

Proposal of Obscure Design for Concentrator Type Solar Cookers

Solar Cooker Japan
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What is Solar Cooker?

- A form of Solar Thermal Application
- Many types suitable for the usage
 - Panel Type
 - Box Type
 - Concentrator Type

What can be done by SCs?

- One solar cooker is equivalent to 500 to 2000kg/yr of fire-wood.
- Foods can be cooked w/o soot or smoke.
- Water can be pasteurized easily.
- When people are collecting firewood by themselves, they can save valuable time.
- When people are buying firewood for themselves, they can save precious money.

Situation in Japan



S.C.'s as Eduational Material



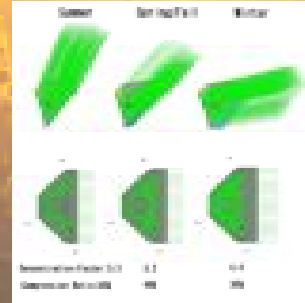
What we brought in

- Karupika (Less expensive version of Kirapika)
- Balloon Cooker (1m and 2m in dia.)
- Simple Concentrator

Adoption of Simplicity and High Robustness Learnt from Solar Cookit by SCI to a Concentrator Type SC

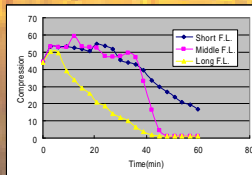


How Cookit can work in Japan



What is desired for the Reflector

1. High Robustness
Avoid long focal length



Robustness of Parabolic Mirrors with different Focal Length. (An Example of Calculated Results)

What is desired for the Reflector

Avoid Point Concentration

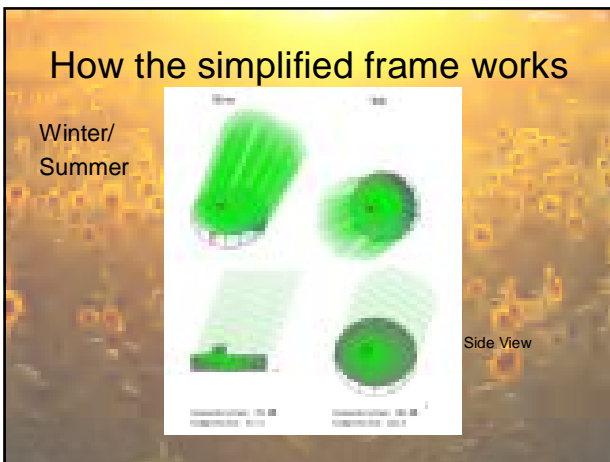
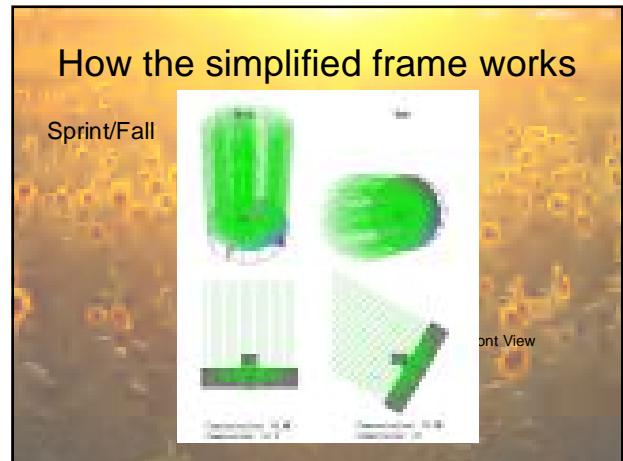
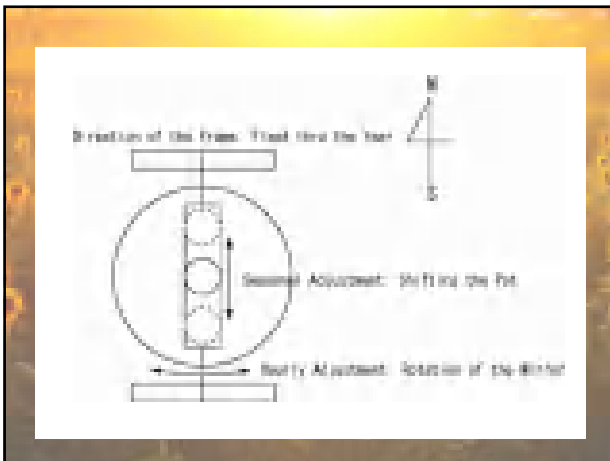
Spherical Mirror

Point-focused Parabolic Mirror



Simplified Concentrator





- ### What we expect
- 2m Balloon w/ simplified frame will work fine at schools or hospitals in Kenya.
 - Simplified reflector, 1m Balloon w/ Simplified frame, or Karupika will do for the families in Kenya.

Production of Bio-Diesel Oil (BDO) and forest restoration

Earth Band LLC
 CEO, Masanobu Yamamoto
 Director, Yuri Mito

- ### Contribution to MDG
- Plantation and BDO project helps
- Eradicate extreme poverty and hunger through bio-diesel oil production
 - Ensure environment sustainability through preventing deforestation and planting *Jatropha carcus* trees
 - Develop a global partnership for healthy development

Clean Developmental Mechanism using BDO

- Emission of CO₂ by burning **Bio-Diesel Oil** never increases the total mass of CO₂ in atmosphere, but decreases the emission of CO₂ by burning **fossil fuel**, which causes the global warming.
- Use of **BDO** contributes to cut down the emission of CO₂ and restrains the global warming

Jatropha Carcus- Promising plants for BDO in Africa

- Jatropha Carcus trees grow in rain fall of more than 600mm, no frost.
Kenya, 400-1,000mm, and Tanzania 300mm, still grow.
- 1 tree generates 3-5kg seeds in Kenya, 6-10kg seeds in South Africa
- One seed contains 30-42% of Oil.
(Metyle Ester: Bio Diesel Oil)
- 2,500 trees can be planted in One (1) ha.
1 tree in 4m²
- Jatropha Carcus grows:
From seed: 2-3 year, From Young shoot: 4-6 weeks

Jatropha planting brings economic benefits

Land area (ha)	1,000	10,000	100,000	1Million
Employment	50 family	500 family	5,000 family	50,000 family
Bio Diesel Oil Production	3,000-6,000t	30,000-60,000	300,000-600,000	3-6 Million
Sales of BOD per Year Yen 70/L	140MKsh-280MKsh	1.4 Bksh- 2.8 Bksh	14 BKsh-28 BKsh	140 BKsh-280 BKsh
Possible CDM Credit	7,800-15,600t	30-60,000	300-600,000	3-6Million
1330 Ksh/TCO2	10.4M Ksh-20.8 MKsh	104 MKsh-208 MKsh	1.04 BKsh-2.08 BKsh	10.4 BKsh-20.8 BKsh

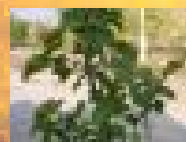
Jatropha Project just started

Nicaragua	1000 ha plantation since 1996 and pilot refinery of BOD started
China	Started Jatropha test in 2004
Ghana	100 ha Pilot plantation started
India	1Million ha started at Jaipur
Egypt	800 Acre (324ha) plantation started in 2004
Mozambique	Planted along pipeline of SASOL
Tanzania	Started to produce 1000kg soup production

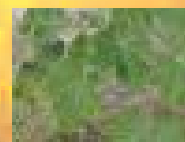
Jatropha Project in Thailand

- Thai Government decided to use Ethanol **19%** for Gasoline by 2011
- Thailand Royal project "Golden Bamboo Foundation started with **800 ha** and Expanding up to **150,000 ha and more**.
- BDO 8.5 ML/day necessary
- BDO 31MKL/Yearly consumed.

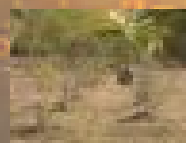
Jatropha Project in Thailand



Jatropha Carcus 2 years



Jatropha fruits



Jatropha fruits



Signboard to indicate

Jatropha Project in Thailand



Jatropha seedlings



Jatropha seedlings

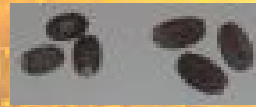


A simple system for irrigation



Tanks for irrigation are in line

Jatropha refinery process



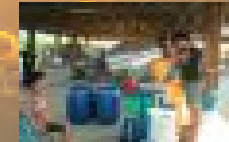
Seeds of *Jatropha curcas*



Squeezing machine



Oil refinery plant



Oil refinery test

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