

Impact of wood based energy on Forests in India

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Fuel wood has remained the principal component of rural domestic energy, and also the source of commercial energy such as brick kilns, hotels and restaurants in semi-urban areas. The percentage of population using fuel wood is higher in rural areas (67.3%) and 14% in urban and semi-urban areas (NSSO, 2012). Fuel wood is largely used by women for cooking purpose and approximately spends

more than 374 hours in a year for collecting fuel wood (clencookstove.org). The fuel wood has been collected from forests, trees grown on farm lands, homesteads and common land outside forest. The annual fuel wood consumption by 854 million people in India is 216.4 million tonnes per year (FSI, 2011). Around 27% of fuel wood has been collected from Government owned forests (Public Land)

The state wise details are given below:

Annual Fuel wood Consumption						
1	2	3	4	5	6	7
S. No	State/UT	No of persons using Fuel Wood (millions)	No of Persons using Fuel wood from Forests –Public land (Million)	Quantity of Fuel Wood used (million tonnes)	Quantity of fuel wood used from Forests-Public land (million tonnes)	Percentage of Column 6 w.r.t column 5)
1	Andhra Pradesh	64.992	7.573	24.293	2.966	12.21
2	Arunachal Pradesh	0.882	0.698	0.402	0.325	80.93
3	Assam	23.373	5.812	11.421	2.494	21.83
4	Bihar	65.816	3.115	11.475	0.465	4.05
5	Chhattisgarh	20.078	7.818	4.366	1.378	31.56
6	Gujarat	40.092	7.497	9.731	2.225	22.87
7	Haryana	8.092	0.012	1.494	0.003	0.17
8	Himachal Pradesh	5.912	5.646	1.214	1.163	95.8
9	J & K	8.375	4.54	1.394	1.015	72.8
10	Jharkhand	21.733	9.984	4.844	2.849	58.81
11	Karnataka	44.681	9.584	20.967	5.776	27.55

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12	Kerala	29.504	4.429	14.543	2.183	15.01
13	Madhya Pradesh	51.007	24.839	13.665	7.191	52.63
14	Maharashtra	68.904	31.845	9.508	4.527	47.61
15	Orissa	33.029	11.11	8.894	2.971	33.4
16	Punjab	13.628	0.136	3.348	0.029	0.87
17	Rajasthan	57.992	11.414	18.782	3.698	19.69
18	Tamil Nadu	42.405	7.429	12.387	2.601	21
19	Uttar Pradesh	175.096	10.495	19.063	1.294	6.79
20	Uttarakhand	7.289	6.06	2.566	2.139	83.38
21	West Bengal	51.202	18.574	14.158	6.361	44.92
22	North Eastern States	9.383	6.588	5.274	3.822	72.48
23	UTs	10.412	4.432	2.633	1.272	48.32
	Grand Total	853.877	199.63	216.422	58.747	27.14

Source ISFR, 2011

India is home to more than 240 million households out of which about 100 million households are still deprived of LPG as cooking fuel and have to rely on firewood, coal, dung – cakes etc., as primary source of cooking. The smoke from burning such fuels causes alarming household pollution and adversely affects the health of women & children causing several respiratory diseases/ disorders. More than 100000 people die prematurely in India from disease caused by inhaling smoke from fuel wood and other biomass used for cooking. Considering health of the people and environmental problems, more than 30 million families have been provided free cooking gas (LPG) connections by Government of India but this scheme was failed to achieve its objective due to withdrawal of subsidy on sale of LPG resulting into more use of fuel wood. The unsustainable harvest of fuel wood is major driver of forest degradation and impacting adversely more than 30 million hectares of forests.



The government of India has also cancelled the subsidy given on LPG which resulted in increased use of fuel wood for cooking and commercial purpose in rural and semi-urban areas. The source of energy for domestic and commercial use in rural and semi urban areas is largely fuel wood which contributes to more than 93% of GHG emissions from forestry sector in India (Sharma, 2017).

The estimated scenario of GHG emissions and removal of CO₂ is given below:

Table 2: Inventory of GHGs in Forestry Sector in India (BAU)

Estimated Emissions/Removals	2015	2020	2025	2030
Total emissions	482.84	539.16	587.71	626.95
Total removals	398.87	408.11	415.03	422.36
Net Emissions	83.97	131.05	172.68	204.59

Source: TERI Analysis

Indian forestry sector is net source of GHGs. The major reason is use of fuel wood in domestic and commercial energy particularly in rural and semi-urban areas which

is the major cause of forest degradation in India as shown in the following table:

Table 3: Trends of forest resources as reported in India's State of Forest Reports (ISFR)

Forest resource accounting variable	ISFR 2003	ISFR 2005	ISFR 2009	ISFR 2011	ISFR 2013	ISFR 2015	ISFR 2017	Net Change between 2003 to 2017	% change between 2003 to 2015
Forest Cover (in square kilometres)	686,767	692,027	6,90,899	6,92,027	6,97,898	7,01,673	7,08,273	20,506	3.13
Growing Stock in Forests (million cubic meters)	4781.414	4602.04	4498.7	4498.73	4173.36	4195.047	4218.38	-563.034	-11.78
Growing Stock in Forests and Tree outside forests (million cubic meters)	6413.752	6218.28	6098.2	6047.15	5658.05	5768.387	5822.377	-591.373	-9.22

Source: FSI 2003; FSI, 2005; FSI 2009; FSI 2011; FSI 2013; FSI 2015; FSI 2017

There is reduction in the growing stock from 2003-2017 and will be further reduced if policy and

programs implemented business as usual which indicate the forest degradation. The Forestry Sector

will be net source of GHG emissions in future due to unsustainable harvest of fuel wood and other MFPs, forest fire, overgrazing and poor regeneration. The overdependence on forests for livelihood and domestic consumption has to be substituted with natural resource based livelihood and irrigated agriculture and assisted natural regeneration which requires 6153 million US \$ per year along with other policy interventions such as community based forest governance, capacity building of frontline staff and

community, involvement of private sector. Government of India needs to revive subsidy on cooking gas (LPG) to reduce the unsustainable harvest and use of fuel wood. This will help India in achieving NDCs of forestry sector, mitigating climate change, poverty alleviation, biodiversity conservation and improvement in the quality of forests , and also contributing towards SDG 13,14,15, national biodiversity targets and Aichi Targets.

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