

# ECOFRIENDLY AND SUSTAINABLE POWER GENERATION FROM NON-EDIBLE PLANTS WITH THEIR LUXURIOUS GROWTH- A PROSPECT IN RURAL INDIA

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## Abstract

A vast rural wasteland and low laying areas in rural India can be rendered productive through green route for harnessing energy using wild plant with luxurious growth called dendro plants which are not used for fodder and other purposes till now. The residue can be used for making bio-fertilizers and other commodities of commerce of very high quality. This can reduce rural unemployment, checking if not preventing rural urban migrations improving their economy, reducing population density of cities and maintaining delicate ecological balance.

## Introduction

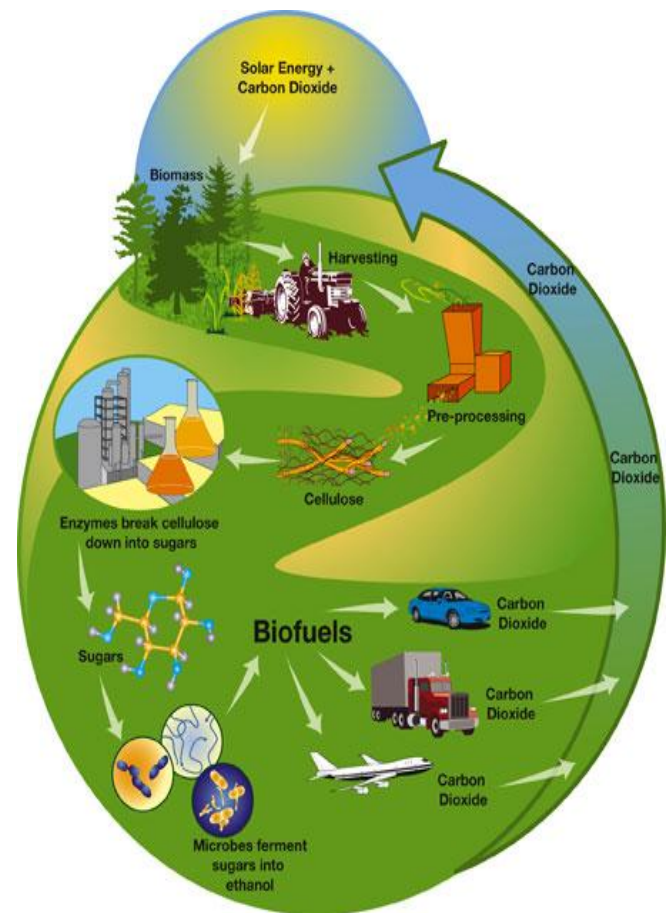
Development depends on energy, leading to the energy crisis. With a targeted GDP growth rate of 7 to 8 percent, and an estimated energy elasticity of 0.80, the energy requirements of India are expected to grow at 5.6- 6.4 percent per annum over the next few years. This implies a four-fold increase in India's energy requirement over the next 25 years and India faces significant challenges to meet this. To a great extent we are dependent on fossil fuels like petroleum. India is, however, poorly endowed with oil assets and has to depend on crude imports to meet a major share of its needs (around 70 percent). With the burgeoning human population this problem has further aggravated and conventional sources of energy are inadequate to meet the growing demands of power for two reasons-

1. Its limited stock
2. Pollution factors

Therefore, renewable or inexhaustible energy resources for power production are a must.

Dendrothermal energy if harnessed and managed scientifically can solve the power crisis to a large extent. Wastelands and low laying water bodies can be used for plantation of woody plants having high calorific value which can meet the demand of fuel wood, charcoal, fodder, power and can also provide rural employment. Through gasification system these can generate enough energy to cater the needs of rural India. In India we have tremendous potential for this technique due to availability of such waste land and such water

bodies which has been unproductive so far. This can be a major project particularly for states like Bihar, Orissa, M.P, Rajasthan and many other states having similar low lying areas.



## Problems and Solution

A renewable resource are regenerated by natural process so that they can be used indefinitely and causes much less negative environmental impact than fossil fuel or nuclear energy but with the current state of technological know;

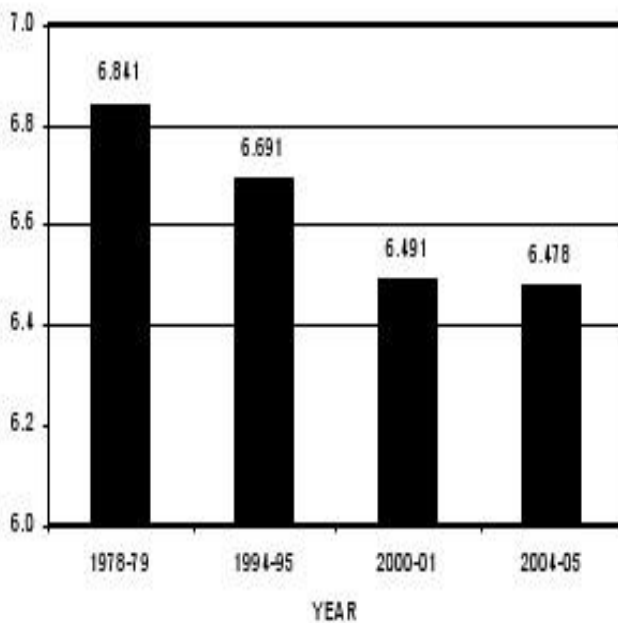
power generation from such sources is far more costly than energy produced by fossil fuel. With the advanced technologies we can generate power through these sources at low costs.

Also due to social unacceptability factors, it is difficult to generate power from biogas but with the technological advances and education we have a ray of hope to generate power through these sources at very low cost.

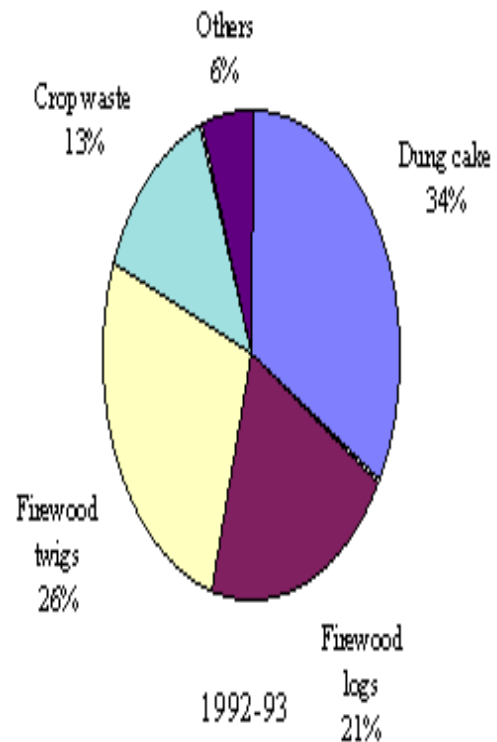
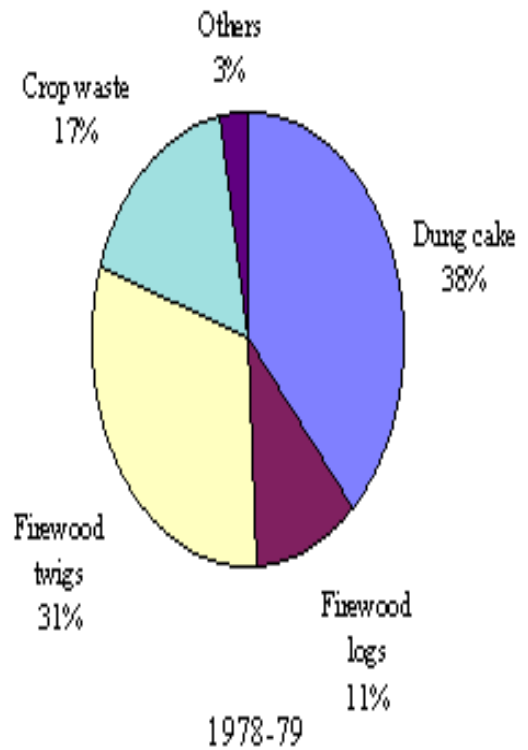
With modern agro forestry system coupled with high advances in technology of energy conversion we can go a long way. Through commercial forestry we can aim to fulfill the commercial demand to a large extent.

### Some Statistics

The data below give an average idea and of Estimated fuel wood consumption and Gradual decrease in fuel wood availability in India.



*Figure 3.2 Estimation of sustainable fuel wood supply in Nepal*

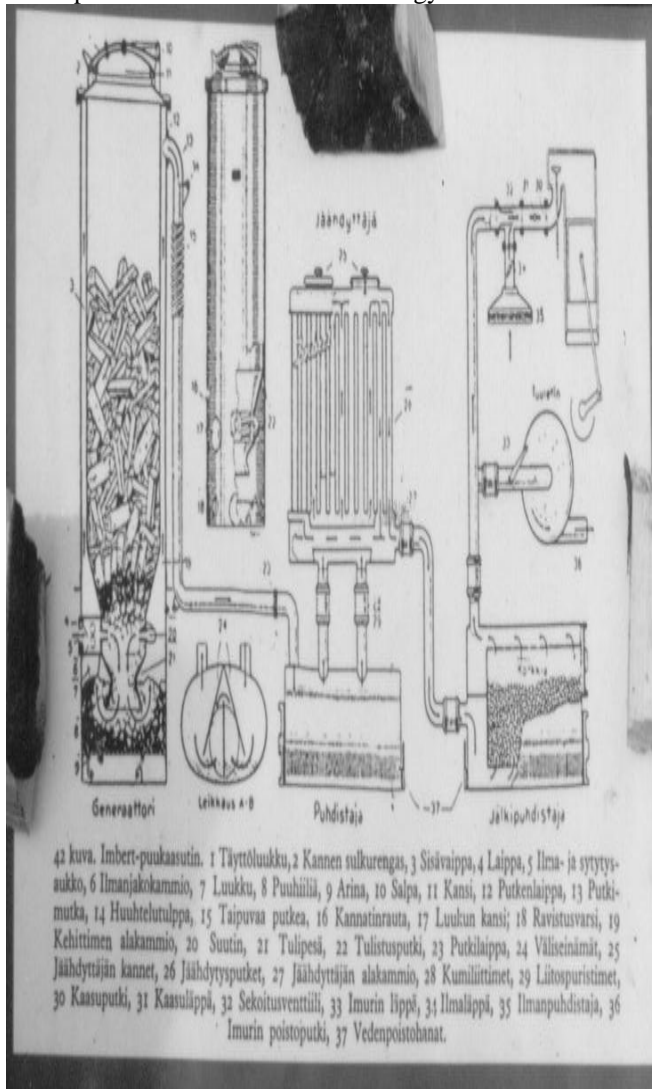


The share of fuelwood in household energy consumption was higher in rural areas (82%) which accounted for 72% of total household energy consumption.

## Methodology

### A. Gasification of biomass.

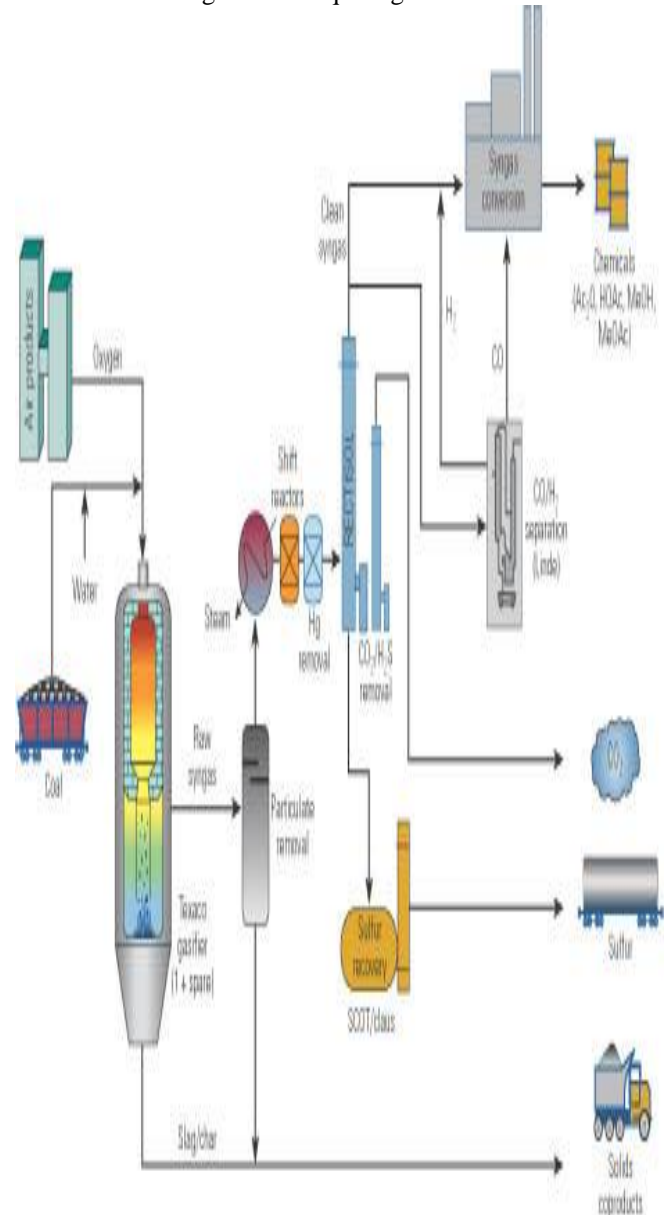
It can be done through thermo-chemical conversion. It yields biogas, producer gas and pyrogas. Biogas is an important solution to the present energy crisis especially for rural masses of India. Besides gas slurry can be used to produce organic mass surge containing phosphate ( $po_4^{--}$ ),  $k_2O$  (pot-ash). With the improvement in biogas plant technology we can trap maximum amount of bio-energy.



BIOGASS PLANT AN OVERVIEW

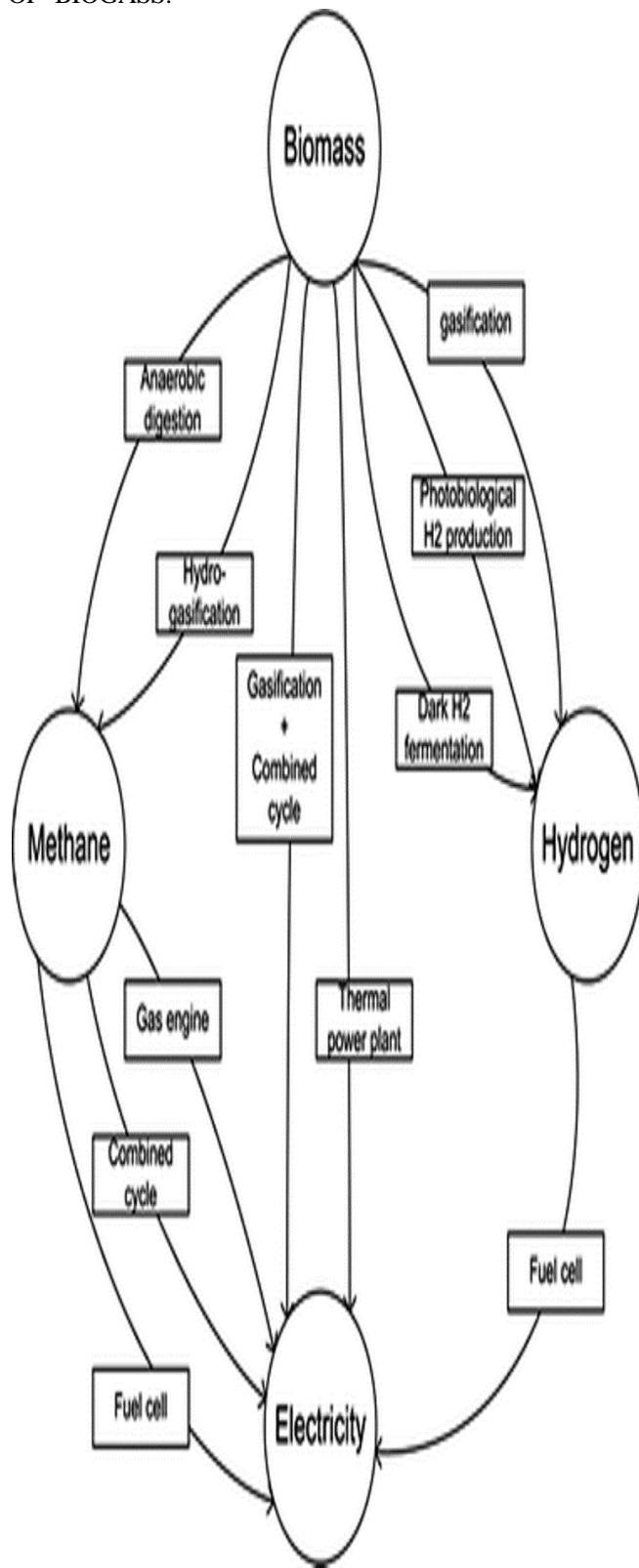
### B. By fermentation technology

We can produce biogas and bio-fertilizers. Restricted use of water and better strains of methane generating bacteria are required for this technology. Genetically modified bacteria (GMB) can be used for better and quick fermentation. Such bacteria might operate at lower temperature than 293k even, making it favorable for any condition Heated in a closed container and the gases and liquids given off are collected.



The distillation of wood Charcoal is a useful by-product of wood obtained by the process of carbonization. Other valuable products can be obtained by treating wood in different ways. Some of the gases can then be condensed to provide a range of useful chemicals; those that do not condense can be used as a gaseous fuel for the distillation process itself, or for some other use.

Except these technologies there are various other methods also like clean gasification, using modern gasifiers etc



## Objectives

This project is based on empirical observation and if funded by government and non-governmental organizations properly and managed scientifically can solve to the large extent the energy demand of rural masses. Besides energy demand it can generate employment in rural areas. Following are some important reasons for rural- urban migration:-

- A. In search of better livelihood.
- B. Attraction for the cities or town life.
- C. To exhibit talent
- D. To uplift the standard of life
- E. To contribute to the mankind
- F. To get rid of frustrated life.
- G. To see real life comfort.
- H. To get social asylum
- I. To have a life in night.
- J. For better future of coming generation.

But one purpose which is convincingly and undisputedly common is economic pursuit. So, improving rural economy is a very effective way of checking if not preventing completely rural-urban migration in India. With the production of bio-fertilizers, the production of food grains, vegetables and fruits can be increased without damaging environment and health.

## Conclusion

Project aims to utilize vast wastelands and low lying water bodies which have been unproductive so far in India for getting Dendrothermal energy and valuable by products for producing charcoal, pyroligneous acid, bio-fertilizer, etc. it is a new route to produce energy and valuable by-products without damaging the environment. Petro plants using new generation catalysts in future might meet the petroleum need



of our country. So this project basically will make such lands productive. This project is especially useful for rural masses whose economy will improve & their standard of life will prevent rural urban migration which has created a big problem in recent years for urban life. An increase in population density of cities, towns have damaged delicate ecological balance and have

given rise to many social and health problems, unnecessary traffic jams have hampered the life. So my dream project will attract scientists of all disciplines to work together with synergic concept in the field of research.

## ACKNOWLEDGEMENT:-

The author wishes to express his deep sense of gratitude to Prof. Dr. Ashok Kumar Mishra, lecturer L M V hafizpur, J.P University, chapra, for guidance and constant encouragement.

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