NEPAL

Solar Cooking with integrated systems - A sustainable approach

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Background

Fuel crisis is an alarming issue all over the world. Everybody needs cooking fuels for cooking food for the family, no matter, people live in mountains, hills, plains, deserts or in caves. But, cooking fuels in any forms - traditional or commercial such as fire wood, kerosene, L.P. gas - are not easily available to the low income community in any parts of the developing world.

Issues

Out of 28 million people in Nepal, 24 million (86%) are depending on traditional fuels – fire wood and biomass as their main fuel sources. Forest area is less than 25% of the total area of the country. In rural areas, people use dried cow dung as fuel mixed with grass and leaves for cooking. Since cow dung is used as organic manures in the farms, housewives are responsible to bring fire wood from the nearby forests spending three to six hrs a day with all sorts of risks just for about 20 to 30 kgs bundle which lasts hardly three days. All these traditional fuels emit a lot of smoke in the mud stoves inviting smoke-borne diseases affecting mostly housewives and children. Since people are depending mostly on fire wood, forest is depleting very fast converting it into a desert and degrading local environment.

Commercial fuels such as kerosene, LP Gas and electricity are not only unaffordable but also inaccessible to the rural people. Firewood collection is a big headache to the housewives as forests are mostly regulated by the community forest users' groups and open for the public use in a month only.

In view of frequent price hiking in fossil fuels (L.P. gas and kerosene), poor supply situation, and lack of introducing alternative energy source, low income groups in Nepal are facing hardships in managing cooking fuels.

Fire wood in Kathmandu is not readily available in desired sizes and it is not allowed to burn in rented houses due to smoke emissions.

Charcoaled beehive briquettes from forest killing plants (wild plants) are very expensive compared to gas and log briquettes from rice husk cannot be used for family cooking, they are mostly used in the hotels for camp-firing.

Beehive and log briquettes are not feasible to produce in urban areas as the raw materials for making these briquettes are not available in the cities. Raw materials for these fuels are available only in rural areas.

Waste generated in urban cities are not used in producing these briquettes whereas municipal waste contains about 70% biomass wastes and 10% paper and packaging wastes from households, schools, business houses and industries from which compact

briquettes can be made very easily without charring and without polluting the atmosphere.

Low income groups in Nepal urgently need some low cost alternative fuel source, no matter wherever they are (rural or urban) for immediate relief of their hardships by mobilizing local wastes and natural resources.

We have about nine sunny months in Nepal, a handful of community uses solar energy for cooking and lighting under the sponsored programs. Otherwise, it is not a priority area for the government or donors to promote solar cooking.

Similarly, we have abundant source of biomass wastes in rural and urban areas treated as economically idled things piling up or burning in the farms all the time. An effective back up energy source as fuel briquettes from these idled piles can be produced locally as low cost fuel for the poor community which not only improve the local environment but also create job opportunity based on local wastes and natural resources especially empowering the housewives. But, nobody is interested to involve in such mini-matters. These are the neglected areas where investors always hesitate to mobilize local resources for economic return.

Solutions

Communities generate a lot of wastes at home, in the garden and in the agricultural farms, such as food wastes, packaging wastes and educational wastes at home, and biomass wastes in the garden and in farms. All these waste materials have their own economic value if they are segregated and reused, renewed or recycled to produce highly efficient fuel source which we call "poor people's fuels". I am sure there will be no hardships to the housewives if they apply solar cooking with other back up fuel source such as fuel briquettes together with heat retaining and firewood efficient stoves. Solar cooking, fuel briquetting and heat retaining can bring a big difference in the livelihood of the poor community if they are strictly applied in their day-to-day life.

Here is a comparative chart of fuel consumptions in average family of four with required fuel and cost as per market price:

Comparative Chart of Fuel Consumptions in Nepal

(Family size 4 - two time's meals – rice, lentils and curry = 15 ltrs water boiling in a day)

				Daily cooking time and fuel cost				
Type of fuel	Water boiling equiva-lent (ltr)	Energy consump-tion for boiling	Unit	Time (hr/ min)	Market price (NRs/k g/ltr)	Daily fuel/ device cost Nrs.	Equiv-alent in US$	Remarks
Fire Wood in Kathmandu	15	6	kg	4	12.00	72.00	0.82	
Kerosene	15	0.75	ltr	3	97.00	72.75	0.83	
L.P. gas	15	0.5	kg	2.5	105.00	52.50	0.6	
Charred Bee-hive Briquettes	15	2	pcs	3	30.00	60.00	0.69	
Compact fuel briquettes (saw dust and paper)	15	1.5	kg	3	20.00	30.00	0.34	
Cooking in two (1m)	15	0		2.5	0.00	19.18	0.22	Daily

solar parabolic cooker @ Rs.7000x2 = Rs.14,000 divided by 365 days								costs of the device only.
Using heat retaining box for two 3-ltrs pressure cookers @ Rs.3500 divided by 365 days	15	0		.45	0.00	9.58	0.10	Daily costs of the device only.

Exchange rate: US$1 = NRs.88.
(updated on 23rd September, 2012)

Progress

FoST has organized solar cooking and solar cooker building training workshops for the students and community housewives time to time since 2004 in Nepal under the Matching Grant Programs of the Rotary International led by our solar cooking friend Rtn. Allart Ligtenberg. We include solar cooking training and devices in all Rotary programs.

Conclusions

Time has demanded to think about the integrated approach of the solar cooking programs linked with other backup energy source and energy efficient technologies such as compact fuel briquettes and heat retaining boxes including escorts in stoves for improving quality of life of the poor community in developing world.

Thanks,


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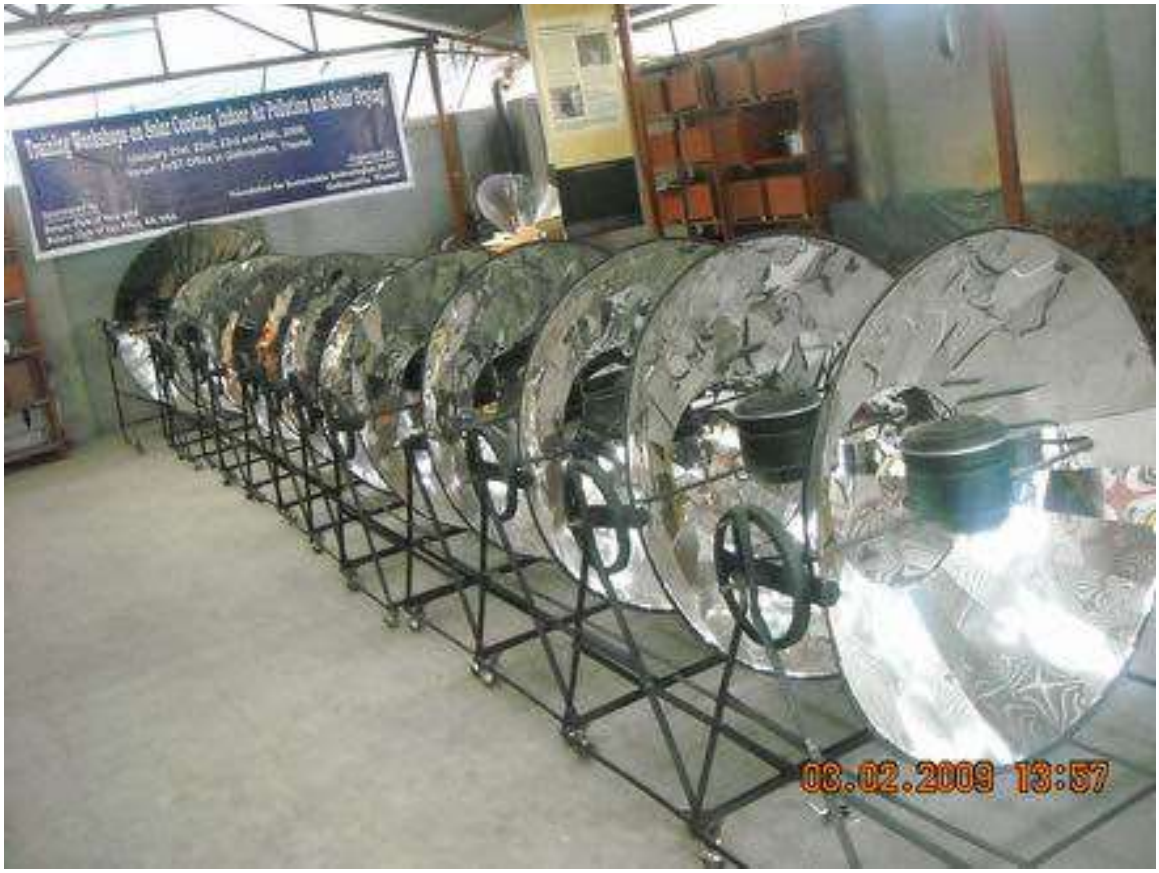
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Produce Fuel Briquettes from Your Own Wastes!

What type of wastes?
Any type of waste paper, cartoon boxes, saw dust, scrap wood, corn wastes, rice husk, fruit wastes, grass, leaves, kitchen wastes, agri- and forest-residues and industrial wastes.

Where to find raw materials?
Residential areas, garden, public parks, schools, colleges, agricultural farms, forest, scrap traders, business houses, industries.

How to process wastes?
Shredding, cutting, soaking, hammering, pulping, pressing and drying.

Where to burn?
Mud stove with one burner, briquette stove, fan operated stove, gassifier stove, rocket stove, room chimneys.

Where to sell the products?
Consumers' market, departmental stores, hotel, restaurants, tea shops, barbeque shops, footpaths, garment, carpet and hosiery industries.

For further information: Contact FoST Office, 4361574

खेर गएका सामानहरूबाट इन्धन ब्रिकेट बनाऔं !

काम नलाग्ने वस्तुहरूबाट ब्रिकेट बनाउन सिकौं !

केबाट बनाउने ?

काम नलाग्ने कागजातहरू, कार्टून बाकसहरू, काठको धुलो, छ्याकन, भूस, उखुका खोस्टा, पात पतिङ्गर, घाँस, कृषि तथा वनका अवशेषहरू ।

कच्चा पदार्थ कहाँबाट ल्याउने ?

कबाडी, व्यापारिक केन्द्रहरू, स्कूल, कलेज, घरबारी, खेतबारी तथा वन-जंगलबाट ।

कसरी बनाउने ?

साना-साना टुक्रा बनाएर, कुटेर, भिजेर, कुहाएर, सड्काएर, गलाएर, भुवादार लेदो बनाएर, प्रेस गरेर तथा सुकाएर ।

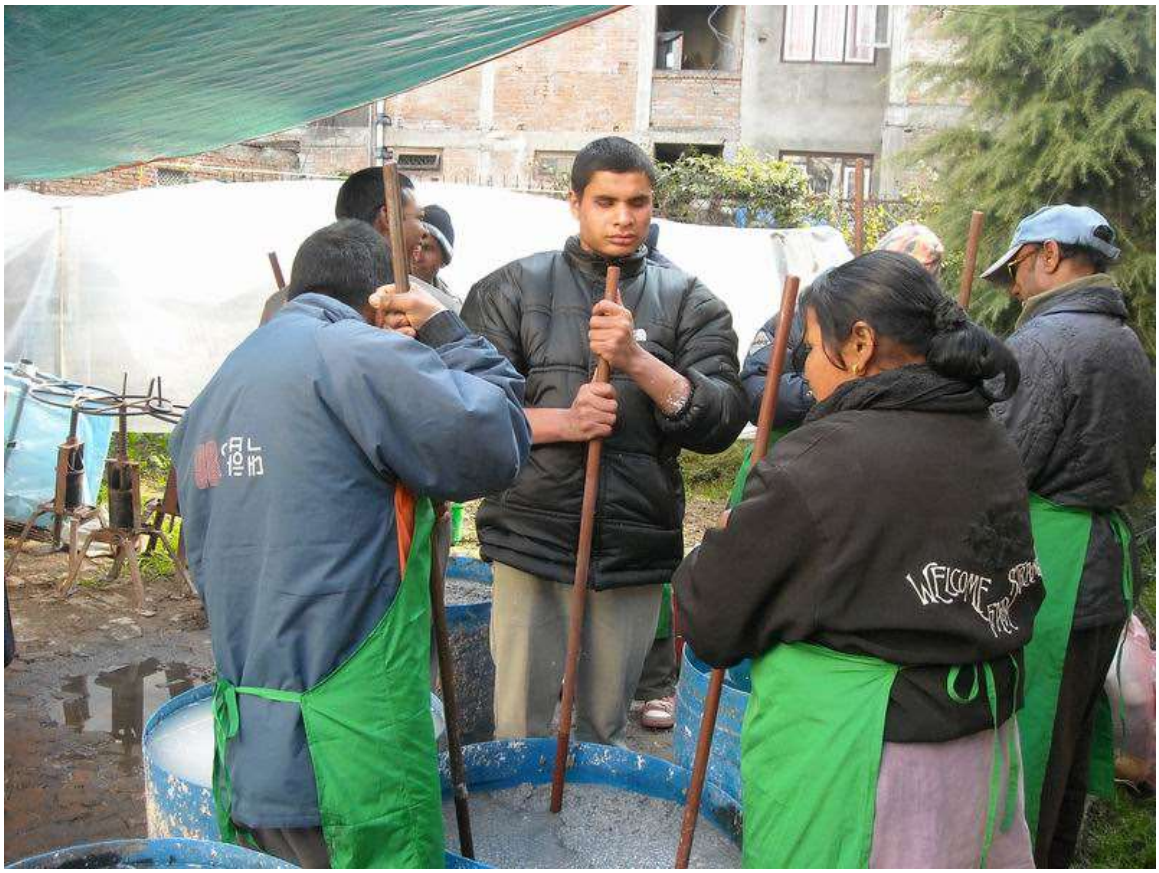
कस्तो चुलोमा बाल्ने ?

माटोको एकमुखे हावादारी चुलोमा, ब्रिकेट स्टोभमा, वायुपङ्खी स्टोभमा, गैसिफायर स्टोभमा, रकेट स्टोभमा तथा कोठा तताउने चुलोमा ।

कहाँ बेच्ने ?

तरकारी बजारमा, किराना पसलमा, ग्यास डिपोमा, डिपार्टमेण्टल स्टोरमा, होटेल तथा तन्दूरी रेष्टुरेन्टहरूमा, फुटपाथको छिया पसलहरूमा, सेकुवा तथा मकै पोल्ने ठाउँहरूमा ।

सम्पर्क: *FoST Office, 4361574*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