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Biomass Energy: An Alternate Source of Energy

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Abstract: Biomass energy is energy generated or produced by living organisms. the most common biomass materials used for energy are plants, crop residues, cattle dung,organic wastes etc. the energy from organisms or materials can be burned or decompose to create heat or converted into electricity. it can abundantly produced in rural areas.so it can be a source of alternate energy.

Biomass energy can extract by various method like thermo chemical, biochemical and agrochemical process. direct combustion, pyrolysis and gasification are the part of thermo chemical process. anaerobic digestion and alcohol fermentation production are the part of biochemical process. in agrochemical process extraction of biofuel from some xerophytes plant.

Keywords: Biomass, biogas, energy, plants, methane.

I. INTRODUCTION

Biomass includes all plants, plant residues, waster, wood, marine and fresh water algae, herbaceous plants, agricultural and forest residues. It also includes biodegradable organic materials from various industries. Biomass can also be produced from petro plants. Seeds of petro plants contain oil, with can be used as a substitute of diesel in vehicles and industries.(Bhattacharyaa,Chinmoy,2009)

The total biomass potential in India is 21000 mw. At present we are generating 1195.83 mw.

Pyrolysis process produces gas and liquid products and leaves a solid residue richer in content. This process occurs in the absence of O2 at under high pressure and temperature. Biomass energy extraction given in fig.1.1 (Soni Ranjeeta, 2019)

II. BIOGAS

Biochemical conversion of biomass generates.

Biogas is a mixture of CH4, CO2, H2, H2S etc. Biogas is produces when anaerobic bacteria digest arg. Matter in the absence of oxygen. This process occurs naturally into decomposition of solid waste into landfills where CH4 is collected through pipelines. All process competed in biogas plant (fig2.2). (Rubab and Kandpal, 1996)

CH4	68%	50 – 60% ⟶ CH4
CO2	26%	30 – 40% ⟶ CO2
H2	1%	5 – 10% ⟶ H2
H2O	5%	2 – 6% ⟶ N2

Traces of H2S traces of H2S

Calorific value ⟶ 5871 Kcal/m3

Heat value of biogas can be improved up to 30% by reducing its CO2 content.

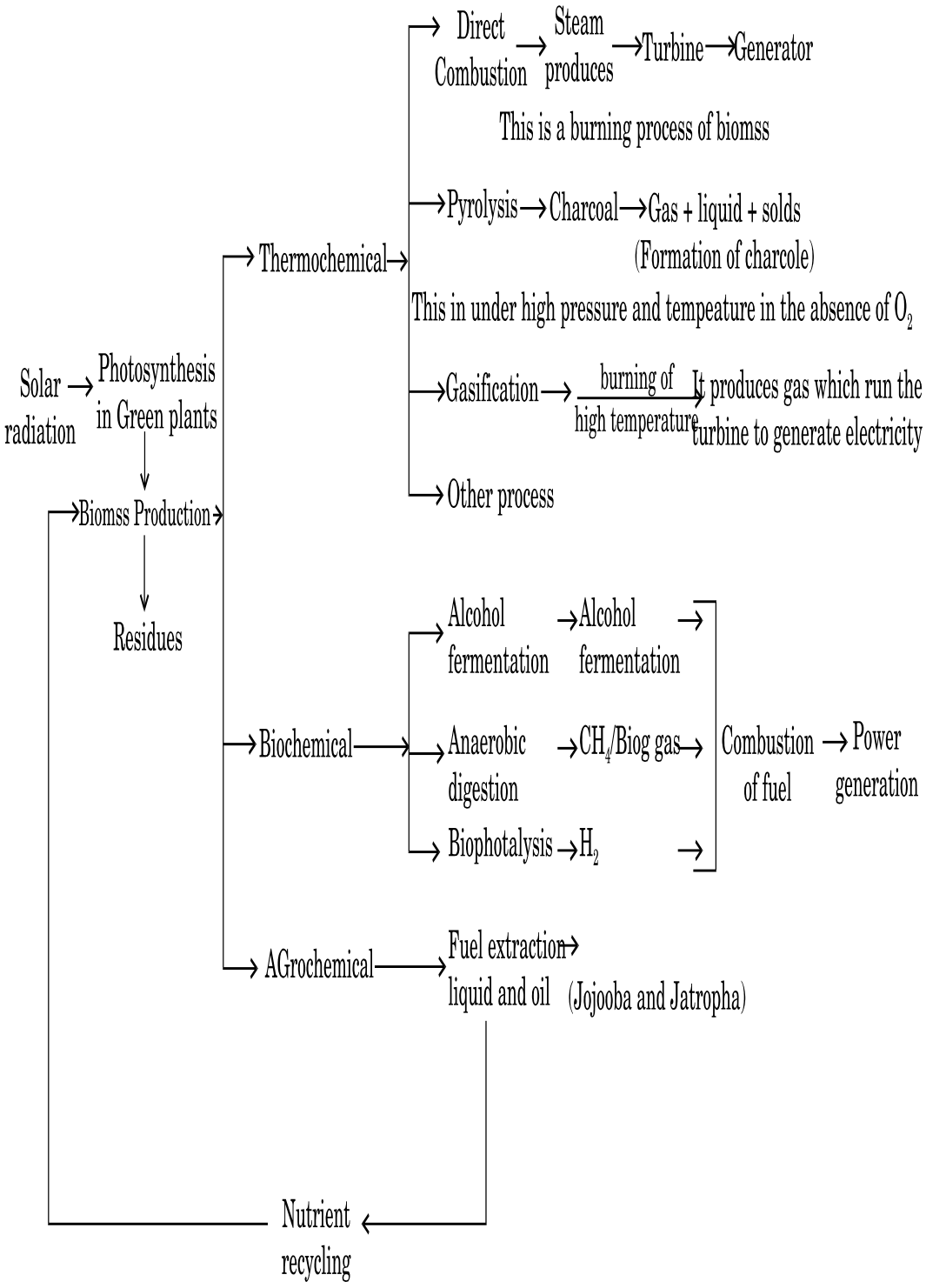

Fig.1.1: Biomass Energy

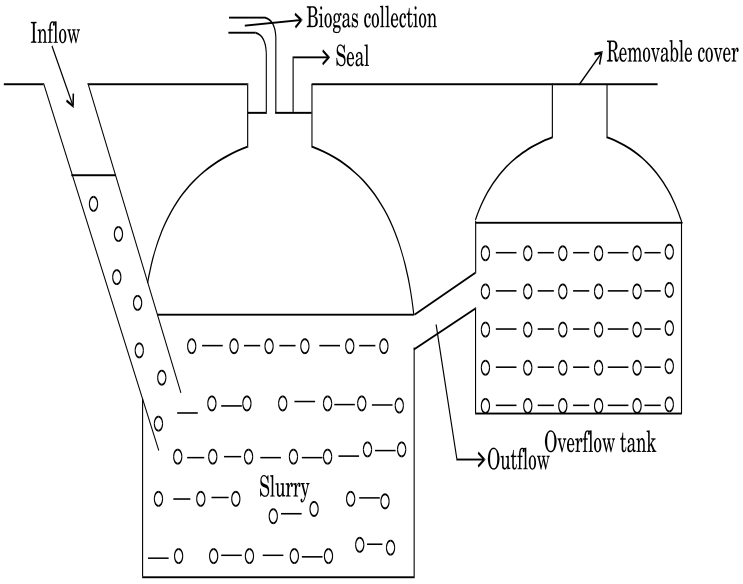

Fig. 2.2: Biogas Plant

2.1 Process of biogas production

There are some stages for production of biogas (Singh and Gua, 2010):

Solid organic matter

↓ 1. Solublization/Hydrolysis

Soluble organic matter

↓ 2. Fermentation

Transitionary end product

↓ 3. Link process

Methane precursor

↓ 4. Methanogenic

Methane + Other constituent

2.2 Advantages of Biomass Energy

1. Source of biomass available abundantly in rural areas.
2. It is a cheap energy source.
3. Easy to convert biomass into a high energy fuel such as alcohol or biogas.
4. It may also use areas of unused agricultural land.
5. It saves space in landfills by reusing waste products.
6. Along with this, growing agricultural crop for energy production help in stabilizing the soil, reduce soil erosion caused by air and water, controls flooding and enhances wildlife habitat. (Ravindranath, Rao, Natarajan andMonga, 2000)

2.3. Disadvantages of Biomass Energy

1. Burning of biomass produces greenhouse gases which cause air pollution.
2. Production of biomass energy generated Solid wastes.
3. Foul smell is present in production of biogas.
4. Methane may cause health hazards.

III. CONCLUSION

Biomass is a more sustainable power source and potential alternative to fossil fuel but it is not very vible. There are so many problems in the development and processing of biomass in form of bio fuel as discussed in disadvantages .But due to availability of agricultural waste and cattle dung in rural areas biogas production is a good practices and it is also a good method for waste minimization.

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Ranjeeta Soni has completed her Ph.D at the age of 34 from Jagannath University, Jaipur. She has more than 16 years teaching experiences. Presently she is working as a professor of Environment Science in Jagannath University in Physical Science Department. She has published more than 8 papers in International and National Journals. She published one book on Environment for UG Students and three book chapters and attended more than 17 conferences and seminars. She engaged in various academic and cultural activities of university. She is actively engaged in various environmental subject discussion of interacting radio councelling from IGNOU at AIR.