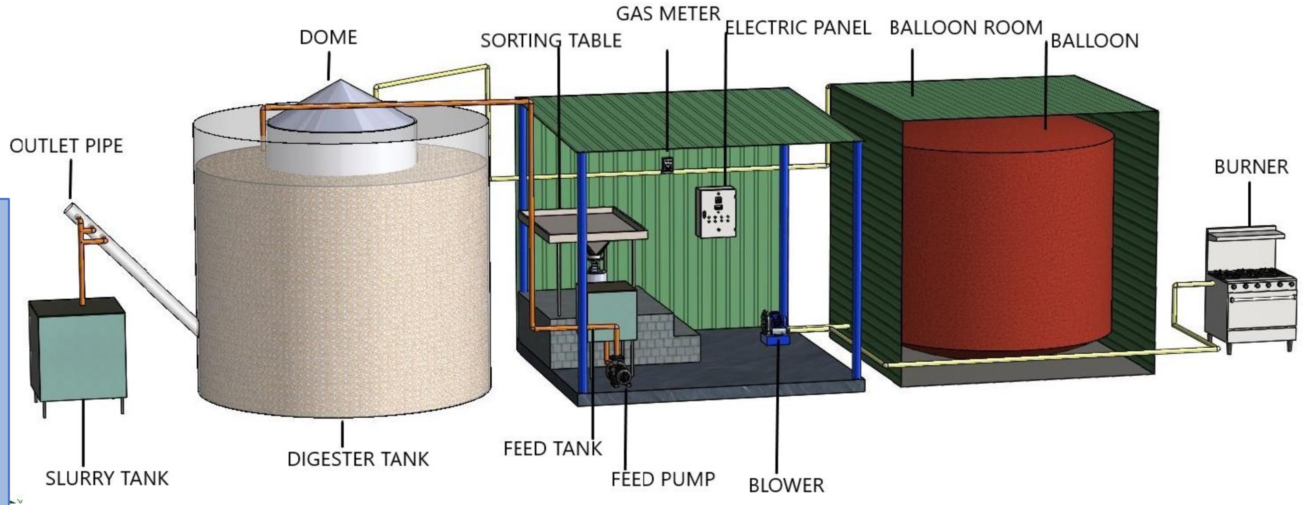
Biodigesters break down organic material such as food waste, agricultural residues, and animal and human manure into biogas, which can then be used for heating, cooking, transportation, and other uses.



Organic waste comprises food, green material, landscape and pruning wastes, organic textiles and carpets, lumber, wood, paper products, printing and writing paper, manure, biosolids, and sludges.

To implement this strategy, we need following-

- **Organic waste segregation bin** in appropriate locations.
- **Staff** to feed the waste and run the machine.
- A **Bio-gas plant** that can convert the organic waste into biogas that can be used for cooking.
- **Quantitate data** (measuring and recording the waste collected + maintaining the bio-gas generated)



Strategies : Waste

Implementation Steps

Step 1- Install organic waste collection bins in appropriate locations all over the campus

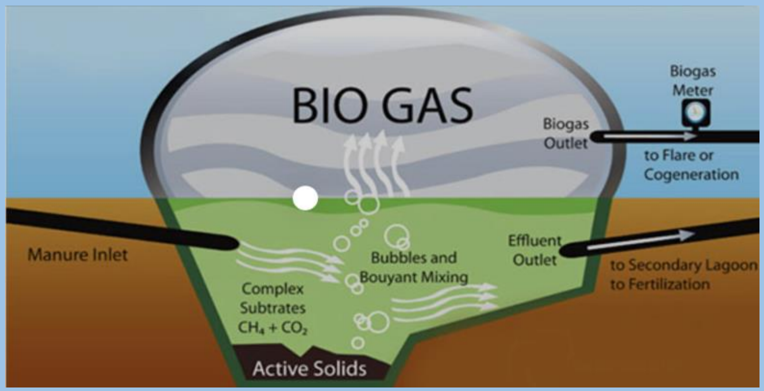
Step 2- Invest in a biogas plant on site and look for a secluded area so that noise doesn't bother anyone. Once the organic waste has been inserted into the machine, it is converted into a gas, which can be used for cooking reducing usage of gas cylinders. Waste is processed by compost machines into usable gas within 15 days.

Step 3- Hire and Educate- Hire a staff of 2 persons and educate them on running the plant and its details.

Step 4- Maintenance and Storage - Make sure the by product manure is stored and handled with care. Store it under dry conditions, so that it can be used properly as required. It is important that there are always Routine operations for predigester and digester tanks

Bio-Gas Plant Details

- **Technology Provider-** 'NISARGUNA' BARC technology
- **Plant Capacity-** 300kg/day
- **Biogas Quantity Generated-** (18-24) CUM of biogas daily, equivalent to (8-10.5)kg LPG, annually contributing to generating about (2.9-3.8) tonnes of LPG equivalent renewable energy. This helps in reducing approximately (73-96)tonnes of carbon -di-oxide annually.



Cost Estimations

Cost of Biogas Plant- INR. 1,00,000 (one time)
Cost of staff(2)- INR 24,000 (recurring)
Total- INR 1,24,000

Approximate revenue generated is INR 6,000/- per megaton. **(1MT= INR 6,000)**

Timeline

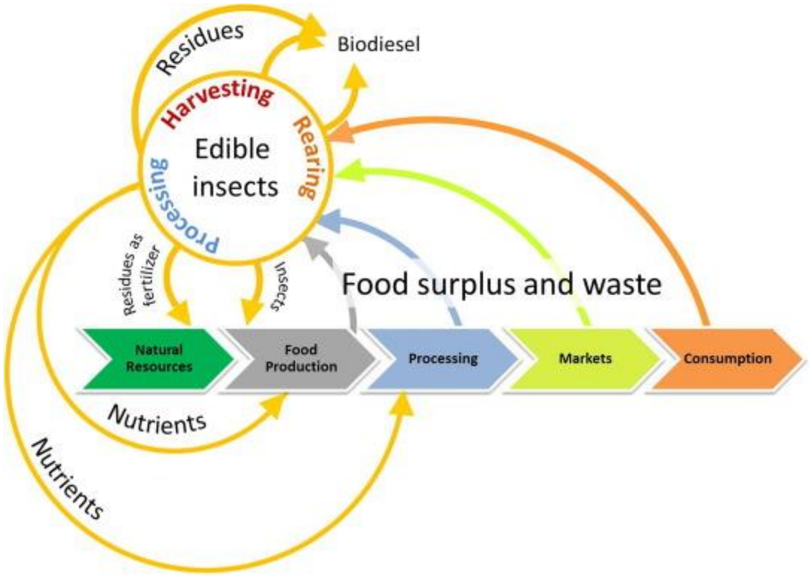
This strategy can be implemented in the scope 1 as the installation and running of the bio-gas is quite simple. The organic waste can be used as a renewable source immediately.

Disclaimer- the waste hauler cost and revenue generated by selling waste is a tentative amount. The cost may be change based on the waste hauler hired and the amount of waste generated in the campus.

Strategy 3: Circular Food System For The Campus

Currently, the regularly consumed fruits, vegetables, grains, cereals, dairy, and bakery products are bought from supermarkets or mandis without considering how much waste they generate (packing, emissions). It is called the Linear Food System. As part of the proposed circular food system, in any product or food or vegetable the entire life cycle from its production to its disposal is considered.

In a circular food system, regenerative production is prioritized, reuse and sharing are encouraged, resource inputs and pollution are minimized, and resource recovery is assured. Thus, they close resource loops and seek cross-sector synergies (e.g. with water and energy systems) to enhance a university's resilience.



To implement this strategy, we need following-

- **Tracking food cycle-** Understanding the contexts and needs of the consumers, as well as identify gaps and challenges that exist across the food chain.
- **Setting up- I**n house food production or sustainable and local sourcing of food (mandating a distance , for instance within 10 kms).
- **Logistics-** Understanding the routes used to transport food to the campus and the use of fossil fuel-powered cars?
- **Food Contractors-** The kitchen staff can share their weekly requirements with local farmers and understand seasonal crops and rotation of crops for menu planning.
- **Advanced Food system-** Smart food processing and waste.
  Organic fertilizer- Mandate the use of only organic fertilizer.

Circular Food System

- **Production** – Local food sourcing, Inhouse food production, saving transportation emissions. Use of Organic Fertilizers.
- **Consumption** – Communication strategies+ engagement strategies
- **Waste** – Upcycle/recycle food packed waste, converting food waste in biogas and manure.

Implementation Steps

Step1- Analyse Existing Food System-
Analyze the current food system, from food production to its waste.

Step 2- Design Circular Food System-

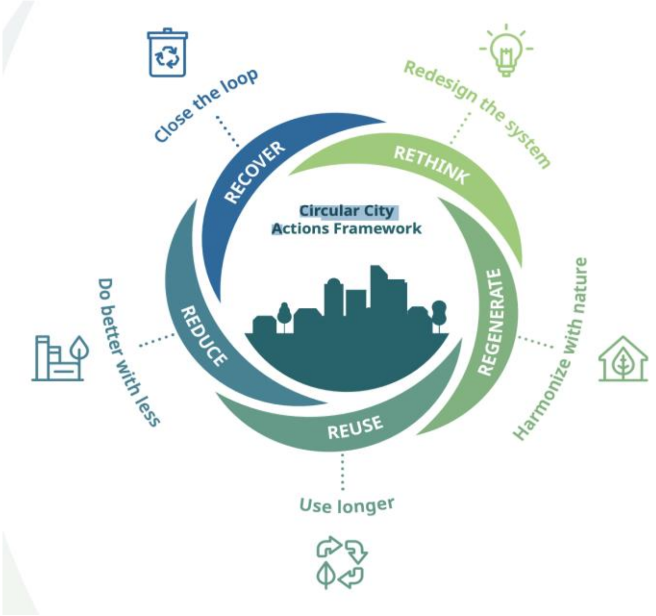
- *Rethink*

encourage re-usable water bottles by creating infrastructure for water re-fill stations. Facilitate synergies among water, energy and food systems.

- *Regenerate*
  1. Sustainable and local sourcing of Food- The raw and processed food needed should be within a range of 10 kms to control the transportation emissions. When food is produced locally,. there is direct access to the farmers. This way, we can ascertain what is the wastage on the farm, what chemicals are used, and what is the seasonality. These will help improve regenerative food production.
  2. In house food production- Identifying places on the University's campus where food can be grown. For instance, agroforestry practices can be used in the periphery of the campus. Green house food production is also recommended.

- *Reuse*

Utilize existing products, infrastructure and resources.



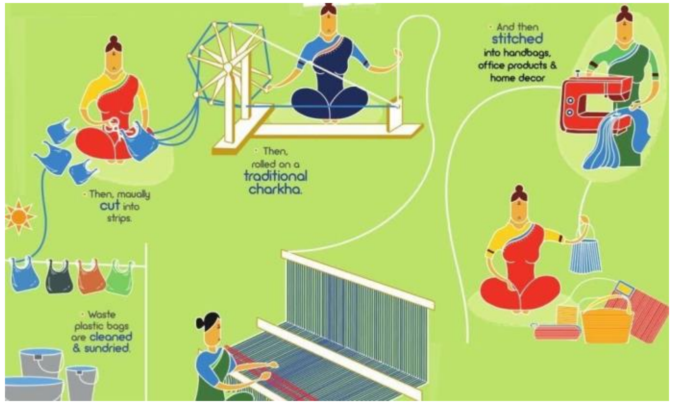
- *Reduce*

Talk to near-by bakery and dairy vendors for returnable packaging. Local sourcing of food will also avoid farm wastes. During consumption of food by students and visitors identify ways to reduce waste. One idea is to redesign serving spoons and educate students to take multiple refills instead of a plate full. The other idea is to place weighing scales underneath food waste bins located in the dining halls. This way students realize how much they are dumping food. Every day the previous day's kilogram reading of the waste can be put up on a board next to the food bin.

Strategies : Waste

- *Recover*

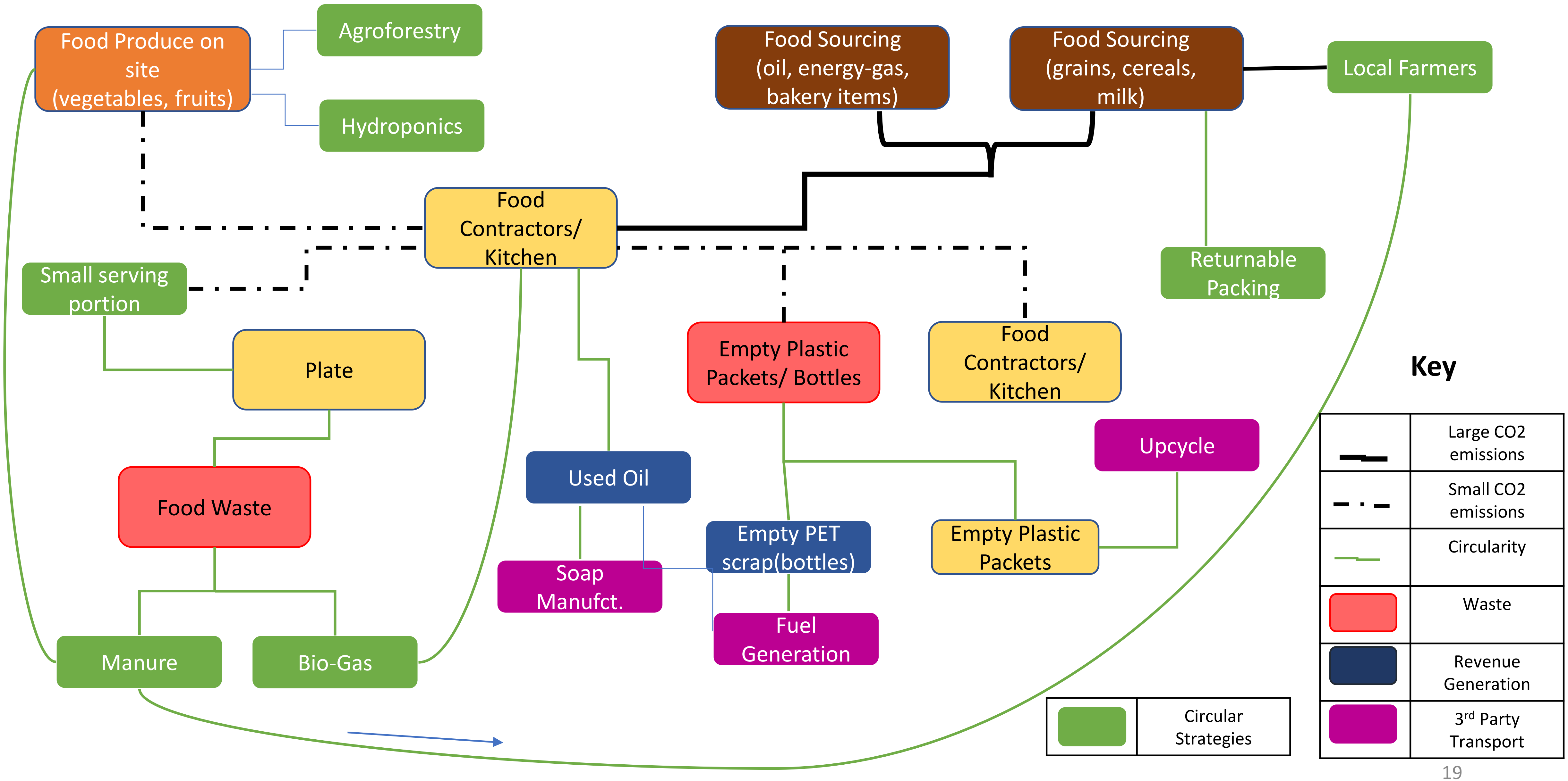
Recovery of food waste at the end of its life and facilitation of its re-introduction into production processes as compost, biogas. All the packaging waste, for instance milk pouches must be washed and kept separately, plastic wrapping packets should be washed and kept separately. The university can further send them to NGO's like Ecokarri, Rechakra who upcycle these into usable products ; thereby reducing the waste going to landfill. Similarly, every PET water bottle used on the entire University campus must be collected and stored separately. These can then be sent to a pyrolysis facility for converting into fuel. All the used oil from each of the contractors should be collected in one place. This oil can then be sold to local soap manufacturers for biodiesel units that used cooking oil as a raw material.



Approaches to make the Food System Circular

- Yellow boxes depict suggested ideas for circularity
- Green boxes depict the activity which can lead to circularity
- Dotted green arrows show the component of circularity
- Dark blue boxes are possible solutions that need to be explored further

Strategies : **Waste**



Step3- Educate -
It is imperative to educate all the food contractors (kitchen staff, supply chain management) so that everyone is on the same page and the circular food system can be easily implemented.

Step 4- **Monitoring and execution system-**
This circular food system would require a lot of resources, co-ordination amongst different managements, students and staff. It is better to set up a monitoring team initially which can guide and review the steps every few weeks and intervene when necessary.

Timeline

The strategy needs to be implemented in phases; strategies such as local sourcing, reusable bottles, and returnable packaging for dairy and bakery items can be implemented in Phase 1.
Others, such as greenhouse production for food, can be implemented in Phase 2. As time passes, users will become comfortable with the new system, and soon it will become an integral part of teaching and learning.

Initial Cost Estimation

Strategies like local food sourcing, can be implemented at no cost.

Cost of planting trees for Agroforestry- INR 1,56,000
Cost of staff - -INR 1,20,000
Cost of constructing Hydroponics -INR 2,600 to 3,500/m2

Approximate revenue generated per kg by selling used oil and PET scrap 80 **Rs/k**

SOURCE-
Hydroponics- https://www.agrifarming.in/hydroponic-farming-in-bangalore-how-to-start-setup-cost-companies-and-suppliers

Landfill evidence at the campus of Manipal University Jaipur

MANIPAL UNIVERSITY
JAIPUR

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Innovative Technology Used for Solid and Liquid Waste Disposal & Management

Food Waste

We are generating biogas by using Organic solid food waste and main part of a biogas system is a digester. Inside this tank, bacteria convert food waste into methane gas through the process of anaerobic digestion (35 kg of methane gas produced from 500 kg of food waste)

SOLID KITCHEN WASTE MANAGEMENT

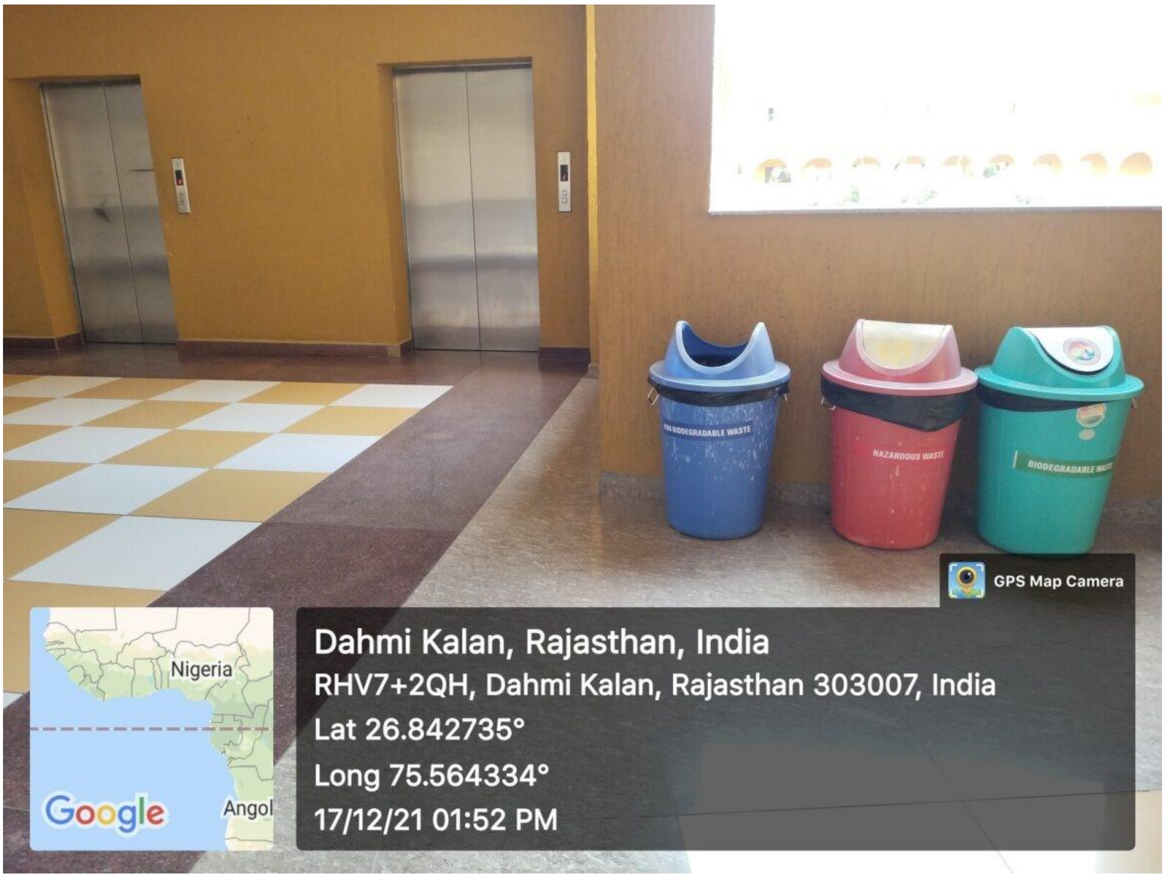
Sr.No.	Department/ Area of source of waste (Everypoint of waste generation within the campus should be identified and listed - cross	Types of waste generated in each of the point source (for each type of waste, use separate row)						Dry (in kgs/ day
		Food wastage	Paper/Card board	Plastic	Wood	Glass	Metal	
Mar-19	MUJ Academic Blocks		6700	65	60		120	7035
Mar-19	MUJ HOSTEL Blocks	4270						
Apr-19	MUJ Academic Blocks		92	33	44	0	20	180
Apr-19	MUJ HOSTEL Blocks	3680					940	940
May-19	MUJ Academic Blocks		73	28	31	2	17	151
May-19	MUJ HOSTEL Blocks	2452		591			860	1451
Jun-19	MUJ Academic Blocks		68	25	31	1	17	142
Jun-19	MUJ HOSTEL Blocks	1160					700	700
Jul-19	MUJ Academic Blocks		85	36	45	0	26	192
Jul-19	MUJ HOSTEL Blocks	4638					240	240
Aug-19	MUJ Academic Blocks		101	40	47	0	29	217
Aug-19	MUJ HOSTEL Blocks	4596		260			380	640
Sep-19	MUJ Academic Blocks		97	30	62	1	37	227
Sep-19	MUJ HOSTEL Blocks	2830						
Oct-19	MUJ Academic Blocks		170	95	92	0	82	357
Oct-19	MUJ HOSTEL Blocks	4799						
Nov-19	MUJ Academic Blocks		66	55	71	0	75	192
Nov-19	MUJ HOSTEL Blocks	4155						
Dec-19	MUJ Academic Blocks		81	58	48	0	45	187
Dec-19	MUJ HOSTEL Blocks	2033						
Jan-20	MUJ Academic Blocks		112	62	51	0	76	225
Jan-20	MUJ HOSTEL Blocks	6195						
Feb-20	MUJ Academic Blocks		73	70	51	8	82	202
Feb-20	MUJ HOSTEL Blocks	6178						
Mar-20	MUJ Academic Blocks		55	50	46	8	48	159
Mar-20	MUJ HOSTEL Blocks	5159						
Apr-20	MUJ Academic Blocks		23	17	26	2	17	68
Apr-20	MUJ HOSTEL Blocks	NIL						
May-20	MUJ Academic Blocks		40	46	35	5	41	126
Jun-20	MUJ Academic Blocks		38	35	24	3	42	100
Jul-20	MUJ Academic Blocks		43	33	33	6	59	115
Aug-20	MUJ Academic Blocks		20	21	31	3	26	75
Sep-20	MUJ Academic Blocks		27	16	22	6	41	71

Collection frequency & clearance: Twice a day

Time: 9:00 AM & 4:00 PM

Picture 1: Student and staff segregating waste, Cleanliness drive.

Picture 2: Different bins to sort different kinds of waste.



Picture 3: Waste disposal bins available at various locations on the campus.

Picture 4: Waste into composing pit, a designated area, where organic waste materials are deposited and allowed to decompose naturally.

Solid waste landfill, a site designed to contain trash. It has specialized structures to reduce the contamination of the surrounding soil or water.

Landfill site at MUJ, behind Academic Block 2

Designating a specific location, Landfills are also currently the best option for how to handle any waste that cannot be recycled, composted, or otherwise given a new purpose.

Landfill site at MUJ, behind Academic Block1

Manipal University Jaipur Minimizing Plastic Use

Plastic pollution has become one of the most pressing environmental issues of our time. Recognizing the urgency of the situation, Manipal University Jaipur has taken significant strides in minimizing plastic use, pioneering innovative solutions, and inspiring change beyond the campuses.

Plastic, due to its durable nature, has inundated the environment, posing a severe threat to ecosystems and human health. Single-use plastics, in particular, contribute to this crisis. From disposable cutlery to packaging materials, these items often end up in landfills, water bodies, or as litter, persisting for hundreds of years and causing harm to wildlife and habitats.

Manipal University Jaipur has stepped forward to combat this environmental threat. These universities are setting examples through a variety of initiatives aimed at reducing, reusing, and recycling plastic. Manipal University Jaipur has implemented comprehensive programs to reduce single-use plastics on the campus, banning or significantly limiting plastic water bottles, utensils, straws, and other non-essential plastic items (Picture 1). Manipal University Jaipur introduced refill stations for water bottles, encouraging students and staff to use reusable containers (Picture 2,3&4). Manipal University Jaipur hotspots for research and innovation. Manipal University Jaipur's departments are conducting innovative research to develop biodegradable alternatives to conventional plastics. From exploring novel materials to studying efficient recycling methods, these endeavors are aimed at creating sustainable alternatives to traditional plastics. Manipal University Jaipur conducts awareness campaigns, workshops, and courses focused on plastic pollution, encouraging students, faculty, and the community to adopt sustainable practices. These educational efforts foster a culture of responsibility towards the environment.

The efforts of the Manipal University Jaipur reverberate far beyond its immediate communities. By pioneering solutions, conducting research, and educating the younger generation, these academic institutions are catalysts for a larger societal shift towards sustainable practices. The commitment, research, and educational outreach by Manipal University Jaipur paves the way for a more sustainable future. As Manipal University Jaipur continues to lead by example, the efforts hold the promise of inspiring and influencing broader societal changes.

PICTURE 1: Students Refilling metal water bottles as water station in campus.

PICTURE 2: Food being served in faculty meeting in reusable and non-plastic utensils.

PICTURE 3: Serving refreshments to support staff in general services in reusable utensils

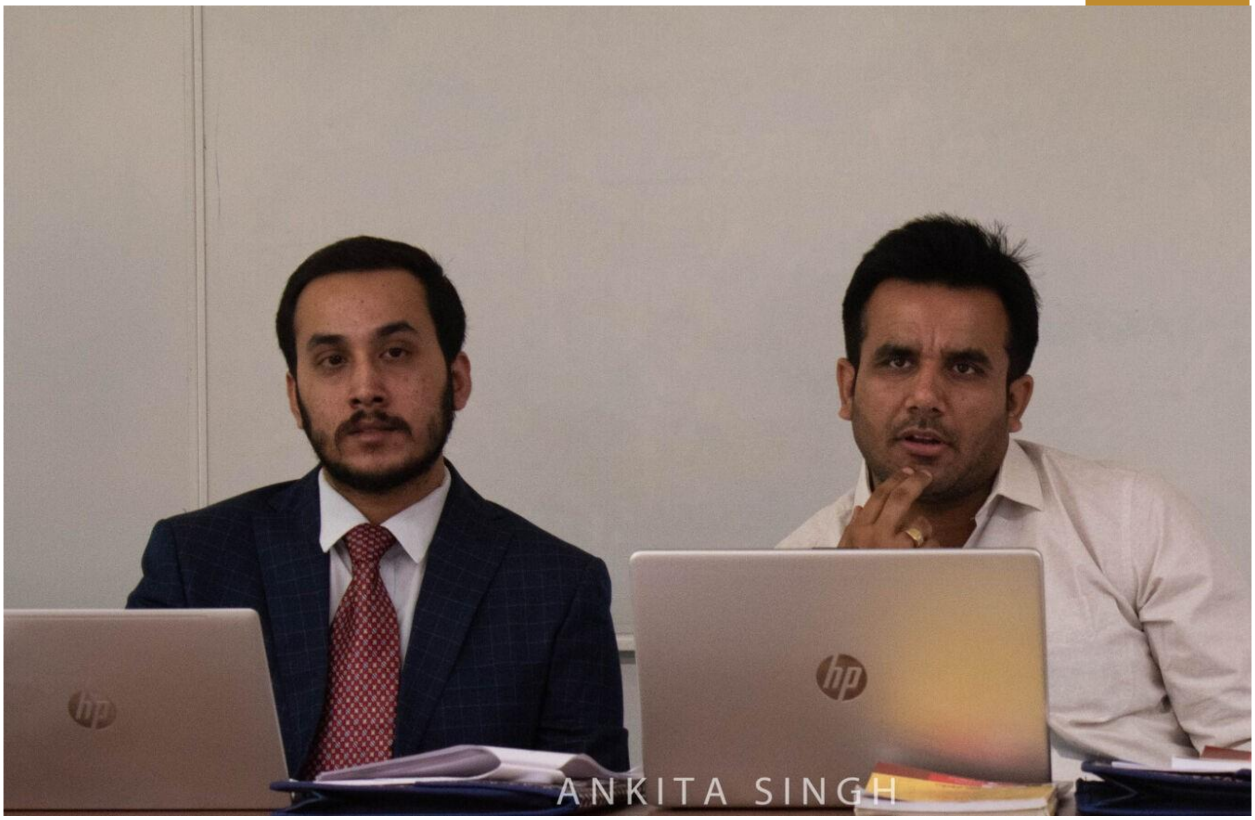
PICTURE 4: Food being served in Re-useable cutlery

Picture 1: Use of steel plates which can be reused

Picture 2: Awareness initiatives through posters for sustainable environment

Picture 3: Use of glass jars replacing the plastic jars

Picture 4: Installation of steel Bain Marie at food service counter



Picture 5: Use of Sustainable folders and laptops in the MUJ events in place of plastic items

Picture 6: Use of smart board for classroom engagement

Picture 7: Use of Sustainable folders at MUJ events

Picture 8: Use of Planters for felicitating dignitaries in MUJ events

Picture 9: Use of wooden mementos to felicitate guests in MUJ events

Manipal University Jaipur Minimizing Use of Disposable Items

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Picture 1: Students Refilling metal water bottles as water station in campus.

Picture 2: Serving refreshments to support staff in general services in reusable utensils

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Picture 3: Food being served in Re-useable cutlery

Picture 4: Promoting use usable products

Picture 5: Encouraging re-use and sustainable practices.

Outsourcing of Suppliers and Supplies Chains at Manipal University Jaipur

Over recent years, one of the biggest worldwide concerns has been ensuring sustainable consumption and production patterns. With the adoption of SDG 12, "Ensure sustainable consumption and production," and growing interest in the circular economy model, there is a chance to establish system-wide goals for all societies, acknowledging that our economic, financial, and governance decision-making are key drivers and solutions. Manipal University Jaipur has a vision to reduce material footprint to follow the vision MUJ has policies on Minimisation of disposable items and minimisation of plastic use. MUJ has issued an advisory to Quess Corps and Chef on Wheels and all the other outscored services providers to abide MUJ's Minimisation policies.

Policy extended to building contractor and supplier:

G 6						Ground Floor
Wall Concrete upto grad slab		Grade Slab PCC		Grade Slab RCC		No. of Rooms concreting
Total Qty in cum	347.8	Total Qty in cum	126	Total Qty in cum	189	31
Completed Qty in cum	348	Completed Qty in cum	126	Completed Qty in cum	189	18
Completion %	100%	Completion %	100%	Completion %	100%	58%

G 5						Ground Floor
Wall Concrete upto grad slab		Grad Slab PCC		Grad Slab RCC		No. of Rooms
Total Qty in cum	347.8	Total Qty in cum	126	Total Qty in cum	189	31
Completed Qty in cum	32.5	Completed Qty in cum	0	Completed Qty in cum	32	0
Completion %	9%	Completion %	0%	Completion %	17%	

G 7						Ground Floor
Wall Concrete upto grad slab		Grad Slab PCC		Grad Slab RCC		No. of Rooms
Total Qty in cum	130	Total Qty in cum	80	Total Qty in cum	120	15
Completed Qty in cum	130	Completed Qty in cum	75	Completed Qty in cum	94.4	0
Completion %	100%	Completion %	94%	Completion %	79%	

Builder and contractors are hired on a contact stating and agreeing upon using sustainable practices, there work is adhering the minimisation policies.

Boys Hostel Blocks

B 8

SL NO	Excavation		PCC		Raft and RC wall up to gradeslab	
1	Total Qty in cum	3211	Total Qty in cum	113	Total Qty in cum	1054.775
2	Completed Qty in cum	3211	Completed Qty in cum	113	Completed Qty in cum	948.8
	Completion %	100%	Completion %	100%	Completion %	90%

B 10

SL NO	Excavation		PCC		Raft and RC wall up to gradeslab	
1	Total Qty in cum	3672	Total Qty in cum	128	Total Qty in cum	1052
2	Completed Qty in cum	3672	Completed Qty in cum	128	Completed Qty in cum	745.8
	Completion %	100%	Completion %	100%	Completion %	71%

B 9

SL NO	Excavation		PCC		Raft and RC wall up to gradeslab	
1	Total Qty in cum	2940	Total Qty in cum	108	Total Qty in cum	832
2	Completed Qty in cum	2220	Completed Qty in cum	80	Completed Qty in cum	363.5
	Completion %	76%	Completion %	74%	Completion %	44%

Construction contractors follows minimisation policies, controlling over waste and using minimum resources.

AC Unit installation in Purchase Office

Chiller Cleaning – Right Wing

Expansion Tank Cleaning – 2 AB

Repair services adhere the policies and try to minimise the waste

Before After

Repair is the best way to attain sustainability, thus MUJ promotes repair.

Outsourced canteens and vendors need to follow minimisation policies and use sustainability

Vendors are not allowed to use plastic disposables and adhere to minimisation policies

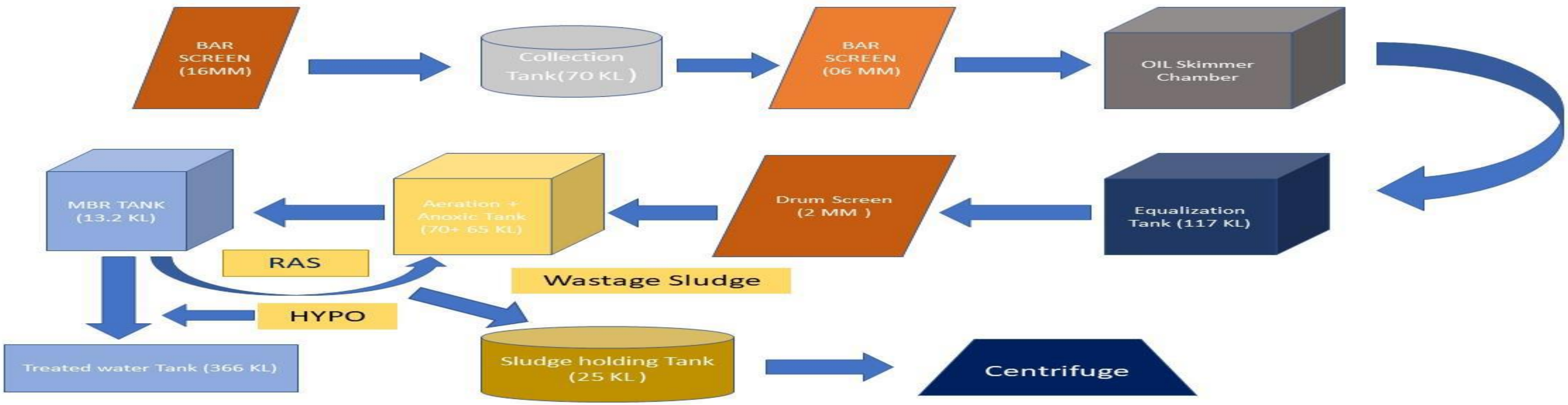
Reducing Waste, Renewing Sustainability, Manipal University Jaipur Measures and Maximizes Recycling Across Campus

Manipal University Jaipur's commitment to sustainability goes beyond the classroom, extending to every aspect of campus life. The measures put in place to monitor and reduce waste generated while maximizing recycling efforts are a testament to the university's dedication to environmental stewardship. By setting ambitious targets, promoting waste reduction at the source, enhancing recycling infrastructure, collaborating with local partners, and fostering innovation, Manipal University Jaipur is paving the way for a greener, more sustainable future.

To effectively address waste reduction and recycling, Manipal University Jaipur began with a thorough waste audit and assessment. This process involved analyzing the types and quantities of waste generated across campus. This step served as a baseline, providing essential data to identify areas where improvements could be made. Manipal University Jaipur understands that to make a real impact, concrete goals must be set. Therefore, the university established ambitious targets for waste reduction and recycling. These targets are specific, measurable, and aligned with the broader sustainability goals of the institution. A fundamental principle of Manipal University Jaipur's approach is to reduce waste at its source. This involves raising awareness and encouraging the campus community to adopt sustainable practices. The university has launched awareness campaigns, educated students and staff on the benefits of waste reduction, and promoted the use of reusable items, reducing the demand for disposable ones. To maximize recycling efforts, Manipal University Jaipur has upgraded its recycling infrastructure across campus. This includes strategically placed recycling bins, improved signage, and ensuring that recycling facilities are easily accessible to all members of the university community. These improvements have significantly increased recycling rates. Manipal University Jaipur recognizes that effective recycling extends beyond campus boundaries. The university collaborates with local recycling partners to ensure that materials are processed efficiently and sustainably. This collaboration fosters a sense of community and supports local environmental initiatives.

Innovation is at the heart of Manipal University Jaipur's sustainability efforts. The university has explored innovative recycling technologies and practices. Manipal University Jaipur has implemented composting programs, converting organic waste into valuable compost that enriches campus green spaces. To track progress and maintain accountability, Manipal University Jaipur regularly measures and reports on waste generation and recycling rates. Transparency is key in driving continuous improvement and ensuring that the university stays on track to meet its sustainability targets. Engaging the campus community is essential for the success of Manipal University Jaipur 's waste reduction and recycling initiatives. Students and staff actively participate in recycling programs, and student-led sustainability organizations play a vital role in raising awareness and promoting eco-friendly practices.

PROCESS FLOW CHART –STP (350 KLD)



Process description of STP plant

1	**Coarse Screen: -**	Provided to remove screen particles greater than 16 mm.
2	**Fine Screen : -**	To remove any screen particles greater than 6 mm.
3	**Collection Tank: -**	To transfer raw sewage to Oil and Grease Skimmer.
4	**Oil & Grease skimmer: -**	To separate coarse particles and oil & grease respectively.
5	**Equalization tank: -**	Homogenization of the effluent and feed the flow uniformly in secondary process.
6	**Drum Screen / Mini Screen: -**	To separate particles greater than 2mm size before entering to Bioreactor.
7	**Bioreactor tank: -**	Aeration tank is provided with bacterial culture to reduce organic pollutants in presence ofoxygen.
8	**MBR tanks: -**	Provided with Cassettes of membranes to separate water from mix liquid suspended solids.
9	**Sludge holding tank: -**	Wastage sludge stored in to this tank.
10	**Centrifuge: -**	Solid liquid separation of sludge.
11	**Disinfection: -**	HYPO dosing in to treated water discharge line.
12	**Permeate tank: -**	Treated water stored in this tank to supply for Horticulture & Flushing.

Water Reuse from WTP and STP

	Year 2021-22			
	WTP		STP	
	Domestic water in KL		Flush water in KL	
Month	200 KLD (MUJ)	80 KLD (Housing)	150KLD	350KLD
April	5570	1405	180	3464
May	4400	1273	444	3922
June	4366	1226	241	4118
July	3395	1145	152	4736
August	2278	1002	0	4502
September	2746	1216	167	4655
October	2765	1258	139	4040
November	2623	1216	52	4198
December	2974	1212	45	3905
January	3824	1132	15	3765
February	3267	1116	0	3661
March	3073	1184	0	3757
Total	34941	12085	1435	41305
Per month Avg.	3494.1	1208.5	143.5	4130.5

Measuring Food Waste Generation in Manipal University Jaipur

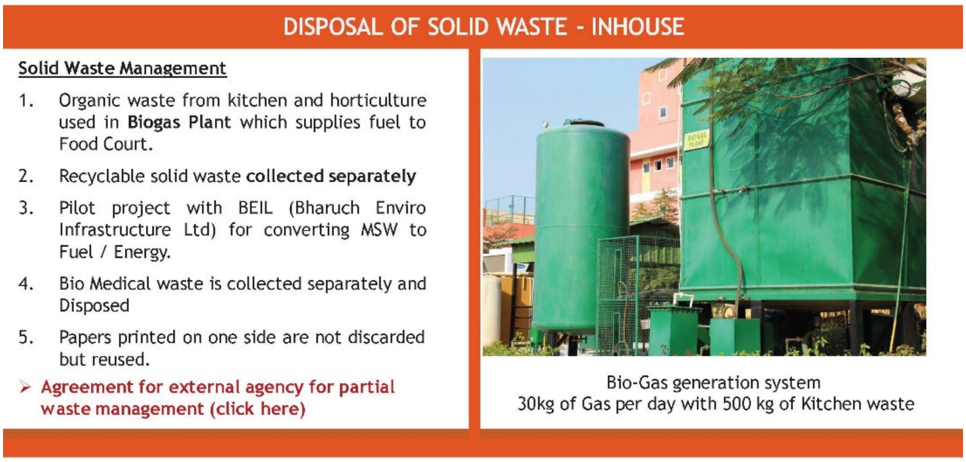
Food waste is a pressing global issue, and universities, with their large dining facilities and diverse student populations, are not exempt from contributing to this problem. Measuring the extent of food waste generated in universities is a crucial step in addressing this issue and promoting sustainability on campus. Manipal University Jaipur quantifies food waste in the institutions.

Manipal University Jaipur has a social responsibility to ensure that food resources are distributed equitably. Reducing waste can free up resources to support food security initiatives and reduce hunger on campus. The significance of measuring food waste in the university has environmental impact, Food waste in university has environmental consequences. Manipal University Jaipur spends significant budgets on purchasing, preparing, and serving food. (Picture1)

Manipal University Jaipur measures food waste, conducting regular waste audits involves collecting and sorting food waste to determine its composition and volume. (Picture 2) This hands-on approach provides detailed insights into what, when, and why food is being wasted. Manipal University Jaipur weighs the food waste generated at various points in the food service process, such as kitchen prep, serving lines, and dining areas. (Picture 3) This data is tracked over time to identify trends and areas for improvement. Manipal University Jaipur employs surveys and innovative technologies like smart bins equipped with sensors to gather real-time data on food waste. (Picture 4) These methods provide a more comprehensive understanding of consumer behavior.

Accurate data on food waste allows Manipal University Jaipur to identify specific areas where waste occurs most frequently. This enables them to implement targeted strategies for waste reduction(Picture 5, 6, 7). By reducing food waste, Manipal University Jaipur can work efficiently on purchasing and disposal costs, making dining operations more financially sustainable. Measuring food waste aligns with the university's commitment to sustainability, helps in reducing Manipal University Jaipur's environmental footprint and meet sustainability goals. The process of measuring and reducing food waste provides educational opportunities for students. It fosters awareness and encourages responsible consumption habits that students can carry forward.

Measuring food waste generated in the university is an essential step towards promoting sustainability, reducing costs, and fulfilling social responsibilities. By employing methods such as waste audits, weighing, tracking, surveys, and technology, Manipal University Jaipur gains valuable insights into their food waste patterns. With this data in hand, Manipal University Jaipur develops targeted strategies to minimize waste, become economically efficient, and contribute to a more sustainable future. Manipal University Jaipur leads by example and inspires the next generation to adopt responsible food consumption practices, and measuring food waste is a key part of that endeavor.

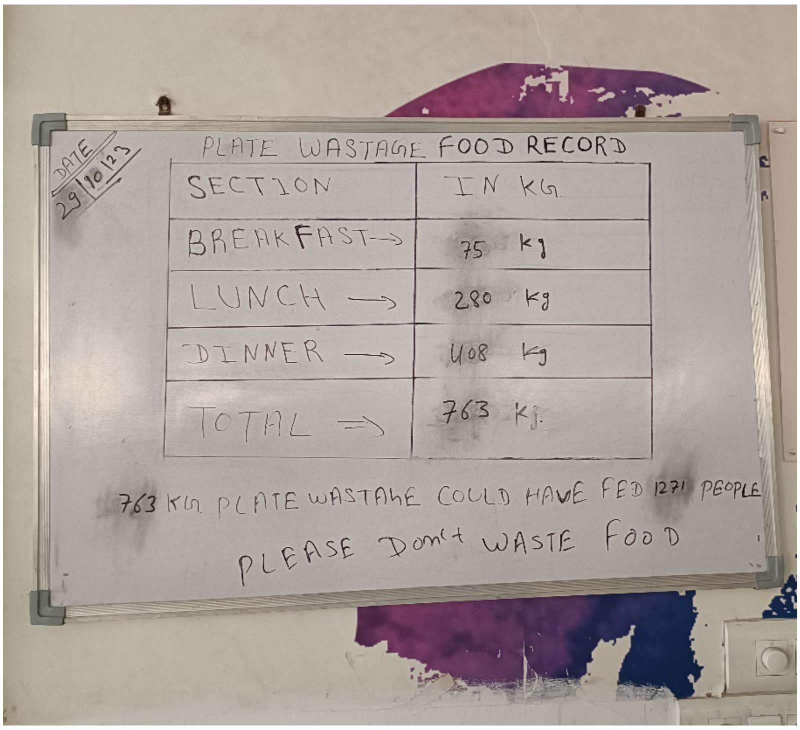


Picture 1: Cold Room for food storage

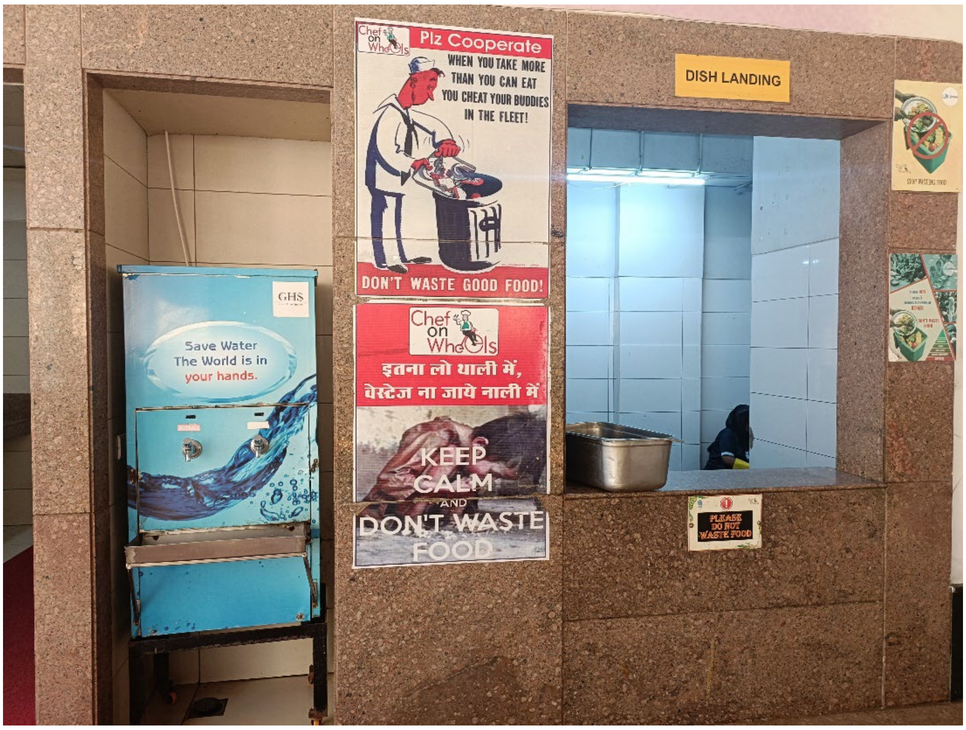
Picture 2: Garbage Segregation in Garbage Segregation Area

Picture 3: Garbage Segregation done at MUJ

Picture 4: Installation of Smart Bins and waste oil tins for scrap and Recyling



Picture 5: Daily food waste measurement in the mess and displayed



Picture 6: Food Waste reduction awareness messages in the MUJ Premises

Picture 7: Food Waste reduction awareness messages in the MUJ Premises

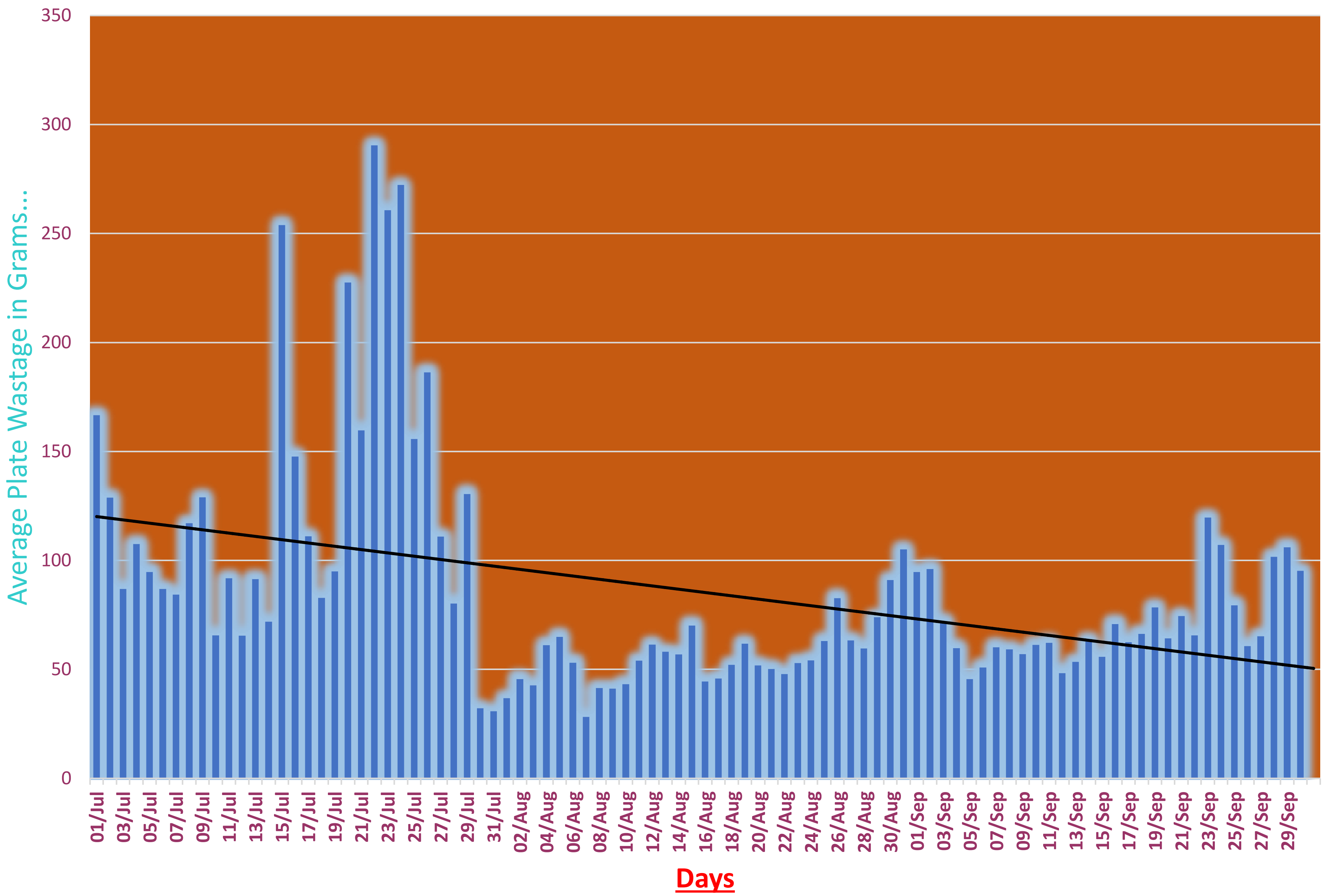
MANIPAL UNIVERSITY
JAIPUR

Date	Student count	Total Weight	wastage average	Date	Student count	Total Weight	wastage average	Date	Student count	Total Weight	wastage average
1-Jul	6500.00	27	0.00	1-Aug	6500.00	266	0.04	1-Sep	6500.00	520	0.08
2-Jul	6500.00	21	0.00	2-Aug	6500.00	364	0.06	2-Sep	6500.00	470	0.07
3-Jul	6500.00	24	0.00	3-Aug	6500.00	310	0.05	3-Sep	6500.00	498	0.08
4-Jul	6500.00	30	0.00	4-Aug	6500.00	456	0.07	4-Sep	6500.00	567	0.09
5-Jul	6500.00	27	0.00	5-Aug	6500.00	371	0.06	5-Sep	6500.00	460	0.07
6-Jul	6500.00	24	0.00	6-Aug	6500.00	379	0.06	6-Sep	6500.00	489	0.08
7-Jul	6500.00	23	0.00	7-Aug	6500.00	238	0.04	7-Sep	6500.00	455	0.07
8-Jul	6500.00	24	0.00	8-Aug	6500.00	342	0.05	8-Sep	6500.00	586	0.09
9-Jul	6500.00	29	0.00	9-Aug	6500.00	346	0.05	9-Sep	6500.00	491	0.08
10-Jul	6500.00	21	0.00	10-Aug	6500.00	378	0.06	10-Sep	6500.00	519	0.08
11-Jul	6500.00	27	0.00	11-Aug	6500.00	386	0.06	11-Sep	6500.00	627	0.10
12-Jul	6500.00	21	0.00	12-Aug	6500.00	410	0.06	12-Sep	6500.00	476	0.07
13-Jul	6500.00	30	0.00	13-Aug	6500.00	343	0.05	13-Sep	6500.00	567	0.09
14-Jul	6500.00	22	0.00	14-Aug	6500.00	379	0.06	14-Sep	6500.00	581	0.09
15-Jul	6500.00	66	0.01	15-Aug	6500.00	466	0.07	15-Sep	6500.00	480	0.07
16-Jul	6500.00	35	0.01	16-Aug	6500.00	421	0.06	16-Sep	6500.00	542	0.08
17-Jul	6500.00	34	0.01	17-Aug	6500.00	445	0.07	17-Sep	6500.00	505	0.08
18-Jul	6500.00	28	0.00	18-Aug	6500.00	471	0.07	18-Sep	6500.00	568	0.09
19-Jul	6500.00	36	0.01	19-Aug	6500.00	574	0.09	19-Sep	6500.00	604	0.09
20-Jul	6500.00	76	0.01	20-Aug	6500.00	494	0.08	20-Sep	6500.00	611	0.09
21-Jul	6500.00	61	0.01	21-Aug	6500.00	588	0.09	21-Sep	6500.00	671	0.10
22-Jul	6500.00	79	0.01	22-Aug	6500.00	497	0.08	22-Sep	6500.00	689	0.11
23-Jul	6500.00	79	0.01	23-Aug	6500.00	577	0.09	23-Sep	6500.00	924	0.14
24-Jul	6500.00	107	0.02	24-Aug	6500.00	551	0.08	24-Sep	6500.00	906	0.14
25-Jul	6500.00	76	0.01	25-Aug	6500.00	614	0.09	25-Sep	6500.00	716	0.11
26-Jul	6500.00	98	0.02	26-Aug	6500.00	600	0.09	26-Sep	6500.00	601	0.09
27-Jul	6500.00	106	0.02	27-Aug	6500.00	551	0.08	27-Sep	6500.00	630	0.10
28-Jul	6500.00	125	0.02	28-Aug	6500.00	563	0.09	28-Sep	6500.00	929	0.14
29-Jul	6500.00	295	0.05	29-Aug	6500.00	562	0.09	29-Sep	6500.00	963	0.15
30-Jul	6500.00	155	0.02	30-Aug	6500.00	533	0.08	30-Sep	6500.00	771	0.12
31-Jul	6500.00	211	0.03	31-Aug	6500.00	500	0.08			0	
Grand Total	**201,500.00**	**2,017.00**	**0.31**	**Grand Total**	**201,500.00**	**13,975.00**	**2.15**	**Grand Total**	**195,000.00**	**18,416.00**	**2.83**

MANIPAL UNIVERSITY JAIPUR

INSPIRED BY LIFE

Daily Wise Average per Plate Wastage



SOP –KST

PURPOSE: To establish a procedure for housekeeping (KST) activities.

SCOPE: The scope of KST activities is as follows:

a) KST Manpower

b) Handling of KST consumables

c) Premises Cleaning

d) Garbage Management

RELEVANT STAKE HOLDERS:

S.No.	Process Step	Responsibility	Authorized by
1	Preparation of Duty Roaster	KST Head	Unit Head/ Unit Chef
2	Preparation of Cleaning Schedule	KST Supervisor	Unit Chef
3	Maintenance of Chemical stock and Equipment	KST Supervisor	KST Head
4	Chemical Dilution	KST Supervisor	FSMS Head
5	Segregation of waste	KST Supervisor	Unit chef

PROCEDURE

a) KST Manpower

- The duty roaster is made by the KST supervisor by considering the intensity of operation in each area.
- Shift supervisor shall take a small briefing for all of his team members in the beginning of the shift and explain the roles, do's & don't to be followed on the day.
- KST supervisor checks the personal hygiene of all the employees before beginning of the shift and the same is recorded in the personal hygiene checklist.
- The supervisors shall provide the necessary PPEs like aprons, gloves, hair nets, face masks (if required) to each staff.

b) Handling of KST consumables:

- As per the requirements, the KST supervisor shall fill the store requisition slip (SRS) with the details of items required for a day.
- The indent shall be signed by the KST head/unit head/unit chef and is sent to the store department for issuing of the material.
- A KST personnel shall receive the items from store and acknowledge the same.
- All the chemicals & KST items issued shall be kept in segregated area, separate from the production area, under lock and key to prevent misuse and mishandling.

- Supervisor is responsible for maintaining stock and controlling the receiving and issuing of the items which shall be recorded.
- Material Safety Data Sheet (MSDS) for all chemical being used in the premises needs to be displayed in a designated area of the unit.
- Awareness of MSDS shall be taken care in the chemical usage training.

c) Premises Cleaning

- Dilution of the chemicals are done and monitored by the shift KST supervisor and the consumption is recorded.
- The chemicals are diluted and kept separately away from the food.
- A cleaning schedule shall be developed at site and the same is been followed & recorded.
- The deep cleaning of the kitchen is done at least once in a week and recorded in the kitchen cleaning schedule record.
- The team shall monitor the rood-box and gum traps daily and replace if needed and any pest spotted is recorded in the pest sighting checklist.
- KST supervisor shall monitor the pest control activity and ensures the activities are happening as scheduled.
- Post pest control activity the premises is thoroughly washed within recommended time to remove the used chemicals.

Garbage disposal:

- Specific areas shall be assigned for placing dustbins. The dustbins to be always kept in closed condition with its lids.
- Garbage shall be removed from each dustbin frequently when its 3/4th filled and placed in the assigned garbage room until it's lifted by the garbage vendors.
- Wet and dry garbage shall be stored separately so that there is no cross contamination between both.
- Wet garbage clearance depends on the local municipal guidelines
- After it is cleared the garbage room has to be cleaned daily using suitable chemicals and air dried before use.
- The contact details of local municipal garbage clearance team to be made available. Supervisors /Unit heads to ensure that the wet wastes are cleared within 24-36 hours.
- If there is any deviation/delay in collecting the garbage's from the garbage collector same to be recorded with proper reason.

Scrap waste handling

Si no	**Common types of Scrap items generated usually includes**
1	Carton boxes part of bulk packing, recyclable plastic like milk packets etc
2	Empty oil tins
3	Glass items/Bottles
4	Scrap metal utensils/Equipment

- Specific areas to be assigned for placing scrap waste generated and should be away from production premises.
- These scarps should not be placed within the production premises.
- A vendor to collect these scrap items to be identified and assigned considering the geographical limitation and non-availability of scrap vendor operation team shall initiate and assign the scrap vendor locally who would visit as per the requirement needed i.e. or call service. It shall be documented in a book/register with suitable approval from management.
- The unit chef/unit head to decide the frequency of scrap clearance based on the volume of production/purchase scrap accumulated across the individual QFS units.
- In general scrap shall are cleared at least twice a month.
- If there is delay in collecting the scrap from vendor, the supervisor shall do a follow up on the same.
- Cleanliness of assigned scrap area to be well maintained and cleaned regularly to ensure that the area doesn't become a breeding place for pests and rodents.
- Asset management approval to be taken if any equipment /asset of QFS to be moved out as scarp when the machine/equipment can no longer be repaired/rectified.

Records

Format/ Record name	**Format number**	**Responsible**
Cleaning of chiller	QFS/HC/KST/01	KST Supervisor
Cleaning of Freezer	QFS/HC/KST/02	KST Supervisor
General cleaning – Floor/Ceiling	QFS/HC/KST/03	KST Supervisor
Deep cleaning - Kitchen/Production	QFS/HC/KST/04	KST Supervisor
Deep cleaning - Pot wash	QFS/HC/KST/05	KST Supervisor
Grooming Checklist	QFS/HC/KST/06	KST Supervisor
Garbage clearance	QFS/HC/KST/07	KST Supervisor
Chemical Usage Record	QFS/HC/KST/08	KST Supervisor

MANIPAL UNIVERSITY JAIPUR

Details of E-Waste management at MUJ

Electronics waste, commonly known as e-scrap or e-waste, is the trash we generate from surplus, broken, and obsolete electronic devices. Electronics contains various toxic and hazardous chemicals and materials that are released into the environment if we do not dispose of them properly. E-waste or electronics recycling is the process of recovering material from old devices to use in new products.

According to **MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE GOVT. OF INDIA** Gazette G.S.R. 472(E), dated the 10th June, 2015 Notification MUJ has been classified as bulk consumer. MUJ has implemented process and framework to identify all end of life/obsolete products. A committee is constituted by management to scrutinize the final product list marked as e-waste and approve the recycling. For recycling MUJ has given contract to Adinath **Recyclotronix Pvt. Ltd. (ARTRONIX) Panipat, Haryana.** As per schedule 1 of notification e-waste at MUJ comes in category **Information Technology and Telecommunication Equipment.** Following items are applicable to e-waste at MUJ Campus:

Sr. No.	**Categories of electrical and electronic equipment**	**Electrical and electronic equipment code**
i.	**Information technology and telecommunication equipment:**	
	Centralized data processing: Mainframes, Minicomputers	ITEW1
	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2
	Personal Computing: Laptop Computers(Central Processing Unit with input and output devices)	ITEW3
	Personal Computing: Notebook Computers	ITEW4
	Personal Computing: Notepad Computers	ITEW5
	Printers including cartridges	ITEW6
	Copying equipment	ITEW7
	Electrical and electronic typewriters	ITEW8
	User terminals and systems	ITEW9
	Facsimile	ITEW10
	Telex	ITEW11
	Telephones	ITEW12
	Pay telephones	ITEW13
	Cordless telephones	ITEW14
	Cellular telephones	ITEW15
	Answering systems	ITEW16

Annexure:

1. **Copy of partner's/collector's registration certificate with govt.**
2. **E-waste Inventory Copy**
3. **E-waste Tax Invoice**
4. **E-Waste Refund**
5. **E-waste Policy**

Adinath RecycloTRONIX Pvt.Ltd.

A Technical Approach Towards Ecological Balance

Plot # 361, Industrial Estate, HSIIDC, Panipat (132103), Haryana
E-mail: info@artronix.in
Website: www.artronix.in
Contact #: +91-98969-92399

ARTRONIX®

CIN: - U37100HR2016PTC064367

Haryana State Pollution Control Board Authorization No.HSPCB/2020/7469817EWREF00

DATA DESTRUCTION AND DISPOSAL CERTIFICATE

Date : 15/12/2020 **Certificate Number:** ART/101002

ADINATH RECYCLOTRONIX PVT. LTD. DIRECTOR

Supplier Name: MANIPAL UNIVERSITY, JAIPUR

Supplier Address: VPO Dehmi Kalan, Off Jaipur- Ajmer Expressway

This is to certify that all the Waste Electrical & Electronic Equipment (WEEE) collected from your premises as on below mentioned date has been completely dismantled and recycled in our recycling facility.

Please refer below details of the scrap lifted from your premises:

Scrap details (Ref. attached excel document no.)	Dated	Quantity (Kgs)
e-waste disposal UV-6	19/11/2020	APPROX 550 KGS

We certify that all the above listed equipment has been recycled in an environmentally friendly manner and are in accordance with our organization's safe and secure data destruction policies.

NOTE: All the recycling techniques and measures are in accordance with Central/State Pollution Control Board norms.

ADINATH RECYCLOTRONIX PVT. LTD. DIRECTOR

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Authorised Signatory
For Adinath Recyclotronix Pvt. Ltd.
Panipat

E-WASTE DISPSAL UV-6

S. NO.	DEVICE TYPE	ITEM DESCRIPTION (MAKE/ MODEL)	QUANTITY	SERIAL NO(S). OF THE UNIT	CONDITION	YEAR OF PURCHASE
1	UPS	Computer UPS	4		Scrap	
2	TV	LED TV 42 inch	4		Scrap	
3	SWITCH	Super Stack 24 Port Switch	4		Scrap	2011
4	PROJETOR	NEC M420XG	1	2740185UG	Scrap	2012
5	PROJETOR	NEC M420XG	1	2840147UG	Scrap	2012
6	PROJETOR	NEC M420XG	1	2940183UG	Scrap	2012
7	PROJETOR	NEC M420XG	1	2940156UG	Scrap	2012
8	PROJETOR	NEC M420XG	1	2740165UG	Scrap	2012
9	PROJETOR	NEC M420XG	1	3740045UH	Scrap	2012
10	PROJETOR	NEC M420XG	1	2840135UG	Scrap	2012
11	PROJETOR	NEC M420XG	1	2840142UG	Scrap	2012
12	PROJETOR	NEC M420XG	1	3740071UH	Scrap	2012
13	PROJETOR	NEC NP-V260G	1	1440129EA	Scrap	2012
14	PRINTER	Toshiba Studia 212	1	CJF266632	Scrap	2012
15	PRINTER	Toshiba Studia 225	1	C3J270501	Scrap	2012
16	PRINTER	Toshiba Studia 212	1	C6A223695	Scrap	2012
17	PRINTER	RISO KS 800	1	NO	Scrap	2012
18	PRINTER	Ricoh SP 111	1	T984M440337	Scrap	2015
19	PRINTER	Ricoh SP 111	1	T984M340027	Scrap	2015
20	PRINTER	Ricoh SP 111	1	T984MB42336	Scrap	2015
21	PRINTER	Ricoh SP 111	1	T984M440130	Scrap	2015
22	PRINTER	Ricoh SP 200s	1	T794M201305	Scrap	2015
23	PRINTER	HP 1536 DNF	1	CNB9B8JC83	Scrap	2013
24	PRINTER	HP M1213	1	CNG9C2T932	Scrap	2011
25	PRINTER	Ricoh SP 111	1	T984MB42639	Scrap	2015
26	PRINTER	Ricoh SP 111SU	1	T944M740320	Scrap	2015
27	PRINTER	Ricoh SP 111	1	T984M742006	Scrap	2015
28	PRINTER	Ricoh SP 111	1	T984BB42311	Scrap	2015
29	PRINTER	Ricoh SP 111	1	T984M640922	Scrap	2015
30	PRINTER	Ricoh SP 111	1	T984MB42335	Scrap	2015
31	PHONE	Phone	4		Scrap	2011
32	Accessories	Printer Cartidge	50+		Scrap	
33	Accessories	Laptop Battery	50+		Scrap	
34	Accessories	Computer UPS Battery	3		Scrap	
35	Accessories	Mouse	20		Scrap	
36	Accessories	Mother Board	2		Scrap	
37	Accessories	Cartridege DRUM @Roller	2		Scrap	
38	Accessories	SMPS	4		Scrap	
39	Accessories	Laptop Bags	100+		Scrap	

recycled & disposed.

15/12/2021

RECYCLOTRON PVT. LTD. DIRECTOR

BIO-Urja System Processflow Description

Introduction

This document defines the standard operation procedure for the Bio-Urja system, a bio-methanation system installed by GPS Renewables Pvt Ltd.

The bio-methanation system is a high throughput digestion system operating on the food waste feed stock. The gas produced is used daily for the cooking needs in kitchen where GPS burners have been installed.

Digestion Process

Input of the system consists mainly of food waste and vegetables. This input is fed into the shredder and is mixed uniformly with the slurry (from the reactor/digester) and is pumped into the reactor/digester by using a pump.

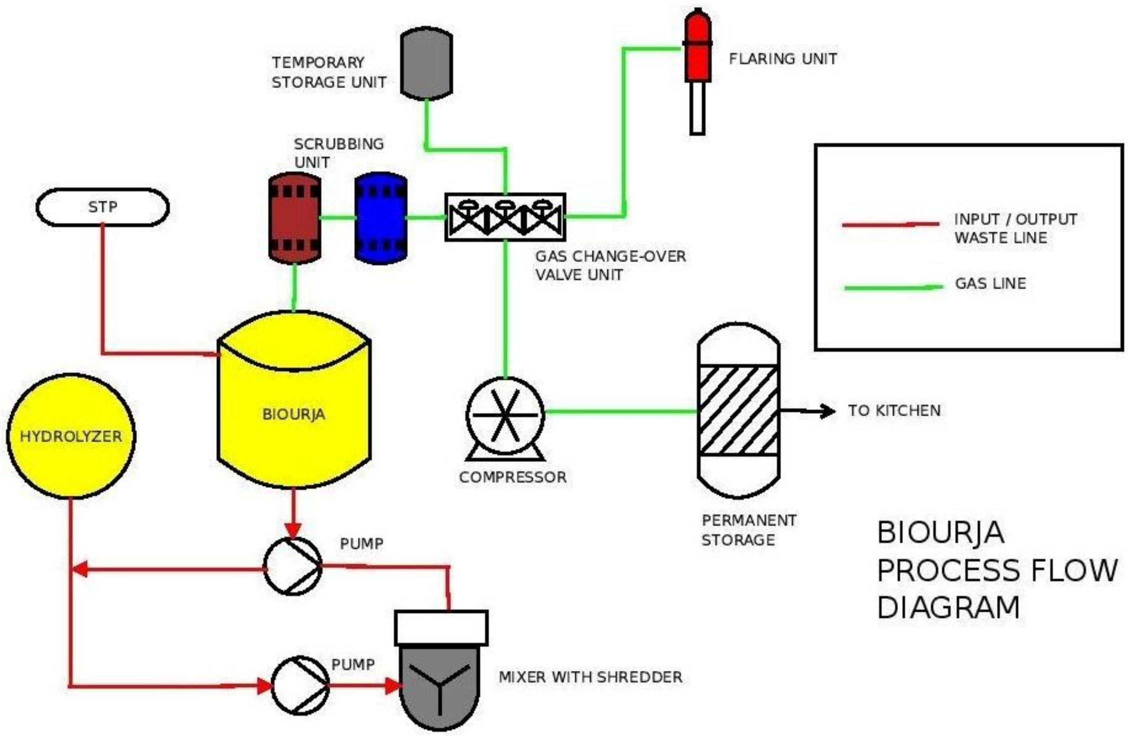
A temperature of 39 degree Celsius is maintained by using temperature controller, geyser, little pump and coil (coil is fixed inside the reactor). Once the food waste is fed into the reactor, the anaerobic digestion takes place and it gets bio-methanaised as a result of which biogas is formed.

This biogas contains water content, H_2S, CO_2 and methane. To separate the impurities (Water, H_2S and CO_2) this gas is passed through a water scrubber, H_2S scrubber and air filter. From here the biogas is stored in a temporary storage balloon and when the balloon is full; this biogas is compressed and stored in a pressure vessel by using a compressor. Biogas is piped from the pressure vessel to the kitchen. Through specialized burners biogas is used for cooking.

Components

1) Shredder and Mixing Unit
2) Transfer Pump
3) Hydrolyser Tank with Screw Pump
4) Digester
5) Scrubbers
6) Valve Box
7) Balloon Cage
8) Compressor
9) Gas Pressure Vessel
10) Flaring Post

Process Flow Diagram



Shredder & Mixing Unit:

This unit comprises of a shredder and a mixing tank.
The function of the shredder is to chop the food waste up to size digestible by the Digestion unit.

Pump:

This unit is generally used to transfer the shredded waste into the Digestion unit and hydrolyser unit.Thepump is a submersible pump with cutter arrangement for ease flow of shredded food waste and also screws pump to pump the waste from hydrolyser to digester.

Hydrolysis Tank with Screw Pump:

The first stage of the Bio-Methanization process called the 'Hydrolysis' happens in this tank, the daily loading to this tank need not be maintained constant and the nature of slurry is acidic in this tank.

Digester:

This unit is the processing unit for the remaining 3 stages of Bio-methanization namely acidogenesis, gametogenesis and methanogenesis, following parameters of the slurry in the digester are monitored

1) pH: This is done with an equipment called the "Auto Titrator", which automatically titrates the slurry sample and the results of the titration determines the pH, acidity and alkalinity of the slurry.
2) Temperature: The Methanogenic bacteria are thermophilic and the slurry temperature is maintained between 39 – 42 deg Celsius, this is maintained with the help of an Heating system which comprises of the following component
   a) Geyser
   b) Heating Coil
   c) Circulating Pump
   d) Temperature Sensors

Scrubbers:

Biogas produced generally comprises of Methane, Water vapour, Hydrogen Sulphide and Carbon Dioxide, following scrubbers are used in our system:

1) **H2o Scrubber**: This scrub is used to scrub the water vapour present in the gas, it generally consists of an empty sealed tank, the scrubbing happens due to Temperature difference.
2) **H2S Scrubber**: This unit is used to scrub hydrogen sulphide, the unit is filled with iron filings which has the capability to adsorb sulphide present in hydrogen sulphide.

Valve Box:

This unit controls the flow of gas from the scrubber to the final storage that is pressure vessel, it comprises of the following:

1) Change Over Valve : This valve is used to control the temporary storage(Balloons) and compression

2) Flaring Valve: This valve is used to automatically flare the excess gas produced, the flaring valve is actuated when the gas pressure vessel is completely filled or during the event of a power failure.

Balloon cage:

This is a temporary storage for gas which consist of one balloon of 1cum capacity, the balloons is the input for the compressor, the quantity of gas produced and flow rates can be determined by the number of balloons compressed.

Compressor:

The gas filled in the balloons are compressed to the required pressure and stored in the Gas pressure vessel. The compressor is automatically triggered as and when the balloon reaches the required pressure with help of a pre-set programming.

Gas pressure Vessel:

This is the final storage unit for the gas and the reservoir for distribution to the required utility, it consist of a pressure sensor which senses the pressure in the pressure vessel which in turn decides the operation of compressor and the flaring unit.

Flaring Unit:

The excess gas is burnt/flared through this unit, it generally consist of ignition rods which is automatically actuated as and when the flaring valve is open, it generally acts as an exhaust for he system.

As part of our E-waste policy, we have recycled following electronic items shown in below table:

Item	Year of Make	Qty.	Year Recycled
Lenovo Think Centre	2011	40	2022
Hp Desktop 3330	2013	26	2022
Hp Desktop 400	2016	1	2022
Hp Desktop 202 G1	2015	1	2022
HP Z210	2014	2	2022
HP Laserjet Printers	2014	3	2022
Ricoh Sp 203 SF	2014	1	2022
Laptop Battery		25	2022
NEC Projector		35	2022
Lenovo Laptop	2011	20	2022
Laptop Acer	2012	12	2022
HP Probook 4440s	2013	20	2022
IP Phone 3905		25	2022
Toner		20	2022
Ricoh SP 111 Printer		1	2022
HP 1005		1	2022