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Generation of Electricity by Sewage and Food Waste

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Abstract: *There has been a increase in sewage and food waste generation in India. In the last few decades because of rapid population growth and economic development in the country. In this study pre performance of the biomass to produce power. Sewage and food waste are chosen as to study and produce biogas under certain conditions. By which biogas production enhances and purify, leading to a high power generation. Wastewater that has been adversely affected in quality of water in the river . During recent years, there has been people are concern about water and their use, conservation of water all over the world. It has been observed that sewage water is directly supplied to the river. Sewage and food waste can be for generation of electricity form gas and remaining of biomass can be used for manure.*

Keywords: *Treatment process, food waste, biogas, manure, electricity generation.*

I. INTRODUCTION

We can generating huge amounts of power from sewage and food waste. The process is fairly simple sewage and food waste to produce a fuel called biogas under ambient condition. Biogas is methane, and so is natural gas, so the two are essential interchangeable. India has recognized as has having a major problems with water Pollution, due to untreated Sewage. Rivers like the Ganges, the Yamuna flowing through highly populated areas, gets polluted. The wastewater treatment plant or sewage treatment plant is necessary. A great amount of attention has been paid to anaerobic digestion of sludge from wastewater treatment plants to pursue two goals; handling of the sludge in a harmless way for the environment and producing more biogas (mainly methane and carbon dioxide). The produced biogas is a renewable energy that can be used as a fossil for vehicle fuels also for production of methane gas and electricity.

Food waste is an energy that mostly ends up rotting in landfills, there by releasing greenhouse gases into the atmosphere. There are ways to tackle the growing problem of food waste except to transport it on trucks all the way up to the dumping sites. It stenches, pollutes the environment, attracts birds, poisons the groundwater and makes the neighbourhood's a living hell. By using the anaerobic digester produced biogas is a renewable energy source that can be used as a fuel for cooking and electricity.

A. AIM

Use sewage and food waste for the generation of electricity from biogas in treatment plant. The remaining of waste generated can be used for manure for farming

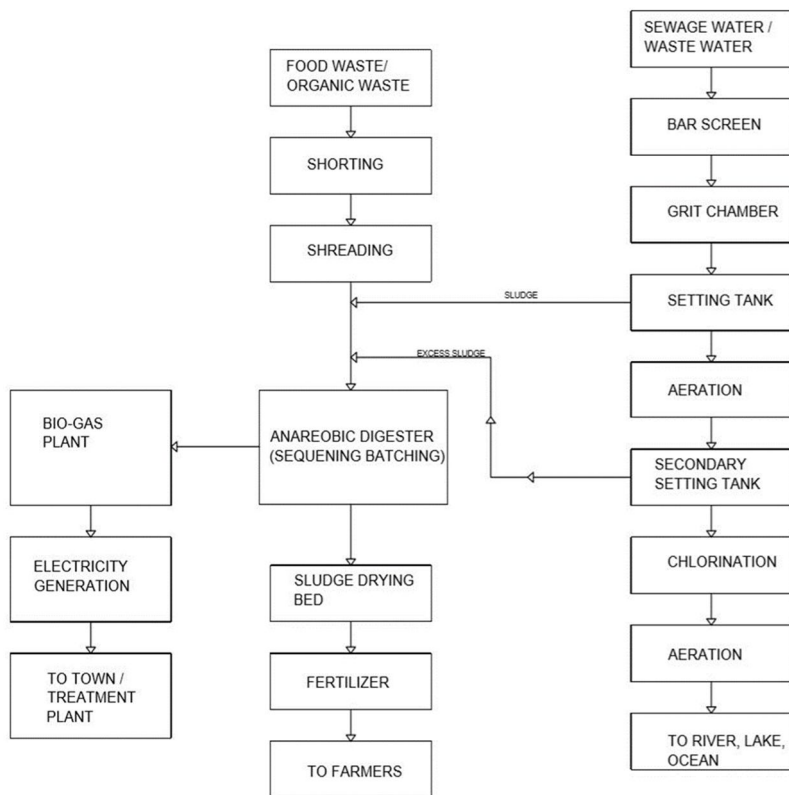
II. PROBLEMS

India is known as having major problems with water Pollution, due to untreated Sewage water. Rivers flowing through highly populated areas gets polluted can affects aquatic animals. 75% of sewage in India is untreated and flows directly into the main rivers, polluting the main sources of drinking water. Indian cities produce nearly 42,000 million litres of sewage every day and barely, making 21 percent of it is treated. Hence treatment of sewage and its reuse is need frequently



The UN's Food and Agricultural Organisation (FAO) reports that roughly one third of the food produced in the world for human consumption every year, approximately 1.3 billion tonnes, gets lost or wasted. A staggering statistic considering that roughly one in nine people in the world do not have enough to eat, according to The Hunger Project.

III. PROCESS OF TREATMENT PLANT



A. Advantages

- 1) Reduce waste water pollution.
- 2) Aquatic animal are safe by the help of treatment process.
- 3) Sustainable and environmentally friendly.
- 4) Reduce fertilizers and pesticides.
- 5) Generation of electricity by bio-gas, generated from treatment plant.
- 6) Prevents land fills

B. Disadvantage

- 1) Funds should be available to construct treatment plant
- 2) Skilled labours are required
- 3) Maintenance is required
- 4) Area should be available

IV. RESULT AND DISCUSSION

The main components of waste management are collection, segregation, storage, transportation, treatment and disposal. Waste segregation at source is the most important step in waste management and is done in two major categories: wet waste and dry waste. Wet waste is the bio degradable. Waste segregation was made mandatory by Hon. Supreme court and Govt. of India Gazette dated 3rd October 2001 and Municipal solid waste management and handling rules 2000. PMC has implemented solid waste segregation system for dry and wet waste in the city. The corporation has started collection of only segregated waste from households which have forced the residents to segregate the waste. From the total waste generated about 500 Metric Tons dry waste is separated and removed by various agencies like rag pickers, crap material vendors and other NGOs. These rag pickers are

segregating waste at various sources like from door step collection, ghantagadi, municipal containers and at the dumping site. There are more than 5100 registered rag pickers involved in this waste segregation process. PMC has done ground truthing in 14 administrative areas regarding solid waste segregation practice in six categorized places namely Areas, Properties, Societies, Bungalows, Slums & Chawls and Hotels & Restaurants (Table 1). Among these except hotels industry, other categories have poor performance in segregation of waste at source.

Total Waste Segregated	50% to 54 %
Areas	25 % to 65 %
Properties	43%
Societies	31%
Bungalows	46%
Slums & Chawls	31%
Hotels & Restaurants	84%

Table. 1: segregation of food waste

A. Wet Food Waste Collected Through Hotel Trucks

PMC has deployed 30-40 separate trucks for collection of hotel waste (Table 2), which is segregated at source.

Sr. No.	Name of area	Trucks	Hotel	Weight of wet waste (In Kg)
1	Aundha	3	78	9200
2	Ghole Road	2	219	22500
3	Nagar Road	4	119	9500
4	Dholepatil Road	4	180	18600
5	Warje Karvenagar	2	87	7200
6	Kothrud	3	118	11200
7	Sangamwadi	2	37	7200
8	Sahakar Nagar	3	89	5200
9	Dhankawadi	3	98	4000
10	Bibwewadi	2	47	3700
11	Tilak Road	3	49	6130
12	Bhavani Peth	3	110	5840
13	Kharadi	3	150	6400
14	Hadapsar	4	52	7500
	Total	40	1409	1,30,000

V. VISITS

A. Aundh Biogas Plant



Biogas generator



Food waste shredder



Aerobic digester

VI. CALCULATION OF ELECTRICITY FROM BIOGAS

(ASSUMPTION)

Total waste generated from the areas – 1,24,370 Kg

The biogas generated – 7461 Cum/day

Electricity generated (biogas) – 1500kVA-3000Kva

VII. CONCLUSION

Cities with larger populations generally rely more on surface water than ground water. In cities where ground water is the source of water supply, aquifers are getting depleted due to over extraction. At the same time, sanitation has not kept pace with water supply in the country. Human health and economic prosperity are very much dependant on clean water supply and good sanitation as on other factors. Hence it is important to look at how pollution of water sources, especially from sewage, affects water quality and water security.

In this paper studied that, the waste generated from sewage treatment plant and by food waste Treatment plant has capacity of 110 MLD and discharge clean and treated from different areas. As per table. 2. The wet waste collected in different areas total waste generated was 1,30,000 (In Kg). The electricity generated 150kVA. Digested sludge from anaerobic digester is dried in Sludge drying bed and it can be used for organic fertilizer at low cost. Farmers can get organic fertilizer at low cost and reduce chemical fertilizers from market.

VIII. FUTURE EXPANSION

Like almost all urban areas, Pune's sewage management disposal reduces. In a recent Public Interest Litigation filed against Pune Municipal Corporation (PMC) in National Green Tribunal (NGT) for failing to control water pollution in Mula Mutha. Rivers it was revealed that several crucial details regarding sewage generation and disposal in Pune city remain unknown even to PMC. PMC failed to furnish even the basic details like present and future generation of domestic sewage (from 2022- 2025), present handling capacity and performance of STPs for six months.

The waste sludge can be used to generate huge amount of energy. By that energy electricity is generated, this electricity can be useful for treatment plant and supply the surrounding area. There will be no wastage of waste will occur.

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