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Municipal Solid waste Management

[1]Santosh Bhuimbar, [2]Naveen kumar P, [3]Shreenivas
[1][2] Assistant Professor
[1] Girijabai Sail Institute of Technology, karwar,
[2] Sphoorthy engineering college, Hydrebad

Abstract:- **This paper attempts to the Municipal Solid Organic Waste Management (MSOWM) have a major problem are environmental and disposal of MSW in Indian cities, due to rapid urbanization. In MSOW nearly 60-70% vegetable wastes generated and 30-40% plastic wastes. According to survey conducted on Jan – Feb 2015 in Davanagere city nearly daily 120MT MSW generated in that approximately 70–80% MSOW and 20-30% municipal Plastic wastes. To create awareness among the public for generated organic wastes are segregated and use for Biomethanation (Biogas) production and bioethanol and inorganic wastes are segregated and use for biodiesel production.**

Keywords:-- **Biogas, Biodiesel, Bioethanol, Municipal Solid Organic Waste Management (MSOWM), Inorganic Solid Wastes.**

I. INTRODUCTION

One of the major problem faced by the world is municipal solid wastes disposal, due to rapid growth of population and uncontrolled urbanization and market waste is major source of municipal solid wastes and its having organic wastes are vegetable, flowers, leaves, papers and inorganic wastes are plastics, metals, glass. Improper disposal of solid wastes is major problem in our society, production and consumption, quantity of wastes generated [8, 6]. These type of problems are more in developing nations than in developed nations, due to the economic growth as well as urbanization is more rapid. Municipal solid wastes, commonly known as trash or garbage, are the municipal solid wastes generated from different municipalities. Some of these wastes to be extremely toxic and infectious. The uncontrolled and unscientific dumping of such Municipal Solid Wastes have brought about a rising the incidents of hazards to human health. More serious risk to human health due to contamination of surface and ground water. Realizing that we need for proper and scientific management of Municipal Solid Wastes and the Municipal Solid Wastes (Management & Handling) Rules. The environmentally sound management of Municipal Solid Wastes issue have been received to be attention of international and national level policy making bodies and citizens. This necessitates management of solid waste at to be generation, storage, collection, transfer and transport, processing, and disposal in an environmentally sound manner with the good principles of public conservation, health, economics, engineering, aesthetics and environmental considerations and solid waste management includes all financial, legal, planning, administrative, and engineering functions [4].

II. SURVEY ON MUNICIPAL SOLID WASTES

According to survey conducted on Feb 17, 2015 municipal solid waste generated in world 1.2-2.8 billion tons per year, as per the survey 1.3-1.60 Kg per person per day waste generated. Second most population country in the world India is contributes nearly 18% to the population and 2.4% of the world's land area and in India According to the survey Jan 10, 2012 wastes generation rate among metros, class 1 cities, states and north, east, west and south regions of India nearly 10040000 MT per day and per capita 0.708 Kg per day among all Southern India city generated maximum per person is 600 grams per day. Also India added resources such as food, land, power etc [8]. Which can be difficult to be identified and fulfilled by the government.

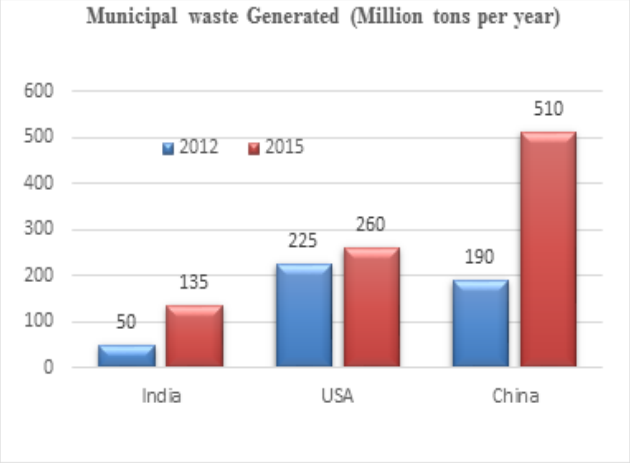

Figure 1: Major MSW generated countries during the year 2012 and 2015.

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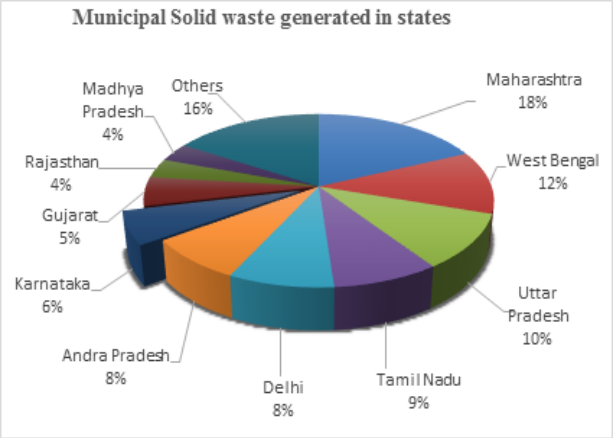

Figure 2: Municipal solid wastes generated in states.

Table 1: Municipal Solid Wastes generated cities in India

Major cities	Municipal Solid waste generated approximate in tons per day			
	Year 2000	Year 2005	Year 2010	Year 2015
Delhi	4000	5900	6800	7500
Mumbai	5400	5300	6500	7500
Chennai	3100	3000	4500	5500
Kolkata	3700	2600	3700	4600
Bengaluru	**2000**	**1700**	**2500**	**3500**
Hyderabad	1600	2100	4200	4500
Ahmedabad	1600	1300	2300	3000
Pune	700	1100	1300	2500
Lucknow	1000	500	1200	2300
Surat	900	1000	1200	2000
Kanpur	1200	1000	1600	2000

Table 2: Municipal Solid Wastes generated major Districts in Karnataka

District	Municipal Solid waste generated approximate in tons per day
Bengaluru	3500
Mangaluru	280
Dharwad	240
Mysore	220
Belgavi	130
Davanagere	**125**
Bijapur	100

In Karnataka state Davanagere district is 5th biggest city and is at the center of Karnataka, Coordinates $14^0$46' N latitude, $75^0$60' E longitude and 602 meters above sea level. According to survey conducted by 2011, Davanagere city had a population of 4, 35,140 and According to survey conducted by 17feb 2015 nearly six lakhs a population and Municipal Solid wastes generated approximately 125 tons per day, 0.18-0.5kg waste per person generated.

Figure 3: Market wastes Mandi pet Davanagere

Figure 4: Market wastes APMC Davanagere

Issues concerning to management of MSW in our country.

[1] Majority of the municipal authorities of cities does not have awareness to proven waste processing and disposal facilities.

[2] Cities and towns, in future, does not get wastelands for further dumping of wastes. Instead of there will be go for total recycling and re-use of waste and aim for Zero Waste for landfilling.

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[3] There is no filled short and long term plan with municipal authorities to handle MSW with the MSW Rules.

Economic and environmental concerns in a great amount of research another 50-60 years fossil fuels completely depleting, so we have to search alternative fuels for energy utilization purpose that is renewable sources of fuels to be replace fossil fuels. Burning fossil fuels such as coal and oil releases more CO2, which is a major problem to the global warming and with only nearly 5% of the world's population consider, to be the United States is responsible for about nearly 25% of global energy consumption and nearly 20% CO^2 emissions.

III. METHOD AND METHODOLOGY

Fallowing three major methods to converting municipal solid wastes into useful products such as a fuels

A. Biogas production from municipal solid organic waste
B. Bioethanol production from vegetables and fruit waste
C. Biodiesel production from inorganic waste

A. Biogas production

[1] Waste collected

Collected market wastes from various sources are segregated into organic and inorganic wastes, because plastic like materials will not be digested.

[2] Pretreatment process (Mechanical, Thermal, Chemical (Acid & Alkaline), Biological pretreatments)

The organic materials are sent to Homogenization process. In this stage the larger particle wastes are mixed and crushed into smaller particles (cellulose and hemicellulose) that can be easily digested by the microbes. Crushed waste materials are treated by water and other chemicals which aid in the digestion

[3] Feeding

The pretreated organic wastes are fed to the digester tanks along with the organic wastes water and inoculums are added to the digester

[4] Anaerobic digestion

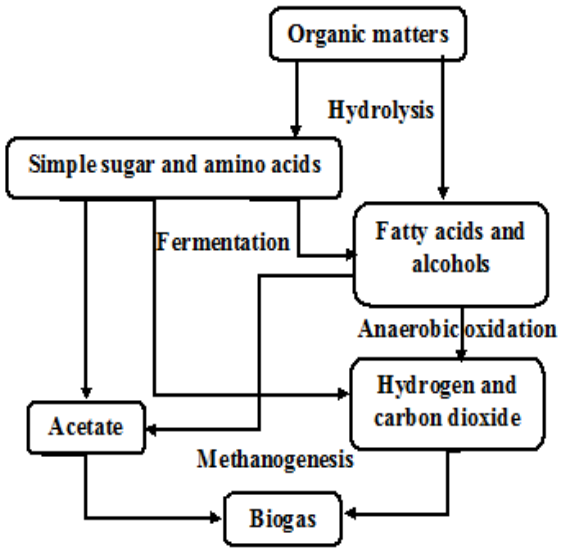

Figure 5: Process flow diagram for anaerobic digestion

Figure 6: Bapuji Institute of Engineering & Technology installing 6m^3 with 2 tones capacity biogas plant in progress

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B. *Bioethanol production*

The generation of bio-fuels from wastes forms an attractive solution towards both waste management and energy generation. The Bioethanol produced from different feed stocks such as corn, sugarcane, wheat, barley, etc. In this present study the feed stocks selected are fruits rind part, vegetable waste and *Samanea saman* (Rain tree) pods wastes as a possible resources by conversion of waste to fuel [2,9].

Sugar To Ethanol Process

The most straightforward approach to create ethanol is the sugar to ethanol generation. Consequently biomass is utilized that contains six-carbon sugars which can be matured straightforwardly to ethanol. Cases for run of the mill sugary feedstock sorts are sugar stick and sugar beets which contain considerable measures of sugars. Despite the fact that parasites microorganisms can be utilized for maturation, the particular yeast Saccharomyces cerevisiae (Baker's yeast) is as often as possible used to age glucose to ethanol. Conventional maturation procedures depend on yeasts that change over six-carbon sugars (primarily glucose) to ethanol.

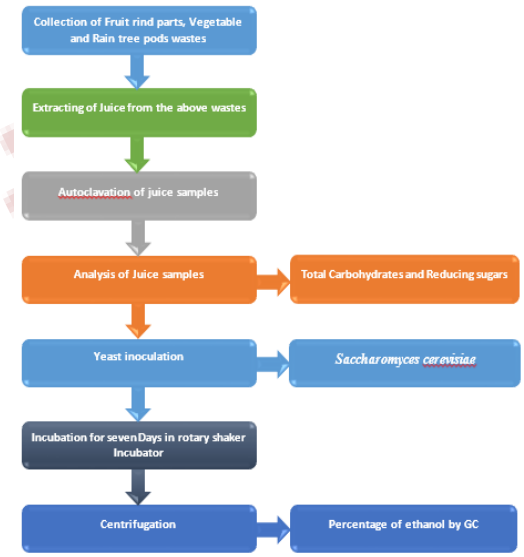

Figure 7: Process flow diagram for Bioethanol production

C. Biodiesel production

Thermolysis of waste plastics to liquid fuel a suitable method for plastic waste management and conversion of waste plastic into liquid hydrocarbon by using new technology we can convert all types of waste plastic into hydrocarbon fuel at the temperature profile 350ºc to 500ºc Low density polyethylene (LDPE). High density polyethylene (HDPE), polypropylene and polystyrene pyrolysis inorganic wastes used for biodiesel production

Figure 8: Pyrolysis unit

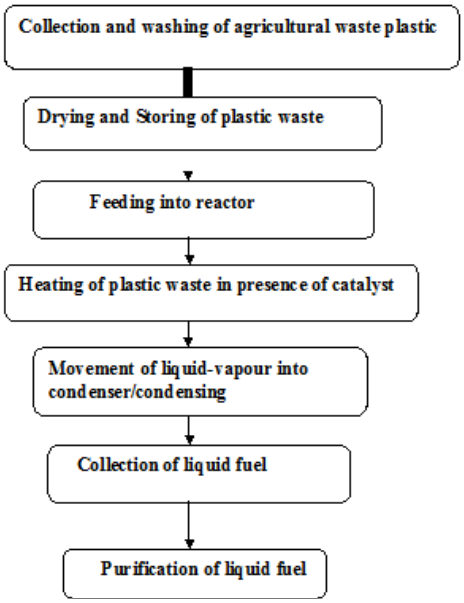

Figure 9: Process flow diagram for Biodiesel production

IV. CONCLUSION

Complete utilization of municipal organic solid wastes in to use fuel such as biogas and bioethanol. The pyrolysis process is use to convert plastics into useful liquid fuel compounds such as biodiesel. Municipal solid wastes completely utilized to produce biofuels. Produced biofuel compounds can use for use various application.

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