Solar cooking and other green technologies Projects in Nepal

Allart Ligtenberg - FAST

Friendly Appropriate Solar Technologies
(a volunteer-only networked group)

View of Planet Earth from Space

Background:

- 1.2 Billion without Safe Water
- 2.6 Billion without Sanitation
- 3.0 Billion in Poverty (less than 2 $/day)
- 3.0 Billion - Cook with Smokey Wood/dung Fires
- 30,000 Children/day die of Diseases, Malnutrition

1979 - First time Nepal

1988 - Met “Champions” Barbara Kerr & Sherry Cole
Primary founders of the solar cooking movement

Inventors of cardboard solar box cooker,
energized and inspired many to change the world

Solar cooking and other green technologies

- projects in Nepal since 1992 -

Sustainable Development - One Village at a Time

Solving problems with solar and other sustainable solutions

HEALTH

WATER

ENERGY

POVERTY

ENVIRONMENT

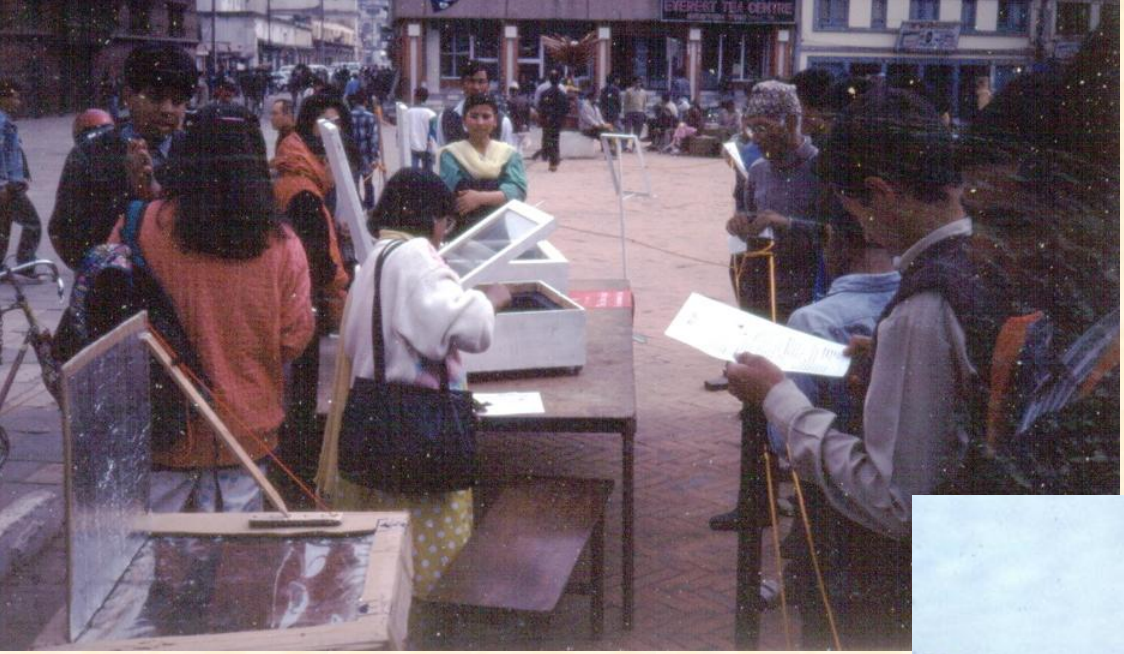
EMPOWER WOMEN &

THE DISABLED

THE PROBLEM:

First Solar Cooker workshop in Nepal 1992 - CRT (Centre Rural Technologies)

Solar box cookers made from cardboard



First public Solar Cooking Demonstration

Basanthapur Durbar Square Kathmandu

Strategy:
Identify local “Champion” organizations/people

FoST (Foundation for Sustainable Technologies), another local “Champion” organization

FoST

Sanu Kaji Shrestha

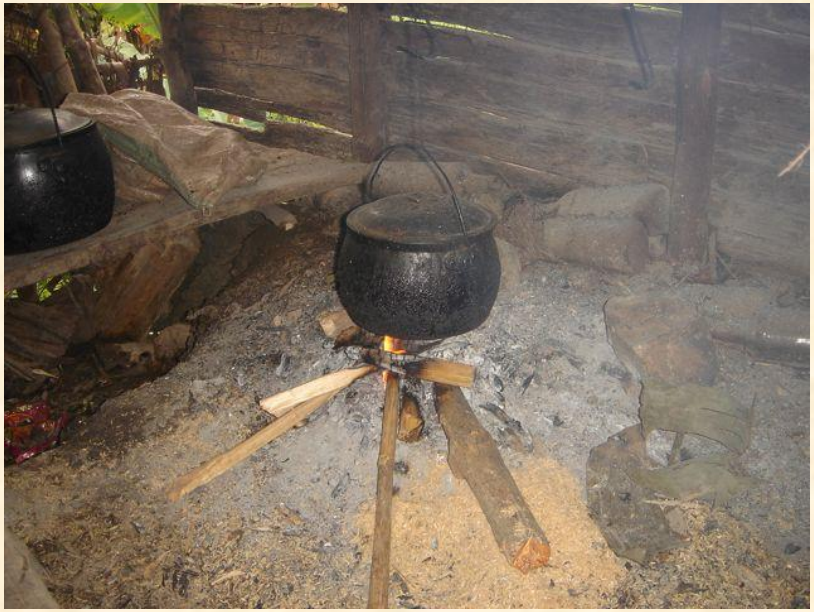
Vajra Foundation/Maarten Olthof - another Champion

Helped Maarten Olthof kick start solar cooking project in Bhutanese Refugee Camps East Nepal 110,000 refugees

THE PROBLEM:

Open fire cooking:

- Indoor air pollution
  lung, eye diseases
- Women, children
- Burn victims
- Inefficient stoves



Burn victims, handicapped for life

Fire danger destroying homes (thatch roofs)

THE SOLUTION:

Solar Cookers solve problems in health, energy, environment, water

"Parabolic" Cooker

Solar box Cooker

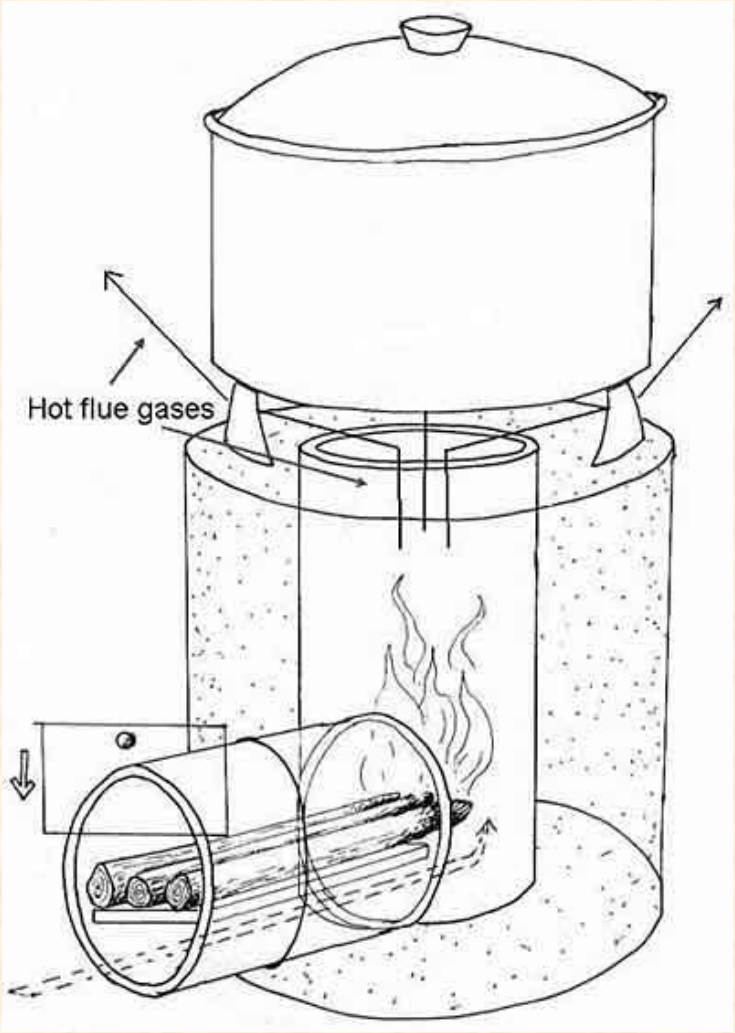
“Scheffler” Solar Parabolic Cooker - 150 meals/day

“Scheffler” Solar Steam cooking - Ladakh
1,500 meals/day

Brahma Kumaris temple - Mt.Abu, Rajasthan, India
38,000 meals/day

“Rocket Stove” - fuelwood efficient stove

THE SOLUTION:



- 3 twigs of wood cook a meal for one family

Rocket stoves

with Heat-retaining box

Heat-retaining basket
ACAP Mustang area

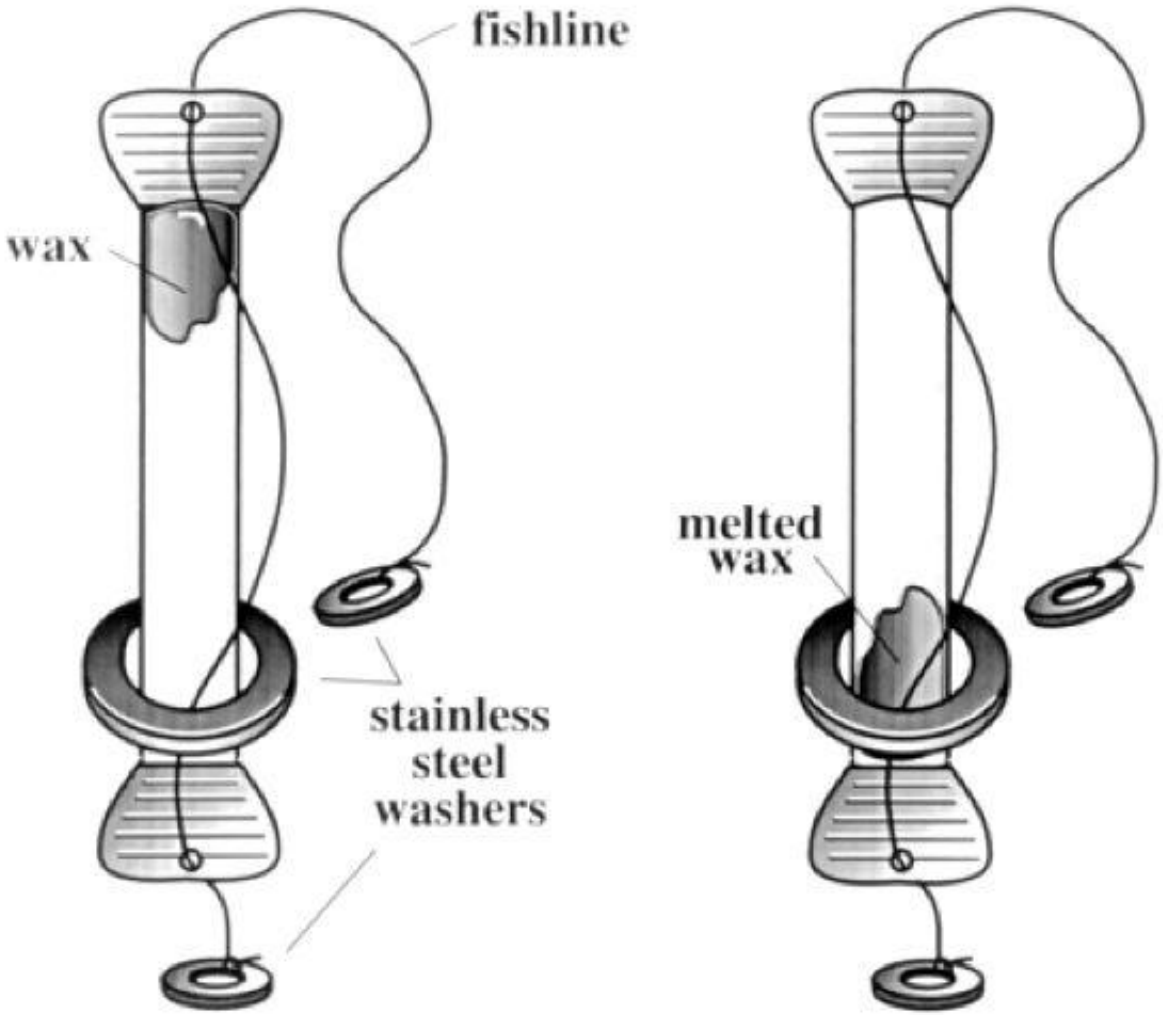
THE PROBLEM:Unsafe Drinking Water

Major cause of death and disease in the world

Temperatures which kill disease microbes present in contaminated water

MICROBE	KILLED RAPIDLY AT:	
Worms ,Giardia, Entamoeba	55°C	131 F
Escherichia coli, Shigella, V.cholera, Rotaviruses, Polioviruses	60°C	140 F
Hepatitis A virus	65°C	149 F

WAPI (Water Pasteurization Indicator)



Wax melts at 9F more than Pasteurization temperature of 149 F

Nepal-made WAPI's:

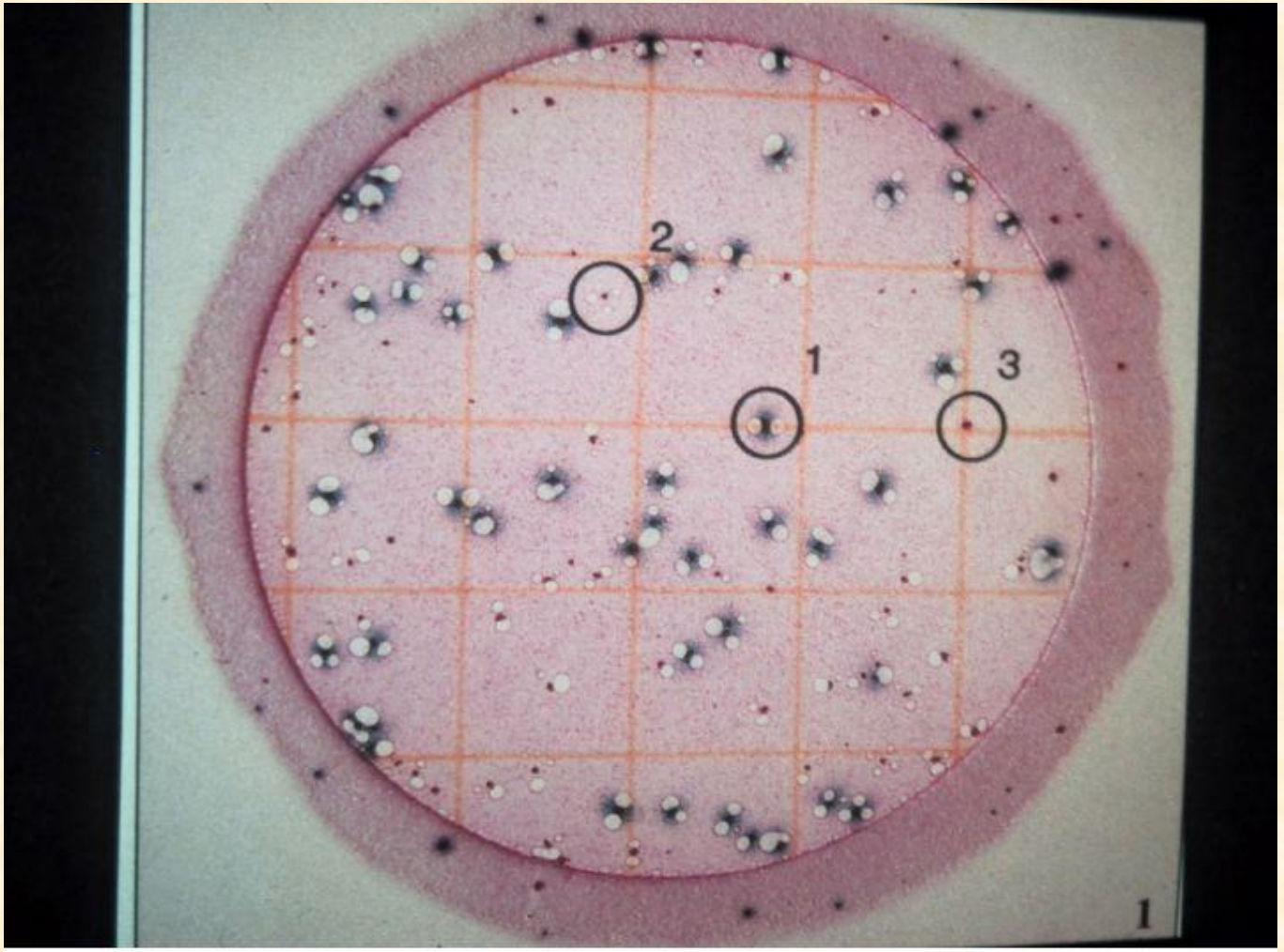
- Clear-plastic cut-up ballpoint pens
- Filled with special wax
- Wax melts @ 9 F over pasteurization temperature

FoST WAPI's

Test drinking water for Coliform/E-coli contamination

IDEXX test tubes

E.coli and Coliform count
Petrifilm plate - 3M Company



THE SOLUTION:

Solar Water Pasteurizers or Cookers

Heating to 149° F (65° C) pasteurizes water, killing all disease-causing microbes (boiling not required)

Water shortage problems

Water delivery trucks

Rainwater harvesting

Solar drying - fruits, vegetables, mushrooms

Improved nutrition
Women can sell high quality products

Different solar dryers

Briquette making - a sustainable energy source

Biomass waste pressed into clean-burning briquettes

Agricultural waste becomes valuable

Briquette making process:

Collect any biomass (grass, leaves, shredded paper, cardboard, sawdust)

Make slush from biomass

Compress the slush in briquette press

Dry the compressed briquettes in the sun, ready to sell

for use in clean-burning efficient stoves

Women become micro-entrepreneurs

- BBC World Challenge Award - with FoST - 2007 -

Solar lighting:

a solution to toxic kerosene lamps & smoky wood torches

Very efficient WLED lights (long lasting)

- Eliminate indoor pollution & danger of kerosene lamps/fire
- Consume only 2 % of the power of an incandescent bulb
- Batteries last longer

Recharge batteries with solar PV

- minimizes pollution of discarded batteries

Solar “Tuki’s”(WLED lights), replacing dangerous, polluting kerosene lights

Solar Tuki’s provide light at night for homework

Villager charges Tuki’s batteries with Solar panel

Village demonstrations

Interviewing women groups

Project meetings with:

- village leaders
- women's groups
- FoST or EWB NGO

Training workshops

Equipment distribution at villages

All devices made locally:

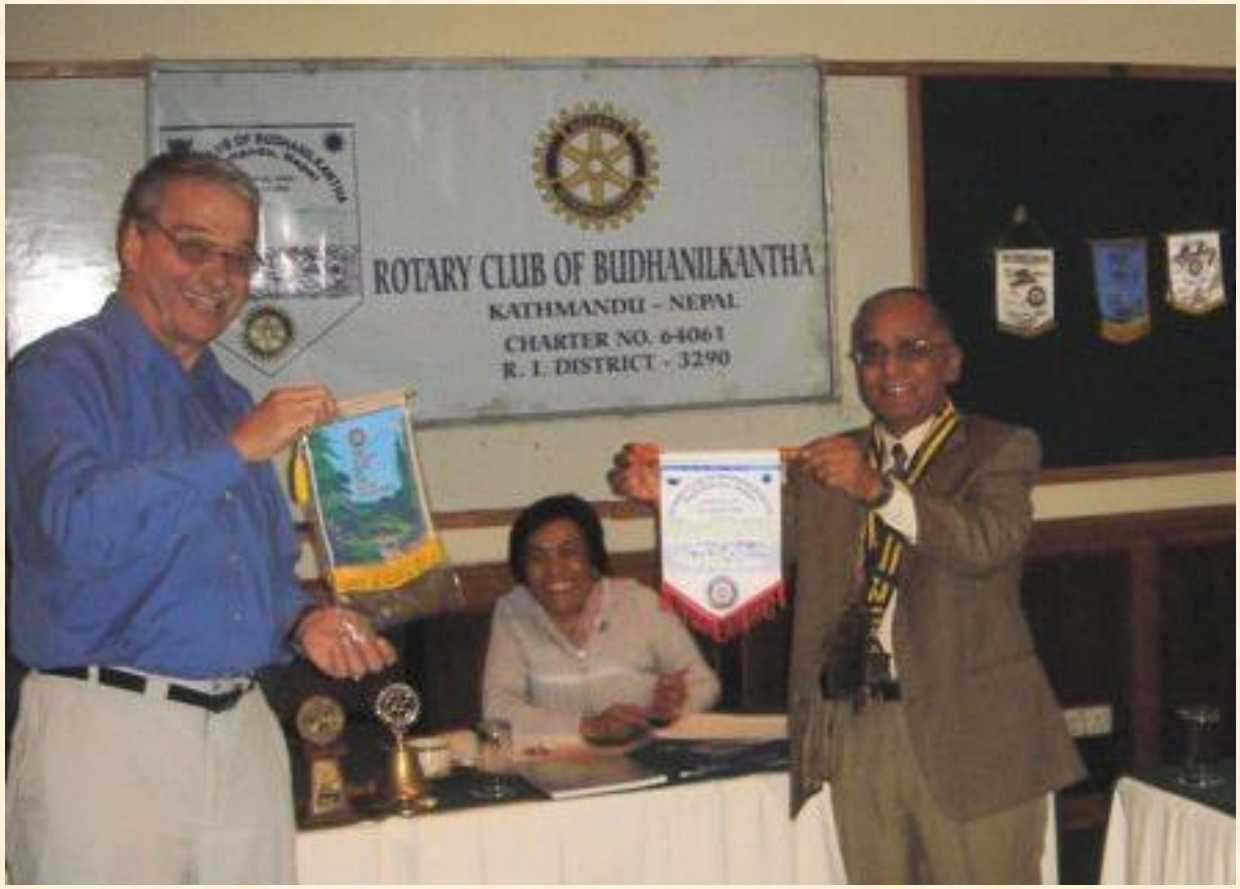
- Creating jobs/small businesses
- Leading to sustainability

Follow up on projects

Nov 2002: joined Los Altos Rotary
initiated 20 Matching Grant projects
Sustainable development - One Village at a time

Partnering with Nepali Rotary Club:

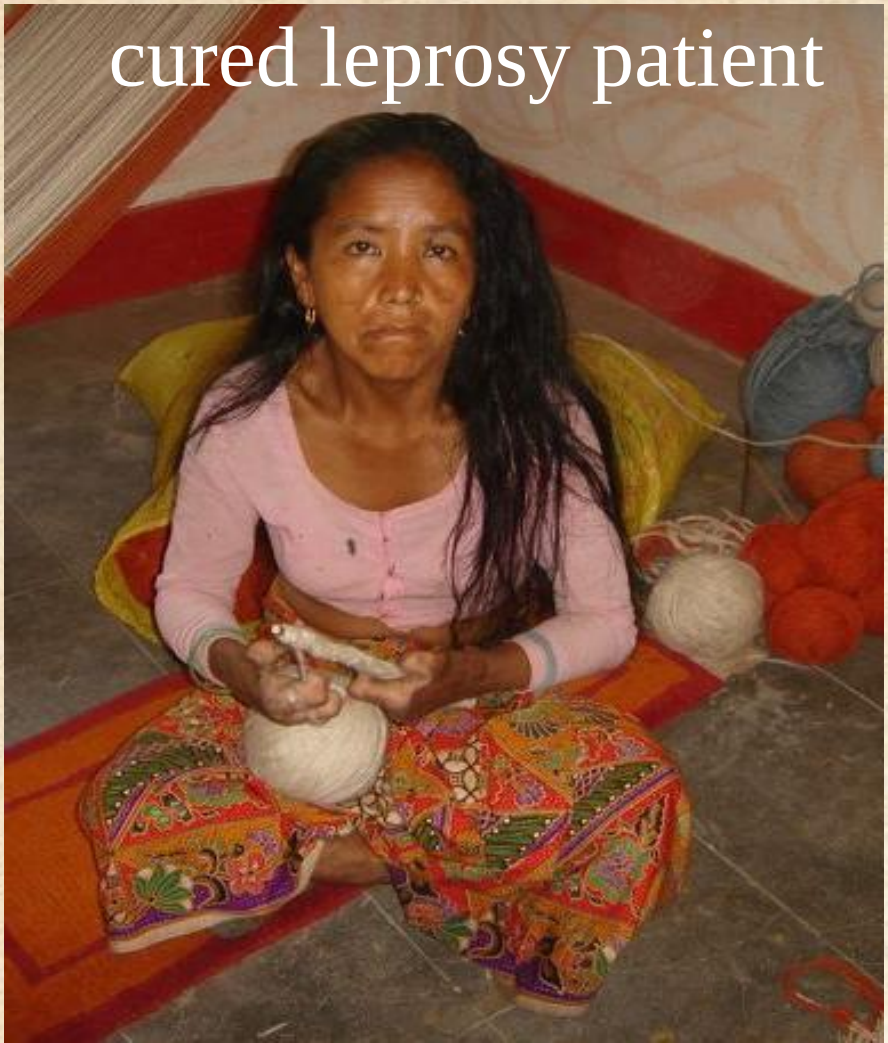
- $4,200 Club cash leveraged into $25,900
- Helping 2100 villagers and disabled groups
- Fighting social stigma of people with disabilities:



- Leprosy
- Blind
- Wheelchair
- HIV/AIDS
- “Lower caste”
- Untouchables
- Extreme poverty

“Shanti Sewa”NGO facilities house the disabled

- Provide income generation
- Improve self-esteem



Produce income by making biomass briquettes

Cut facility cooking fuel costs from $700/month to 0

Special briquette presses to accommodate people in wheelchairs and the blind

The disabled and ‘untouchables’ work at organic farm while solar cookers cook their meals

Big solar dryers for income generation and feeding the disadvantaged

Extending projects to the disabled in Khokana, Kathmandu, Pokhara: $18K

Providing opportunities for the forgotten

- Hope
- Income
- Pride

Briquette workshops at various leprosariums

Leprosy patients now skillful briquette makers

Mentally impaired,

Down syndrome groups,

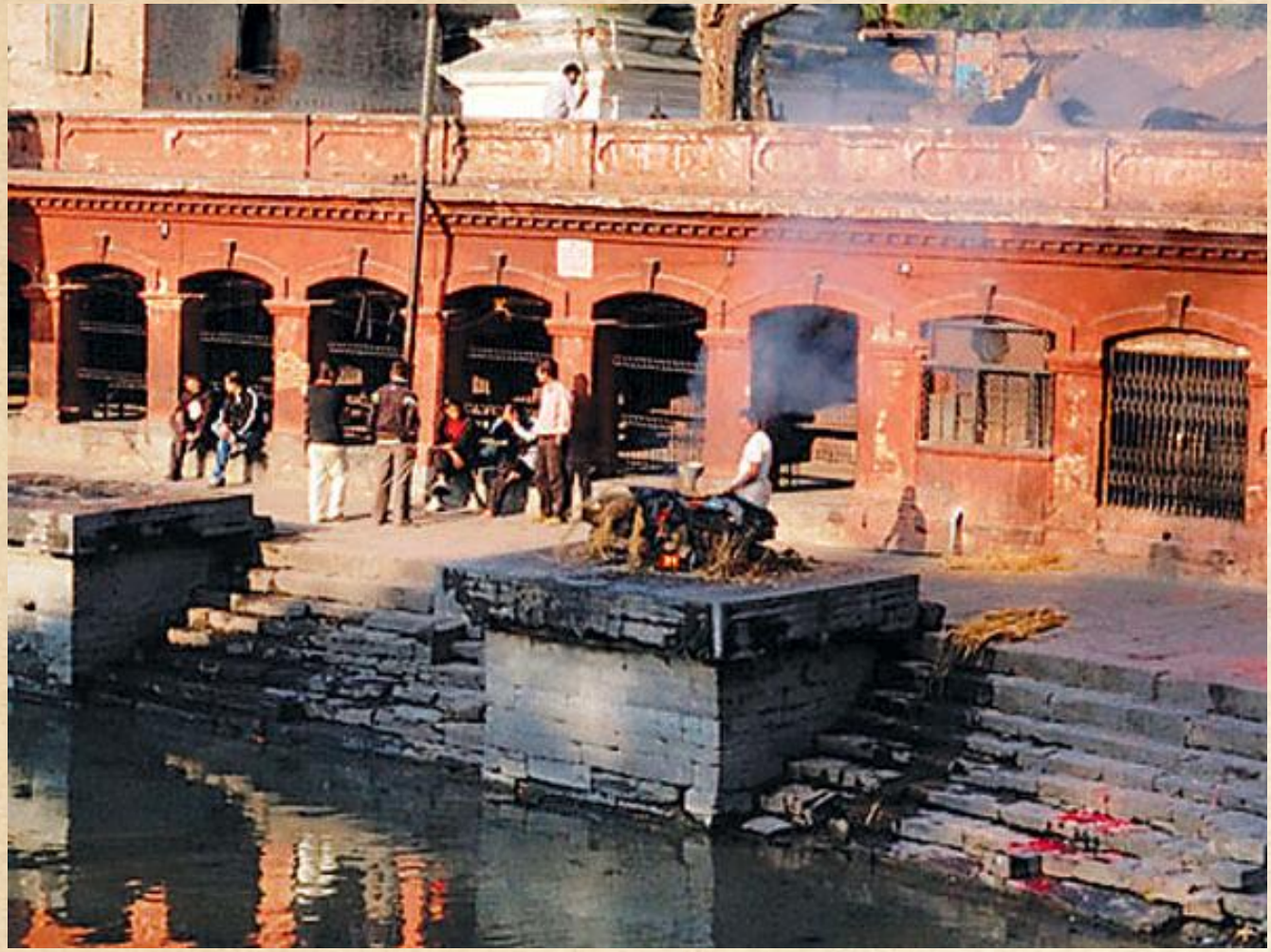
The “poorest of the poor,” less begging in the streets

Income for the Blind

Briquettes, now

sold in super markets

Cremation site at holy Pashupati temple:
Biomass briquettes used to replace wood



Leprosy patients fight the stigma,

making briquettes, and….

weaving mats from plastic & agricultural waste

with pride - made by leprosy patients

Rasuwa/Gatlang Village project $27K

Very poor area has potential for ECO tourism

Same problems, similar solutions

Empower women

+ Install
water pipes,
reduce burden

+ Install water taps

Replace smoky cooking fires with solar cookers and Rocket stoves

Solar cooker training workshop

Reduce poverty: - Start tourist lodging
- Teach vocational skills

Carpentry

Metal working

Distribution of devices to villagers

Rocket stoves

Heat retaining boxes

Solar dryers

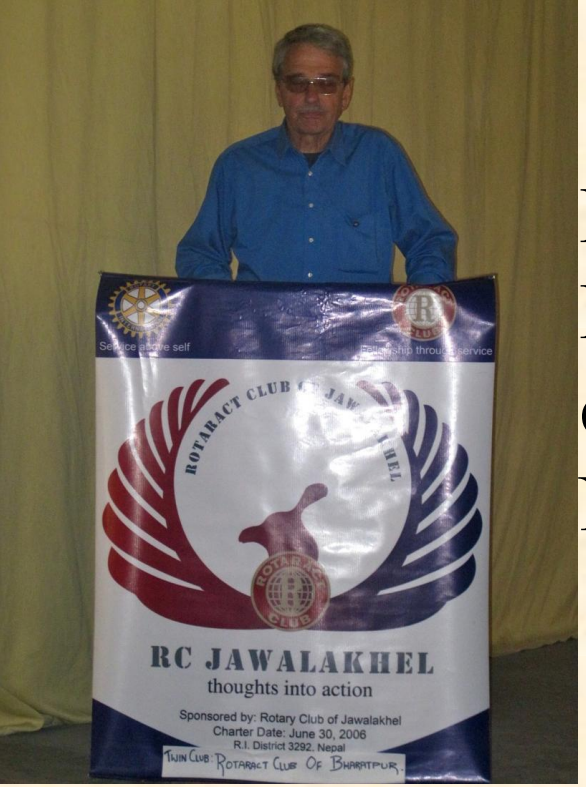
Success:
Villager started a business fabricating Rocket stoves & solar devices

Kick-off school projects (10 schools): on solar/green sustainable technologies

Demonstrate at schools

Teach how to solar cook and pasteurize water…

and make solar water heaters and cookers



Motivate Rotaract clubs of Nepal

"Thoughts into action"

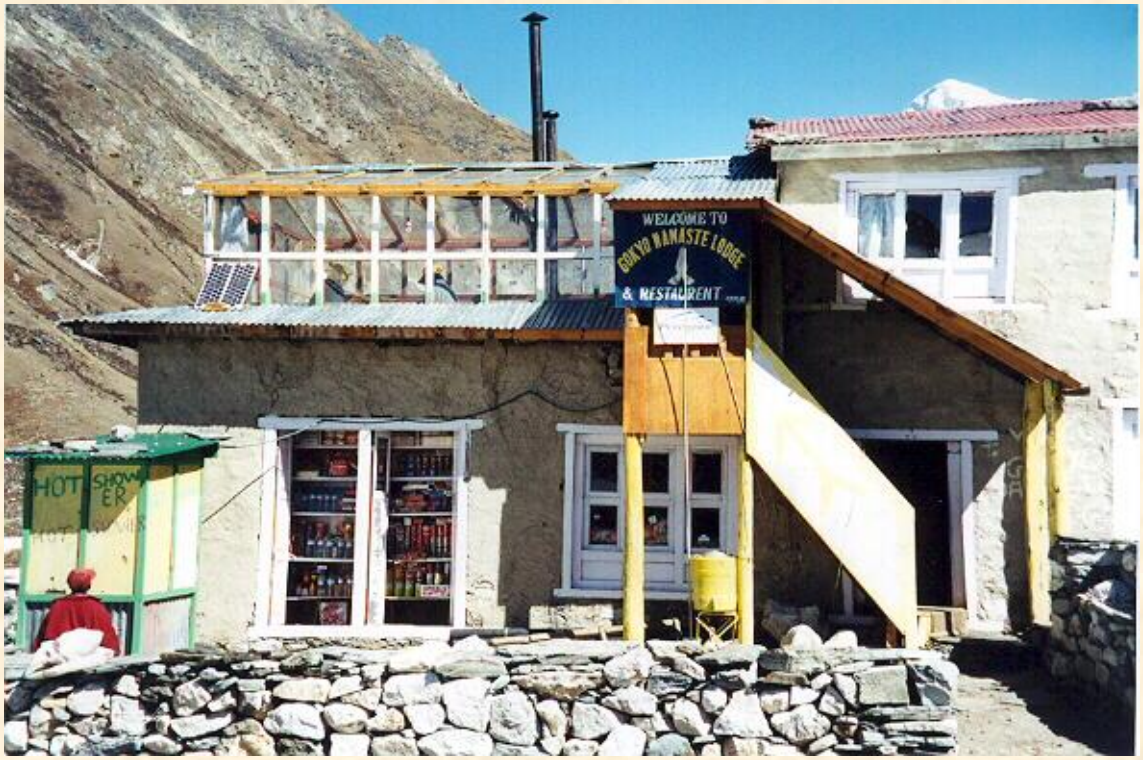
Rotaract clubs make Cookits

Promoting ECO tourism save the environment !

Promote ECO lodges:

Solar space heating

Solar water heating and showers



More savings in fuelwood

Developed:

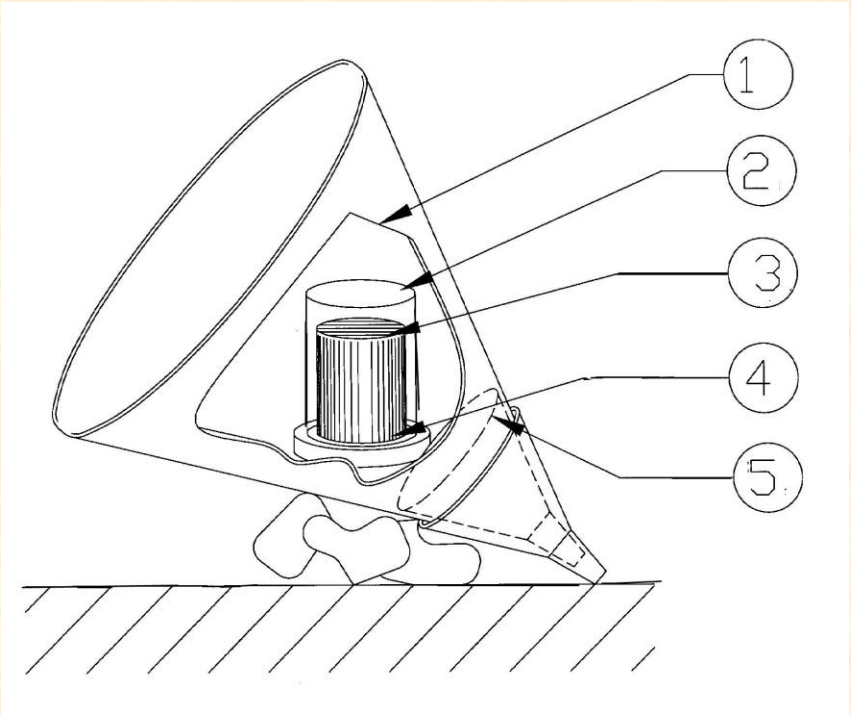
Solar “Everest” cooker

collapsible, parabolic

light-weight: 3 kg

Backpack “Trekkers” cooker, collapsible, 400 gram. A great demonstration tool.

Solar cooking demonstrations in remote areas
Teaching lodge keepers on trekking routes



with
Solar “Trekkers” Cooker


Allart’s Backpack solar cooker summits Mt Everest
May 2008 :)
TITANIUM

Extensive use of SK14's in Annapurna & Everest areas

Vajra Foundation ECO-Resort

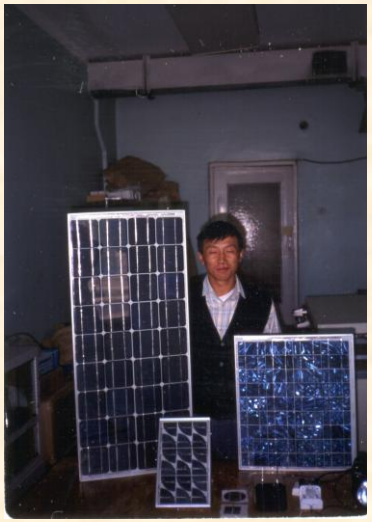
Environment friendly building

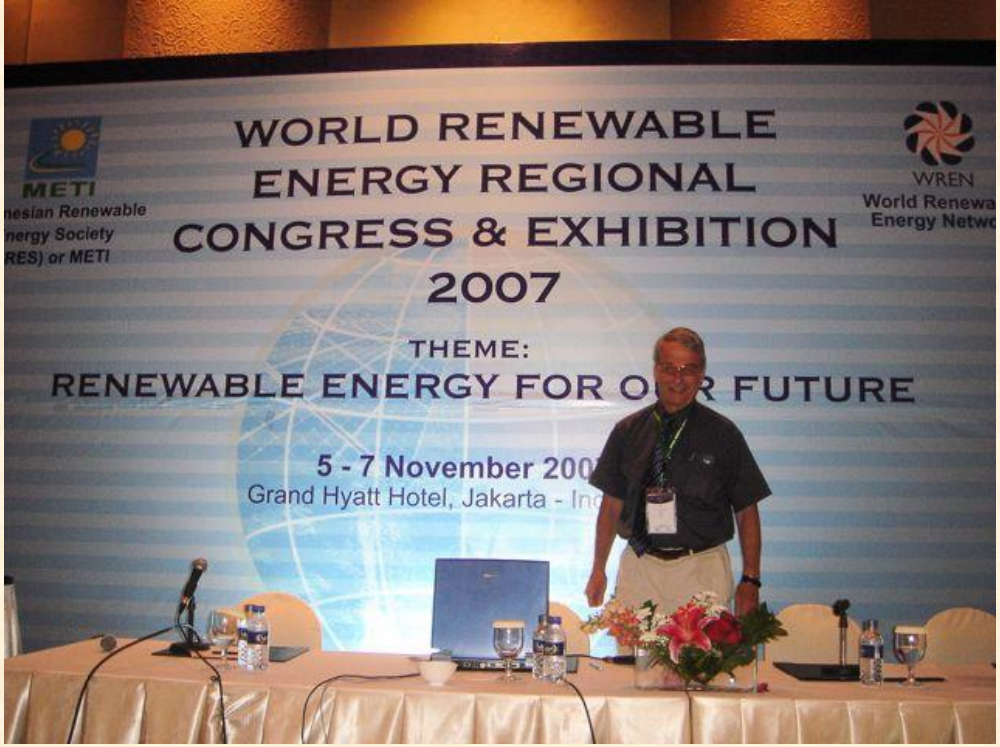
Biogas, Wind, Hydro, PV power
WLED lights
Renewable energy demo center

Biggest Solar cooking dish (43 sq m)
- Deepak Gadhia design

Mongolia projects

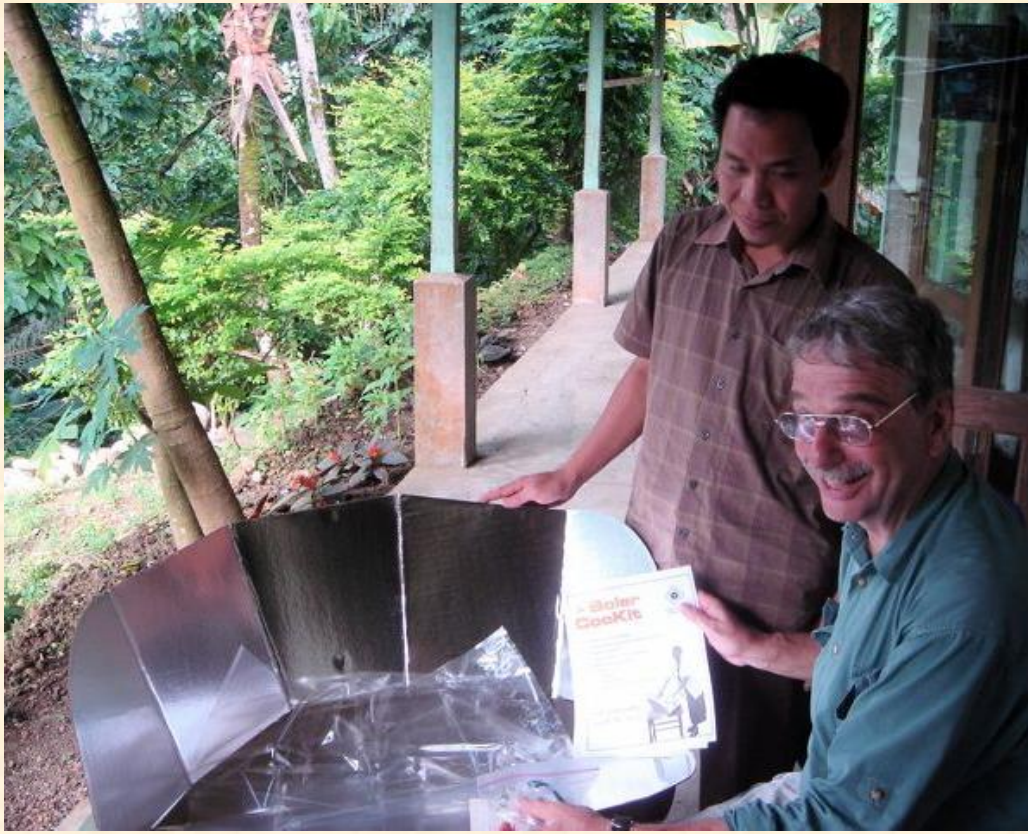
First solar baked bread





Indonesia: Conferences, presentations, and ….

Indonesia:
In the field training



Yukatan Proyecto Itzaes

Everest base camp

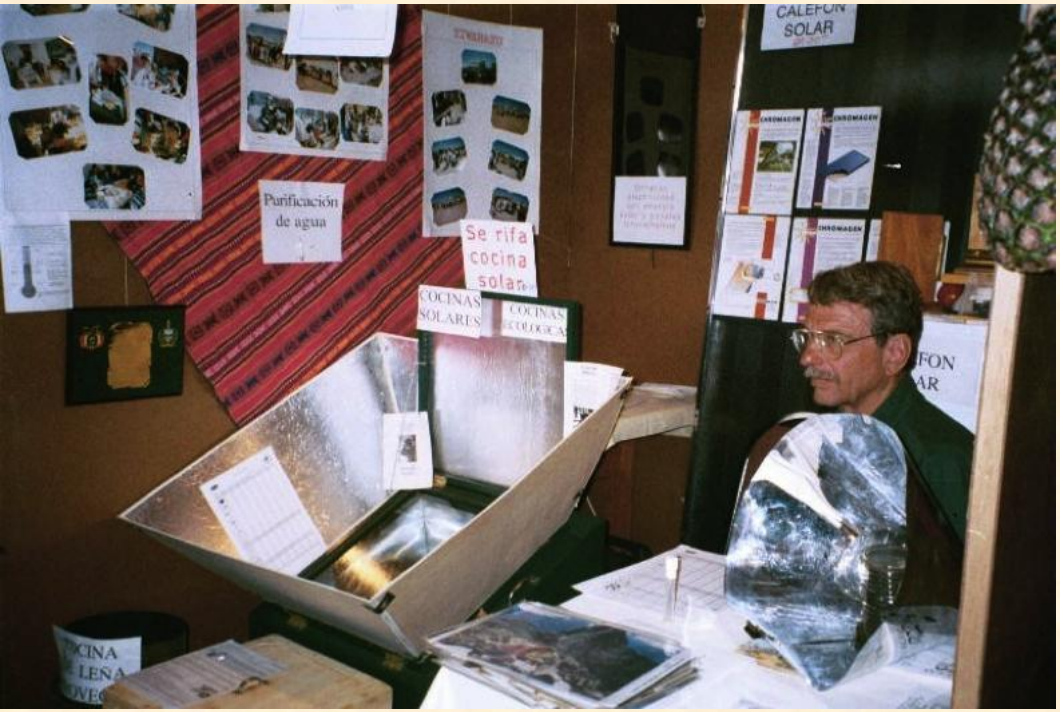
Tibet

Peru workshops

Machu Picchu

solar conferences

Bolivia projects



Chile NGO's networking

And in USA, presentations

and in USA
demonstrations, workshops

Promote Solar cookers & WAPI's for Emergency Preparedness kits in California

- Earthquakes, tsunami's, floods, etc.
- CERT (Community Emergency Response Teams), Red Cross
- Teach high school/elementary school kids how to make/use Cookits

4th grade students - San Jose

High school Interact Clubs workshops:

- “Cookits for Congo”
- Tibet project
- Afghanistan project

Namasteh -Thank you for listening

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aligtenber@aol.com
(650)948-8294
http://solarcooking.wikia.com/wiki/Allart_Ligtenberg

Los Altos Rotary Club
Rotary District 5170 Chair Water, Health, Hunger & Solar

Initiative:
School of Renewable Energy
with EWB/Nepal (Engineers Without Borders):

School of Renewable Energy &

SRESTⓒ

Sustainable Technologies

Teach: Solar/Hydro/Wind/Bio-gas and Small-Business skills, and Carpentry and Metalworking

Vocational training:
Carpentry

Metalworking

Small-business skills

- Students learn to introduce devices to villages
- Households benefit long-term

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