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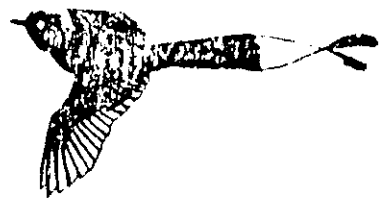

PROPOSED BIOMASS BUDGET ESTIMATIONS FOR INDIA

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January 1987

Technical Report No. 21

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A comprehensive, reliable knowledge of existing potential resources s availability and the requirements is very much essential for any planned development, based on which effective management strategies for sustained utilisation can be formulated.

India, as a whole is heterogeneous in terms of land use, cropping pattern, soil type, rainfall, human and livestock population, climate and topography. Hence the demand and availability of biomass would vary widely in different parts of the states. Thus for resource management it is worthwhile to delineate different regimes which are homogeneous in respect to the above mentioned ecological factors. So, our main objective would be

a) to delineate ecologically homogeneous regions

b) to prepare balances of production and demand of biomass with respect to food, fuel, fodder, manure and shelter.

Data Base

The data has been acquired from several organisations for 357 district for 22 states and 8 union territories for India which would constitute the data base.

I Central and State Directorates of Economics and Statistics have supplied the following land use & cropping patterns.

A. Land use

1. Geographical area, and irrigated areas
2. Forests
3. Not availablefor cultivation
4. Other uncultivated land (Permanent pastures and other grazing lands, land under misc tree crops and sacred groves) culturable wasteland.
5. Fallow (Fallow lands other than current fallows, current fallows)
6. Net sown area
7. Total cropped area
8. Area sown more than once

B. Irrigated land

1. Net area irrigated from canals, tanks, wells and other sources by Government and private agencies
2. Food crops and non food crops irrigated in Kharif, Rabi and summer seasons through different sources.

C. Cropping Pattern

1. Area grown under cereal and millet crops in autumn winter, and summer seasons: rice, jowar, bajra, maize, ragi, wheat, barley.
2. Area under pulses during the different seasons: gram, tur and other pulses.
3. Sugar producing crops: Sugarcane, other varieties
4. Area under condiments and spices: pepper, chillies, ginger, turmeric, cardamom, arecanut, garlic, coriander, etc.
5. Area under fresh fruits and vegetaable: mango, citrus fruits, banana, grapes, pome fruits, papaya and other varieties.
6. Area under dry fruits: Cashewnut, and other varieties.

7. Area under fruits and vegetables including root crops: Potatoes, tapioca, sweet potatoes & onion.

8. Area under oilseeds: groundnuts castor, rapeseed linseed, coconut, nigerseed, sunflower seed and others.

9. Area under fibrous crops: Cotton, jute mesta, sunhemp and other varieties

10. Area under dyes and tanning materials.

11. Area under narcotics and plantation crops: Opium, tobacco, cinchona, Indian hemp, tea, coffee, rubber.

12. Area under non food crops, guar, oats, fodder crops green manure crops.

b. The average yield and production of the principal crops could be acquired state-wise only (84-85)

II Human population based on census of India-1981 for all the districts All India.

III Fertiliser association of India, New Delhi - has supplied the seasonwise production and consumption of N,P,K fertilizers(1984-85).

IV Based ono thirteenth Quinquennial Livestock Census 1983 data has been collected from all the Animal Husbandry departments of States district wise, for some states-talukwise data also is available).

- Number of Indigineous/cross breed/cattle/buffalossheep/goats
- Number of local and cross breed

Cattle male	below 3 years young above 3 years Adult
Cattle female	Young Adults/Dry/Milching

- Number of Local and cross breed

Buffaloes male	Young

Adult

Buffaloes female — Young
Adult
Milching

C. Number of sheep, goats, pigs, horses, poultry, mules, donkeys, camel

Districtwise data to be used in delineation of zones are proposed:

a) Area under major cereal crops

b) Districtwise area under forests with two productive levels closed and open forest would be estimated from forest maps prepared by National Remote Sensing Agency from satellite imageries.

c) District wise area under wastelands under categories of 2-3 productive levels would be estimated fromo NRSA wasteland maps.

d) Area under settlements, would be taken from Directorate of Economics & Statistics, New Delhi.

e) Mean monthly rainfall.

f) Human population.

g) Soil map

A total of 365 districts including 6 union territories would be sorted out into different homogenous classes or regions. Principal component analysis would be used to reduce the dimensionality to two dimensions. Finally on basis of clustering (to bring together the closely related data points together in clusters), ecologically homogenous regimes will be defined.

Having identified the regimes, the balances of production and demand of biomass with respect to food(calories, proteins) fuel, fodder, manure, thatch and timber would be worked out on basis of (Gadgil and Sinha 84-85) published in State of Environment Report, with suitable modifications.