Biomass agro-residue resource availability in Tamil Nadu

This state wide biomass resource assessment updation was undertaken by Deloitte in the year 2009 as part of "Review of Performance of the Grid Connected Biomass Based Power Plants Installed in South India" study under the MNRE-UNDP/GEF project on "Removal of barriers to biomass power generation in India". Biomass power potential in Tamil Nadu was re-assessed by updating the agro-residue production in the state using the most recent agriculture crop production data, taken from Directorate of Agriculture, Tamil Nadu for the year 2007-08 available at the time of study. Crop to agriculture residue production ratios used in the study were taken from Biomass Resource Atlas prepared by IISc, Bangalore.

Agriculture production in Tamil Nadu

In Tamil Nadu, about 60 percent of the biomass resource potential is provided by woody biomass such as Prosopis Juliflora and Tapioca. The other biomass resource include coconut frond residue and rice husk which contributes 30% and balance comes from agro-residues such as stalks, cobs, shells, etc. Table 1 presents the type of agro residues, surplus biomass available and power potential in Tamil Nadu. With geographical area of around 15.1 million hectares, the average agro residue density and biomass power density of the state works out to about 0.45 ton/ha and 0.53 MW/sq.km. District wise agro-residue resource and corresponding power generation potential are presented in Table 2.

Table 1: Agro-residue availability and power potential in Tamil Nadu

Agro-residue type	Surplus biomass ('000 tonnes)	Power Potential (MW)
Prosopis Juliflora	2,208.4	239.3
Tapioca stalks	1993.9	220.8
Frond residue	741.0	96.3
Paddy straw	714.2	85.7
Paddy husk	666. 6	73.3
Cotton stalks	145.9	19.0
Ragi Straw	117.6	14.1
Maize stalks	87.7	11.4
Groundnut shell	91.1	10.9
Jowar stalks	41.7	5.4
Maize cobs	39.5	5.1
Bajra cobs	20.9	2.7
BG stalks	19.8	2.6
Jowar cobs	12.2	1.7
Cotton ball shells/husk	10.4	1.4
RG stalks	7.6	1.0
Sunflower stalks	2.8	0.4
Bengal G stalks	0.9	0.1
Total	**6,922.9**	**791.3**
Agro-residue density (ton/ha)		**0.45**
Power density (MW/sq.km)		**0.53**

Table 2: Surplus biomass and power potential in Tamil Nadu

	Surplus biomass ('000 tonnes)	Agro-residue density (ton/ha)	Power potential (MW)	Power density (MW/sq.Km)
Namakkal	479.8	1.43	57.7	1.72
Kanyakumari	220.2	1.31	26.1	1.55
Cuddalore	430.5	1.21	47.1	1.32
Madurai	407.8	1.09	42.8	1.14
Salem	735.7	0.85	84.3	0.97
Thiruvannamalai	491.4	0.79	51.6	0.83
Dharmapuri	690.9	0.72	78.0	0.81
Erode	535.8	0.66	58.1	0.71
Pudukottai	249.1	0.53	21.4	0.60
Thanjavur	178.9	0.50	39.6	0.57
Villupuram	333.1	0.48	26.3	0.56
Ramanathapuram	174.5	0.42	10.4	0.49
Thiruvarur	88.0	0.42	18.9	0.46
Tiruchirapalli	434.3	0.39	33.2	0.45
Coimbatore	257.0	0.35	47.9	0.43
Perambalur/Ariyalur	148.2	0.32	18.0	0.39
Vellore	122.1	0.28	15.1	0.35
Kancheepuram	113.7	0.26	13.3	0.30
Theni	66.4	0.23	8.4	0.29
Dindigul	123.7	0.21	15.8	0.26
Krishnagiri	106.4	0.21	13.0	0.25
Nagapattinam	81.9	0.20	9.6	0.23
Karur	52.6	0.18	6.4	0.22
Virudhunagar	74.7	0.18	9.3	0.22
Tirunelveli	131.8	0.17	15.9	0.20
Sivagangai	55.5	0.14	6.6	0.16
Thiruvallur	85.4	0.11	6.3	0.14
Thoothukudi	50.2	0.11	9.9	0.13
The Nilgiris	3.3	0.01	0.4	0.02
Chennai	0.0	0.00	0.0	0.00
Total Tamil Nadu	6,922.9	0.46	791.3	0.53

The surplus agro-residue availability for Tamil Nadu at the time of the study was about 6.92 million tonnes with power production potential of about 790 MW. The other important findings of the study were

- Most of the biomass plants in the state are using Prosopis as a fuel.
- The northern districts of the state have large number of small and micro enterprise in unorganized sector and consuming substantial quantities of biomass residue for replacing conventional fuels such as furnace oil and diesel.