ASSESMENT OF NON-PLANTATION BIOMASS RESOURCES

Dr. Lata Sharma, Dept. of Botany

Dr. C.V. Raman University, Bilaspur

Abstract

In India, the dominant biomass fuels, mostly used in rural regions, are fuelwood, crop residues and animal manure at very low efficiencies. It is also possible to use industrial and municipal (urban) materials such as wastewater, municipal solid waste (MSW) and crop residues such as rice husk and bagasse for the generation of energy. This paper discusses the energy potential of crop residues, MSW, biomass fuels, animal manure and industrial waste.

Key words: biomass, MSW, generation, energy potential.

Introduction

Scarcity and rising fuelwood prices have changed the pattern of consumption of biofuel[1]. People are moving to dung and multiple crop residues because of the scarcity of fuelwood. The fuel effectiveness in national appliances, especially cook stoves, is small in most rural buildings, in the range of 10–14 percent. Improving the conversion efficiency[2] would therefore be an important step in enhancing the quality of life and environment. Efforts are already underway to support effective equipment and alternative sources of energy to improve quality of life and to conserve the resources of biomass.

Sustainable national biomass resource potential

It is essential to assess annually produced complete crop residue, livestock dung, MSW[3] and industrial wastewater, present concentrations of use and potential surplus available for energy use.

1. Agricultural crop residues
   It is essential to know the region under agricultural crops, crop patterns and crop residue[4] usage to evaluate crop residues for energy potential.
2. Municipal solid waste

In the periphery of towns and cities, municipal solid waste is usually gathered, transferred and dumped. The MSW is made of glass, metal, paper, rubber and other organic fuel. Although it is normal for rag pickers to sort out recyclable materials, other methods of handling, such as composting, incineration, etc., also occur to some extent. The complete amount of solid waste produced in bigger cities and towns was estimated at 20.7 Mt per year.

3. Fuelwood saving through efficiency improvement and fuel switching

   Fuelwood[5] in rural India is the dominant fuel consumed. Dependence on fuelwood has consequences, firstly on the environment as a result of unsustainable forest, village commons and farms extraction, and secondly on women's health and quality of life.

4. Animal manure

   The production of dung[6] relies on the population of livestock and the amount of dung per animal. It's hard to collect and use all the dung generated by cattle. The cattle are permitted to graze in open fields in India and therefore dung produced during grazing periods cannot be gathered.

5. Industrial wastewater

   In some industrial crops, such as breweries, sugar mills, distilleries, food processing sectors, tanneries and paper and pulp sectors, big quantities of wastewater are produced. In terms of organic load, food goods and agro-industries together account for 65–70% of the total industrial sewage[7].

Energy potential of agri-residues and other wastes in India

Source	PJ	
	1997	2010
Crop residue	4715	6565
Dung	336	374
Landfill gas	86	219
Industrial wastewater	4	200
Biomass conservation	—	506
Biomass substitution	—	900
Total	5141	8764

Conclusion

The above table describes the energy value of agri-residues and other wastes. Biofuels can be burned as a source of heat energy, transferred to heating or cooking gaseous fuels and eventually transformed into electricity. For instance, cattle dung can be dried and burned directly as strong biofuel in a heating or cooking cooker or transformed into biogas through anaerobic digestion and used as a heat source for cooking. The potential for fossil fuel replacement is probable to be distinct for distinct processes of conversion or end uses. Furthermore, some of the crop residues as well as other non-plant biomass may not be accessible for contemporary bioenergy or it is not known how much non-plant biomass can be obtained or commercially used.

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