

SIMULTANEOUS MANAGEMENT OF SOLID AND SEWAGE WASTES



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AUTHOR AFFILIATION:

1st Author: Durga.V

III-EEE-“A”

Sri Sairam Engineering College

Mail id: durgayazhini98@gmail.com

2nd Author: Magarajeswari.R

III-EEE-“A”

Sri Sairam Engineering College

Mail id: magarajeswari@gmail.com

3rd Author: Rajeswari Jayakumar.

III-EIE-“A”

Sri Sairam Engineering College

Mail id: rajeswarijkumar@gmail.com

4th Author: Subathra.B

III-EIE-“C”

Sri Sairam Engineering College

Mail id: subadhrabalasubramanian@gmail.com.

ABSTRACT:**Aim:**

To handle the solid and sewage waste in an efficient manner at a faster pace in India.

Materials and methods:**Materials required:**

Wastes separators.

Incinerator.

Carbon negative power plant.

Amine solution.

Transmission path: for heat transmission from incinerators to carbon plants.

Methods:

Power production by anaerobic digestion: Sewage wastes collected and stored in a place and treated. By anaerobic digestion of sewage wastes methane gas is produced which is used for power production.

Incineration: is the method of complete combustion of solid wastes and as a result of this process we get heat which could be used for heating of water in power plants.

Conversion of CO₂ to negative carbon: is one method by which the atmospheric carbon is collected and stored which after a time turns into negative carbon which is used to treat the atmosphere.

Using CO₂ for growing vegetables: is a challenging and remarkable try in the recent times. Collecting Carbon from the atmosphere (with the help of waste heat from incinerators) and sending to greenhouse gas plants to grow plants.

Results:

Carbon emissions could be considerable reduced.

Dumping of solid wastes in huge mass could be prevented.

Environmental prevention could be better.

Large landmass could be reused for various purposes.

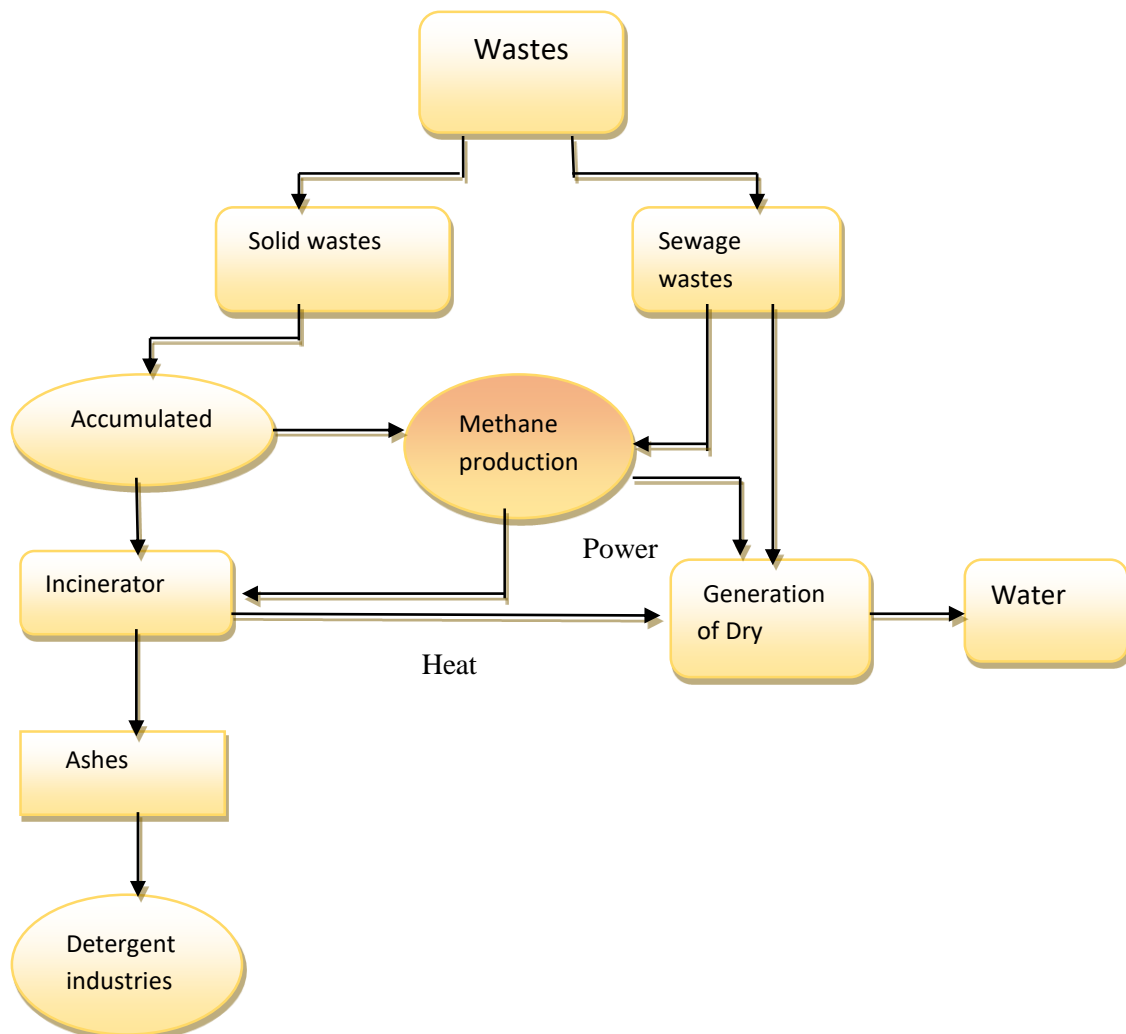
Conclusion:

Countries like India, China generate a lot of solid and sewage waste every year. This is the main problem faced. In these countries if this technique it could be a huge success. Even though it has a lot of practical difficulties like high cost and maintenance issues it is a onetime investment and could serve us for a longer period of time.

INTRODUCTION:

The most important crisis faced by the world today is environmental pollution and the main reason for this problem is accumulation of wastes in different forms. Specifically handling of non-biodegradable wastes is not done in a significant pace. Simultaneous handling of solid and sewage wastes and producing power from it could be a solution to this issue to a certain extent. This method could be much better than landfills as the accumulation of wastes is prevented to a larger extent.

WORKING BLOCK DIAGRAM



MATERIALS AND METHODS:

DISCUSSION:

- Management of wastes:

This process involves a series of stages and they are explained as follows:

- Separation of solid wastes:

This process first starts within the household levels. The waste generated in the house must be separated as biodegradable and non-biodegradable. These wastes are further collected to be processed. The biodegradable waste is sent to the manure generation industries. This non- bio degradable wastes is treated as follows.

Sewage wastes:

The sewage wastes generated are directed to the plant where they are stored for a particular period of time and stirred at regular intervals. After a certain period of time Methane gas is being released. This Methane gas initiates the power production.

- Power Production:

The sewage wastes should be collected and treated with micro-organisms. As they are treated anaerobic digestion occurs and as a result we get sewage gas or methane gas. This sewage or methane gas is used for power production. The efficiency of power generated from Methane is much better than the common methods. This power is used as the supply for the incinerator.

- Incineration:

Incineration is complete combustion of solid wastes at a high temperature range of **1000 °C-1,500 °C** and reducing the volume of solid wastes by up to 80%. As a result of this incineration a large amount of heat and a certain amount of ash is released. This heat is used for collection of CO_2 from the atmosphere. Mostly rotary kiln incinerators are used.

- CO_2 handling:

CO_2 can be treated in many ways. But the most innovative and efficient way of treating are as follows:

- By converting the CO_2 into negative carbon and treating the atmospheric carbon:

This technique was first introduced in Oslo, Norway. By this technique the heat generated from the incinerator is used for collection of CO_2 from atmosphere. This CO_2 stored in a plant for specific period of time under certain conditions of temperature and pressure and then treated with **Amine solution**. Amine solution also absorbs carbon from flue gas. This amine solution with captured CO_2 is sent to absorber so that it is heated and converted into negative carbon. This negative carbon which could be used to treat the atmospheric carbon levels and reduce the rate of pollution.

- By sucking CO_2 and grow vegetables:

This technique is currently implemented in Zurich, Switzerland by Climeworks Company. By this technique we could suck the CO_2 from the incinerator by a method called “Direct Air Capture” and are collected in large boxes. The gases collected are filtered so that we get a pure form of CO_2 which could be used to increase the plant growth rate by 20%. Plants

absorb CO₂ during photosynthesis which would take a specified amount of time. But as CO₂ is being supplied by pipes externally the time taken for photosynthesis and hence the growth of plants are increased by a rate of 20%.

- Ash Handling:
- The ashes from the incinerator can be effectively used as fertilizers in agricultural lands. This significantly makes the soil rich in nutrients and reduced levels of chemical contents. Also it could be used for pest control.
- It could be used for algae control in water bodies.
- It could be used to unclog the drains.
- It could be used for polishing metals like silver.

CONCLUSION:

As this system deals with the simultaneous management of solid and sewage wastes it could save time and cost in a better way. Every byproducts obtained by this method is used in an efficient manner in different forms. It could solve the world's need in the disposal of wastes. If it could be implemented in upcoming years like India it could be a huge evolution.

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