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– provision of materials and equipment for projects, planning work, selection, purchasing and shipment to the developing countries

– management of all financial obligations to the partner-country.

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Solar Cookers in the Third World

Evaluation of the Prerequisites, Prospects and
Impacts of an Innovative Technology



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Key terms: Solar cooker: technology, diffusion, evaluation, acceptance, projects

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Types of solar cookers**Box-type solar cookers:**

ATDO reflector box type solar cooker
 ATRC solar cooker
 Cocina solar
 Dhauladhar solar cooker
 Indian box type solar cooker
 Kerr-cole solar box cooker
 MECTAT solar ovens
 Mina solar pressure cooker
 Orangi cooking box
 RERI-SEP solar cooking box
 RIIC solar oven
 SERVE solar oven
 Suryamuklu box type solar cooker
 22° solar cooker
 ULOG tropical solar cooker
 ULOG European solar cooker
 Four-mirror cooking box

Reflector cookers:

Advanced reflector cooker for Mali
 Bottom-heated concentrator box
 External concentrating eccentric axis box style solar
 cooker (EEB)
 Falco S/C
 Sobako 1 / SOBA 1
 Sun basket
 Sungril
 Suryakund
 Table-type reflector cooker
 Tube solar oven
 Valparaiso reflector cooker
 VIAX solar cooker SK 10

Heat accumulating solar cookers:

Heat accumulating steam cooker
 ISE solar cooker with integral oil storage
 Solar hot plate cooker
 Heat pipe storage solar cooker with evacuated tube collectors

Convective cookers:

Convective solar cooker (CSC)
 Steam immersion heater solar cooker

Comparative survey:

Synoptic comparison table of solar cookers

Symbols and Units

A	aperture, area of incidence	m^2
a	air permeability coefficient	$m^3/(h m Pa^2/3)$
b	breadth, width	m
c	specific heat capacity	$kJ/(kg K)$
CC	cost of cooking, price of energy per kg of food cooked during the first year	$\$/kg$
CCL	cost of cooking with respect to the lifetime, price per kg of food cooked over the lifetime of the cooker	$\$/kg$
d	depth	m
G	global irradiation	MJ/m^2 ; kWh/m^2
G', g	global irradiance	W/m^2
H	diffuse (sky) radiation	MJ/m^2 ; kWh/m^2
H'	specific enthalpy	kJ/kg
$\Delta H'$	differential specific enthalpy	kJ/kg
h	height	m
L	useful lifetime in years	a
l	length	m
l_i	length of joint i	m
m	mass	kg
n	number of meals cooked per day	1
P	purchase price	$\$$
PEL	lifetime price of energy	$\$/kWh$
p	pressure	Pa
Δp_i	pressure drop across joint i	Pa
Q'	thermal output power	W
S	direct (beam) radiation	MJ/m^2 ; kWh/m^2
T	temperature	$^{\circ}C$
ΔT	temperature difference	K
$\Delta T'$	temperature interval of the cooking process	K
t	time, cooking time	s, h, d, a
U	heat transfer coefficient	$W/(m^2K)$
V	volume	m^3 ; l
V'	volumetric flow	m^3/s
α	absorptance	1
η	efficiency	1
η'	efficiency of energy-collecting components	1
λ	wavelength	μm
ρ	density	kg/m^3
τ	transmittance	1

Indices

A	aperture
i	counting index
J	joints
L	loss
Opt	optical
U	useful
W	wall