

Solar Rickshaw — Can it Sustain?

I was amused to read the Report, **Soleckshaw—Rickshaw Goes Solar!** by Sukanya Datta (December 2008).

Earlier too there have been efforts to reduce human drudgery by the introduction of motorized bicycles and cycle rickshaws, which were short-lived even though they created sensation. It is proclaimed by the designers that, "The concept of Soleckshaw owes its genesis to the realization that the dignity of human labour needs to be upheld and that all mechanical devices must be designed to decrease human labour and emission of pollutants." But human energy is the best non-pollutant as evident by the use of millions of bicycles in China and India! In designing technologies for social transformation more commonsense is needed rather than technology alone.

One should study the design of manually driven rickshaws in north India. It uses less material and has sloping body (rather than flat). In the design of the bicycle there are two components, one vertical and another horizontal. In the north Indian design the losses in the vertical force are reduced by having sloping body. Also the rickshaw puller has to often drive on rough roads. The trouble with the earlier motor-driven rickshaw was that when sudden brake was applied the rickshaw used to overturn. Moreover the motorised rickshaw needs special tyres (rather than normal ones) which shoots up the cost.

It is claimed that the solar rickshaw is a dual (solar and human) powered one. Still it uses human power, where is the removal of human drudgery?

During the 1977 Indian Science Congress Association annual session at Vizag, our then Prime Minister Mrs. Indira Gandhi commented that the Bullock Cart design which belonged to the previous century needed modification. There were scores of proposals from urban cities and established institutions. Some of the modifications suggested were: reducing the diameter of the wheel, introduction of pneumatic tyres, applying braking system, putting a danger light in the back etc. In the South, the large bullock cart wheel with

wooden frame and iron sheet lining is to safeguard the bullock cart from falling when it passes through mud, water etc., as the centre of gravity falls within the base. The bullock cart goes through sand, rough roads and as such pneumatic tyres may get punctured because of pebbles and thorns.

A string goes through the nose of the oxen and when the



Photo Courtesy: QT Loung/Terragallaria

In the design of the bicycle there are two components, one vertical and another horizontal. In the north Indian design the losses in the vertical force are reduced by having sloping body.

bullock cart driver wants to stop, he pulls the string and the bullock stops due to the pain. We are dealing with a living animal, not a machine to try the braking system. Moreover, during nights the bullock cart driver sleeps off and the oxen negotiate the oncoming vehicles through the light falling on their eyes. The bullocks stop at cross roads unable to decide which way to go. To my knowledge we have hundreds of lorry accidents on the road but not (may be few) bullock cart accidents!!

Solar Photovoltaics (PV) for developing countries is still a far cry because of lower efficiency and exorbitant cost. When solar cells with higher efficiency made of materials like organic polymer, nanocrystalline thin film technology, Cadmium Telluride, Gallium arsenide, Gallium phosphide enter the market, then there could be a future for PV. On the other hand, Solar Thermal Technologies are much cost effective compared to PV.

What is needed is to modernize the existing systems with durable materials so that efficiency goes up. The world-renowned scientist and former Director General of CSIR, late Prof. Y. Nayudamma, who brought in a paradigm shift from "Scientists' Science to Peoples' Science" advocated, "Modernise the Traditional—Traditionalise the Modern".

Dr. A. Jagadeesh is Director, Nayudamma Centre for Development Alternatives, 2/210 First Floor, Nawabpet, Nellore-524 002, Andhra Pradesh. Email: anumakonda.jagadeesh@gmail.com