

## Kerosene revisited – excellent fuel for rural households

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All his life Mahatma Gandhi studied and wrote in the light of kerosene hurricane lanterns. These lanterns were always kept very close to him since their light is feeble. How much kerosene-laden vapor he inhaled in his lifetime is anybody's guess. Yet he never suffered from any asthma attacks nor showed any other symptoms of respiratory disease. In fact he also used to apply kerosene to his body as a mosquito repellent!

Yet there is a tremendous tirade by western nations against the use of kerosene as a household fuel and specially kerosene lanterns. As a result the Indian government has also decided to phase out kerosene saying that it is a dirty fuel thereby depriving the poor people of a convenient household fuel.

Every fuel is dirty. It is the way it is burnt that makes it clean or dirty. Thus liquid petroleum gas (LPG), compressed natural gas (CNG) or ethanol become clean fuels only because of excellent combustion technologies available. Unfortunately, during Gandhiji's times and even today the hurricane lantern is an inefficient and unclean combustion device. However if an excellent kerosene based lighting device is developed then it can be a boon to rural poor.

Nimbkar Agricultural Research Institute has recently developed an extremely efficient and clean-combustion kerosene lanstove (combined lantern and cooking stove) for rural households.<sup>1</sup> It simultaneously provides excellent light (equivalent to that from 200-300 W electric bulb) and cooks a complete meal (including bread like *chapattis* and *bhakaris*) for a family of five. Besides it produces 10 liters of clean drinking water. Thus one device provides excellent light, clean cooking energy and clean drinking water.

Lanstove has been tested for the last eight months in 25 rural huts in western Maharashtra which do not have electricity.<sup>1,2</sup> It has shown excellent results with users commenting that it does not produce smoke like their existing biomass powered chulha and gives excellent light compared to the presently used hurricane lanterns and tin wick lamps. The carbon monoxide (CO) levels (measure of how good the combustion is) from these lanstoves are less than 3 parts per million (ppm), whereas those from regular chulhas are between 250-400 ppm or 80 to 130 times more than from the lanstove. Thus lanstove is an extremely clean device and equivalent to LPG stove.<sup>1</sup>

Yet lanstove cannot be spread on large scale in rural areas because of unavailability of kerosene. Today below poverty line (BPL) families get only five liters of kerosene per household every month. Most of the times even this meager amount is not available since kerosene is diverted for adulterating diesel. Nevertheless 5 liters/month is wholly inadequate since this much kerosene can only be sufficient for inefficient hurricane lanterns. Lanstove users need at least 15-20 liters of kerosene/month.

What is therefore needed is an enlightened Government of India (GOI) policy which removes the subsidy on kerosene and allows it to be sold in open market freely. For the BPL families the subsidized kerosene should be made available through the UID card. Once kerosene is sold freely in the open market, it is hoped that it will not be diverted for diesel or other fuel adulteration.

Lanstove has been designed so that kerosene is pressurized and stored in a small separate cylinder from where it flows into the combustor and burns very cleanly just like in the LPG cookstove.<sup>1</sup> This detachable cylinder can be filled up in the kerosene dispensing shops which will be like mini petrol pumps. This filling of kerosene in cylinder will be similar to getting an LPG cylinder charged. The regular users of kerosene will pay the open sale price while the BPL families will pay subsidized price through the UID card. This availability of subsidized kerosene through UID card will be a boon to the rural poor and will allow them to improve their quality of life through availability of excellent light and clean cooking fuel.

Electricity-based lighting is most efficient but it is difficult to see how in near future electricity can be made available in rural India. According to the latest GOI census around 300 million people are without electricity even after 65 years' of independence.<sup>3</sup> Various NGOs, foreign agencies and even government of India departments are therefore promoting solar powered light emitting diodes (LED) lanterns. These lanterns are costly, produce light equivalent to that from 40W bulb, difficult to maintain because the lead acid battery in them fails easily and are energy guzzlers in their production (solar cells consume more energy in their manufacture than they will ever produce in their lifetime). Besides solar lanterns cannot cook!

Recently it has also been shown that [LED light is very harmful to the eyes](#) and produces irreparable damage to retina.<sup>4</sup> On the other hand light from lanstove has a continuous visible spectrum and is like daylight and hence easy on the eyes.

The critics of kerosene lanterns contend that as kerosene is a fossil fuel it's burning contributes to harmful earth warming green house gases. However the fact remains that in last 15 years the [average earth-air temperatures have remained constant!](#)<sup>5</sup> Further an interesting recent scientific study suggests that earth warming is caused [mostly by Chlorofluorocarbons \(CFCs\) emissions](#) rather than those of carbon dioxide.<sup>6</sup> Thus there is a need for rich nations to put their house in order.

The poor cannot wait indefinitely for the western nations to develop cheap renewable energy technologies and give it to them. They need devices now to improve their quality of life and I feel excellent kerosene combustion devices like lanstove and others of similar nature will go a long way in doing so. The best strategy, therefore, is to develop rapidly technologies which make the existing fuels burn efficiently and in an environmentally safe manner.

Besides there are extensive efforts world over to produce kerosene like fuel from agricultural residues so as to make it renewable. I hope these efforts are also

undertaken in India which has huge amount of agricultural residues and huge demand for kerosene as a household fuel.

I am also sure that Mahatma Gandhi, if he was alive today, would have wholeheartedly embraced the lanstove and promoted its use for rural poor.

### References

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