



Experimental Investigation on Smokeless Cooking Stove with Blower Attachment Using Small Wooden Pieces as its Fuel

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ABSTRACT

The present day cooking is a challenging process using the conventional gas stove due to the increasing gas cylinder cost thereby focusing on other options for cooking which will save cost. This project utilizes a stove having conical cup shape vessel and uses small wooden pieces as its fuel. The inner shell of the stove is made up of cast iron and the outer shell is made up of mild steel with proper vent holes at the bottom through which air is blown using a blower operating on D.C power supply and producing an output of 4.5 Amps with a maximum power consumption of 1.5 units/month leading to very minimum operating costs. Waste wooden pieces are used as source of fuel for burning which also are obtained as waste materials in carpentry workshops, thereby eliminating the need of costly fuel like gas. The cooking time is very fast and efficient. The process does not produce smoke and is environment friendly ensuring complete retention of good taste for the cooked food. The wood charcoal obtained during the process can also be utilized as filter element in water filters hence the byproducts of the burnt wood is also effectively used. This stove is portable and can be carried anywhere easily. We can get power even from car adapter or 12V battery and food can be cooked on the spot easily. This project is useful while traveling remote areas such as hill stations and tourist places etc. This project attempts to develop a low cost cooking stove with a cost effective method of operation and thus having enormous scope for the benefit of our society.

Keywords: Key Words: smokeless cooking, low cost cooking, wooden fuel, environment friendly cooking.

1. Main text

In contrast to LPG, this portable wood stove offers a cost-effective cooking solution while providing no health risks. It's a powerful wood burner that may be used for cooking while camping, hiking, hunting, emergency preparedness, or any other outdoor recreational activity. It's also extensively utilized in areas with no or limited electricity (tribal and deep rural areas), where it's an environmentally friendly and cost-effective cooking option.

Table 1 Comparing the woodstove with normal and rocket stove

S.NO.	PARAMETER	NORMAL STOVE	ROCKET STOVE	WOOD STOVE
1	Fuel Type	LPG or Wood	Wood Logs	Wood Logs
2	Operation	Gas Fired or Natural Draft air	Natural Draft Air	Turbocharged Air
3	Feeding System	Manual	Manual	Manual
4	Weight	< 10 kg	< 10 kg	< 10 kg
5	Accessibility	Not Portable	Portable	Portable
6	Smoke Treatment	Heavy smoke	No smoke 12% max ash	No smoke 1% max ash
7	Cost Saving	Not Applicable	Not Applicable	80% compared to LPG



Fig 1 Wood Stove

Nomenclature

LPG -Liquefied petroleum gas

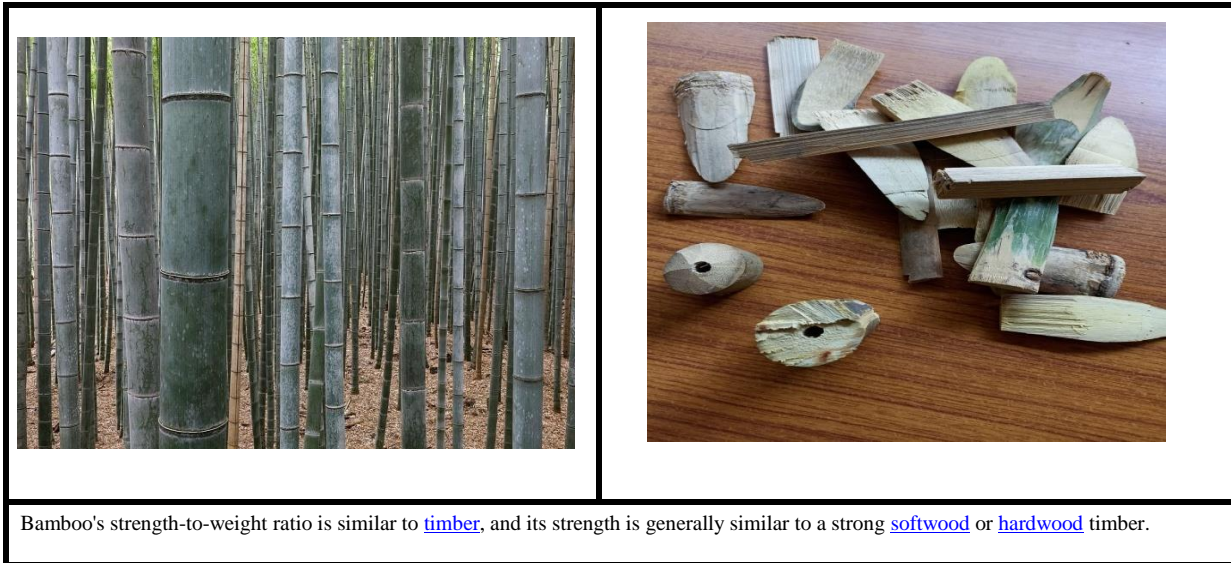
1.BAMBOO WOOD

Bamboos are a diverse group of [evergreen perennial flowering plants](#) in the [subfamily](#) Bambusoideae of the [grass](#) family [Poaceae](#). [Giant bamboos](#) are the largest members of the grass family. The origin of the word "bamboo" is uncertain, but it probably comes from the [Dutch](#) or [Portuguese](#) language, which originally borrowed it from [Malay](#) or [Kannada](#). In bamboo, as in other grasses, the internodal regions of the [stem](#) are usually hollow and the [vascular bundles](#) in the cross-section are scattered throughout the stem instead of in a cylindrical arrangement. The [dicotyledonous woody xylem](#) is also absent. The absence of [secondary growth](#) wood causes the stems of [monocots](#), including the [palms](#) and large bamboos, to be columnar rather than tapering.

Bamboos include some of the fastest-growing plants in the world, due to a unique [rhizome](#)-dependent system. Certain species of bamboo can grow 91 centimetres (36 inches) within a 24-hour period, at a rate of almost 40 millimetres (1+1/2 in) an hour (equivalent to 1 mm every 90 seconds). This rapid growth and tolerance for [marginal land](#), make bamboo a good candidate for [afforestation](#), [carbon sequestration](#) and [climate change mitigation](#).

Bamboo is versatile and has notable economic and cultural significance in [South Asia](#), [Southeast Asia](#), and [East Asia](#), being used for [building materials](#), as a food source, and as a raw product, and depicted often in arts, such as in [bamboo paintings](#) and [bamboo working](#). Bamboo, like [wood](#), is a natural [composite material](#) with a high strength-to-weight ratio useful for structures.





1.1 Tables

Table 2 Lowest access to electricity - Countries and their population

S.NO.	COUNTRIES	% OF THE POPULATION HAVING ACCESS TO ELECTRICITY
1	South Sudan	5.1 % of the population
2	Chad	6.4 % of the population
3	Burundi	6.5 % of the population
4	Malawi	9.8 % of the population
5	Liberia	9.8 % of the population
6	Central African Republic	10.8 % of the population
7	Burkina Faso	13.1 % of the population
8	Sierra Leone	14.2 % of the population
9	Niger	14.4% of the population
10	Tanzania	15.3 % of the population

1.2 Construction of references

From the beginning of civilization wood and biomass are commonly used for cooking. It is observed that over 2 billion people cook badly on inefficient wood stoves that waste wood and subsequently cause health problems and it does not end there, because of the improper use the forest is destroyed. Electricity, gas or liquid fuels are preferred for cooking, but the usage of these depends on the infrastructure and it is not available in all places.

Despite efforts to electrify rural areas, several countries around the world still lack broad access to electricity. Furthermore, many people who have access to electricity must rely on inconsistent and inadequate power. According to statistics, 67 per cent of the developing world still lacks access to power in their homes. Access to electricity has numerous advantages, including a variety of social, economic, and technological advancements.

A French consulting business has launched an energy facility programme in Africa that aims to speed up the construction of rural infrastructure for distributing electricity to the continent's most remote places. Another African project has been a push to install renewable energy systems, such as wind, solar, and geothermal generators, to power rural areas. Table 2 shows the countries that have the least access to electricity and their populations.

RESULTS

Many different Asian cuisines frequently use bamboo shoots as an ingredient. They contain a wealth of nutrients and could help you lose weight more quickly, have better digestion, and have lower cholesterol levels. In future, to implement the larger scale food processing its more useful save the lpg and electricity and also reduce cost.

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