

Framework to Shortlist Potential District for Setting Up Decentralized Biomass Pellet Plants

Introduction

Background

Biomass is renewable organic matter derived from trees, plants, crops or agro-industrial wastes. India annually produces about 870 million tonnes of a variety of biomass resources, which is comparable with coal production in the country. Availability of biomass is critical for further development and growth of biomass based energy systems. One of the major limitations of biomass for energy is its low density, typically ranging from 60– 100 kg/m³ for agricultural residues these low densities often make biomass material difficult to store, transport, and utilize. To overcome this limitation, the density of biomass needs to be increased. Commercially, densifications of biomass is performed using pellet mills and other extrusion processes, or briquetting presses, to increasing the density and help overcome feeding, storing, handling, and transporting problems. For pelletizing industries to come, the constraint is continuous availability of biomass at reasonable price. Though in principle a variety of biomass residues such as bagasse, rice straw, cotton stalk, groundnut shells etc. are available for pelletizing, the economics and logistics of collection, transport and storage of these residues can be tricky affair. Therefore, it is utmost important to select an appropriate site from the point of resource availability, its existing and alternate usage, market demand

of densified fuels in HHs, institutions and Industrial use. As the pelletizing industry in India is still nascent stage, the contribution of biomass pellets fuel to the total fuel mix is insignificant at present.

The aim of this research is to develop a comprehensive framework based on secondary data and to undertake a comparative analysis for various districts in Uttar Pradesh for setting up decentralized pellet production plants and to recommend two districts, where this can be piloted.





An attempt has been made to develop a robust framework based on secondary research to identify potential districts from the point of availability of existing biomass, its current and future demands in HHs, institutions and in industrial applications. A case study based on this framework is underway in the State of Uttar Pradesh with aim to set up biomass pelletizing plants in the potential districts.

Objective

The objective for developing this framework is to assist the pellet manufacturers in India in identifying potential districts for setting up decentralised pellet production plants.

Possible users/beneficiary of this framework are:

1. Prospective biomass developers and investors in the sector
2. Energy entrepreneurs
3. Equipment manufacturers and distributors (cook stoves and pellet machine)
4. Development of reliable and accessible database system for biomass resources at cluster/industrial zone level
5. Academic and research community

About the Framework

The key factors which play an important role in supply and demand side are considered in formulation of this framework.

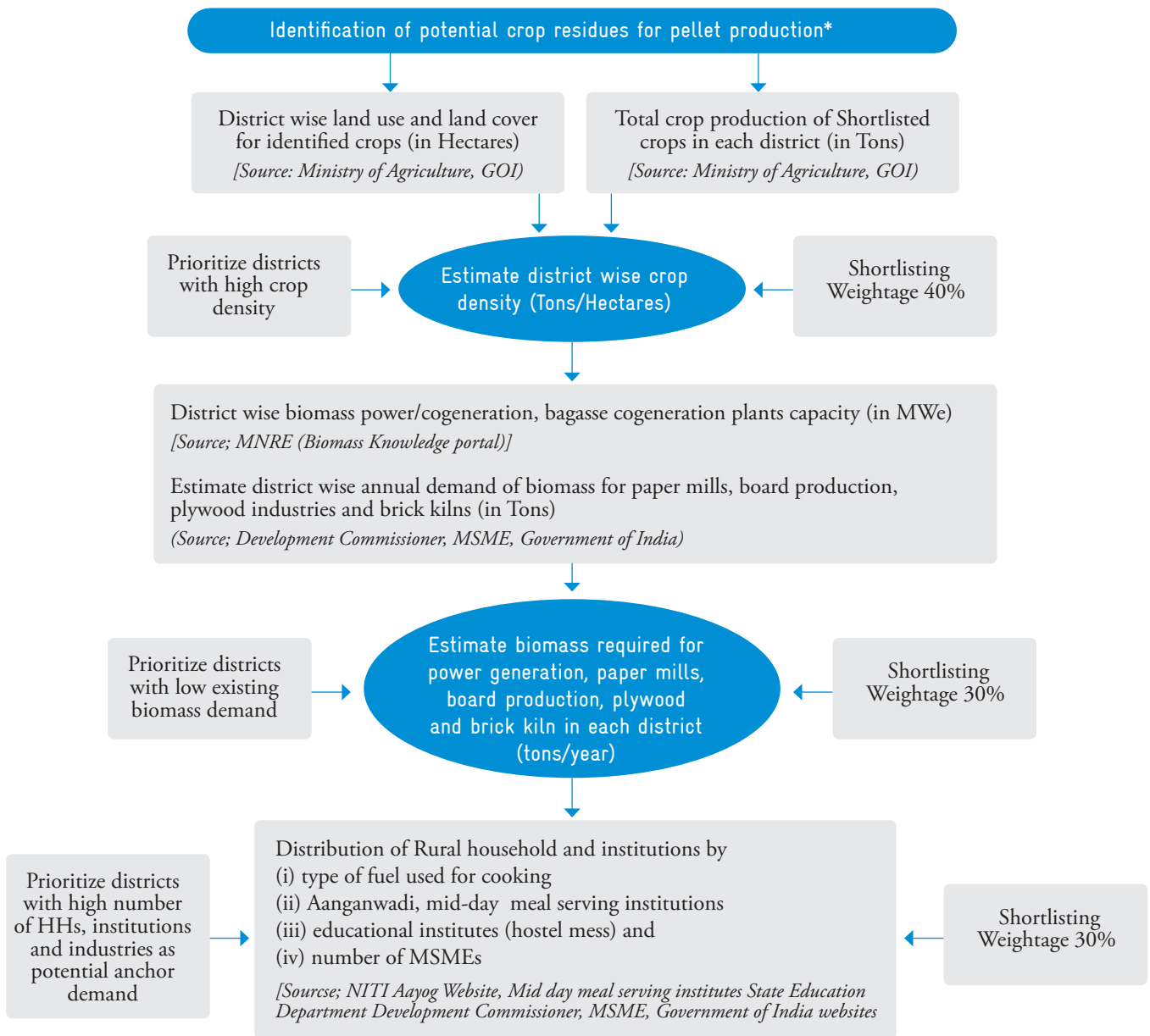
Supply side

The supply side measures primarily include availability of suitable biomass for pellet production. The choice of pellet manufacturing machine will depend on the type of available surplus biomass. Land use and land cover under crop cycles along with the crop density for each district is a preliminary factor for shortlisting of districts.

Biomass is utilised for power generation in large quantities for biomass power plants and sugar mills for cogeneration application. In addition to this, biomass is also used as animal fodder, fertilizers and other small enterprise like local paper mills, board manufacturing units etc. as inputs. These data will be important to determine availability of surplus biomass.

Demand side

The demand side measures are important for the financial viability of a pellet production plant by establishing market. The entrepreneur needs to focus on demand of pellets in a particular area. Presence of institutions (mid-day serving institutions and aanganbadis etc.), commercial/institutional users (MSMEs etc.), and distribution of households by fuel type will determine demand and paying capacity of a particular area.



* Exclude crop residues which are generally used as fodder

* Pre-processing of biomass and storage of pellets are important steps in pellet production, which are sensitive to climate conditions like humidity at particular district. Climate zone of the district is also to be considered to decide the particular district.

* Paying capacity of the potential users and willingness to pay for pellet fuel need to be assessed

* Operational factors need to be assessed after the initial sifting



Dr. rer. nat. Harald Richter
Programme Head

Indo-German Energy Programme – Access to
Energy in Rural Areas (IGEN-Access)

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
B5/2, 2nd floor, New Delhi 110029, INDIA

E: harald.richter@giz.de

T: +91 11 4949 5353

F: +91 11 2460 3831

W: www.giz.de/india

Registered offices Bonn and Eschborn:

Friedrich-Ebert-Allee 40
53113 Bonn, Germany

Phone: +49 228 44 60-0

Fax: +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1-5

65760 Eschborn, Germany

Phone: +49 61 96 79-0

Fax: +49 61 96 79-11 15

Email: info@giz.de

Internet: www.giz.de

Project name	Indo-German Energy Programme – Access to Energy in Rural Areas (IGEN-Access)
Commissioned by	German Federal Ministry for Economic Cooperation and Development (BMZ)
Lead executing agency	GIZ
Partner organisation	Ministry of New and Renewable Energy (MNRE)
Duration	03/2015 – 03/2018