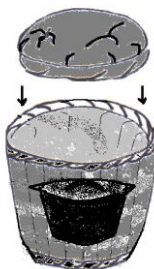
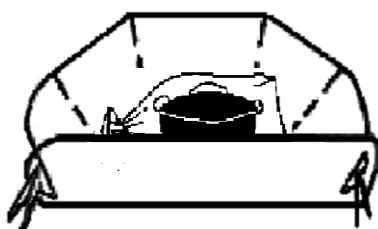


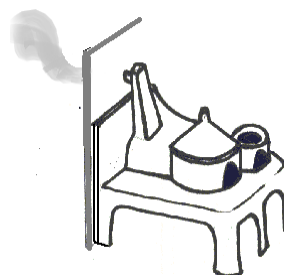
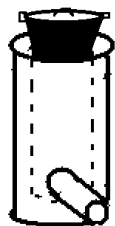


HOW TO USE Integrated Sustainable Solar Cooking (ISSC)

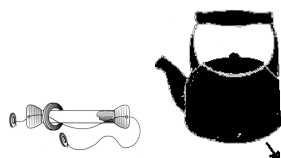
ISSC MANUAL FOR INSTRUCTRESSES AND TRAINERS



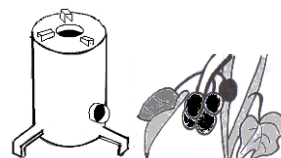
1 Solar Cookitset and 1 Heat-retention hay basket



1 Rocket stove and/or 1 Awra Amba Stove



***Water Pasteurisation
Indicator (WAPI)***



Jatropha cooker (in development)

You have to pay for solar cookers and fuel saving stoves, BUT

- After a short time you can save and earn money by using very little firewood;
- You will save time by collecting much less firewood;
- Your and your baby's health will improve by using this 'New Cooking' (Cookit, Heat-retention hay basket) causing no or hardly any smoke (Rocket and Awra Amba stove). You will save your environment

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Lianne Faili : English translation

Other sources:

Solar Cookers International, Sacramento, California, U.S.A.
www.solarcookers.org www.solarcooking.wikia.com
KOZON Wageningen, The Netherlands www.kozon.org

1. HOW TO USE THE SOLAR COOKIT

The **Solar Cookit** cooks good meals, stews, meat, fish, vegetables, eggs, everything but stir-fry. Is safe for children, is convenient and stores flat.

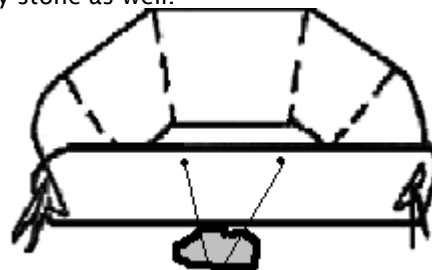
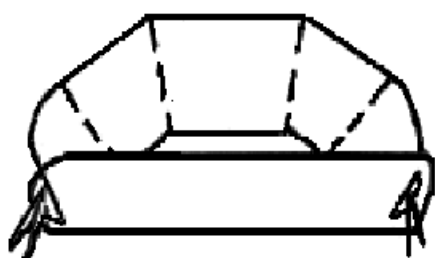
1.1. Cookit set

To cook and pasteurise water in the Solar Cookit you need:

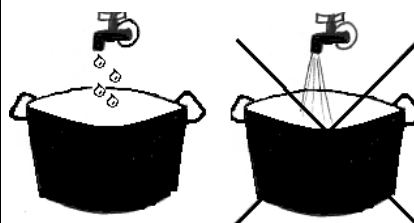
	<ul style="list-style-type: none"> • Reflecting panel • 2 clothes pegs
	<ul style="list-style-type: none"> • Heat-resistant plastic bag • two strings • one pot stand • lightweight 4 litre black pan (or painted black) with lid (or a jar)
	<ul style="list-style-type: none"> • WAPI (Water Pasteurisation Indicator). • black painted 3½ litre water kettle
	<ul style="list-style-type: none"> • rubber band
	<ul style="list-style-type: none"> • cotton bag

1.2. The start

To set up the COOKIT, lay it flat with shiny side up. Fold front round part. Fold back part and pull ends forward to fit into slots in front. Close with clothes pegs left and right. On windy days, place rocks in the outer corners. If extremely windy, tie it down with a heavy stone as well.



Put FOOD into BLACK PAN with lid



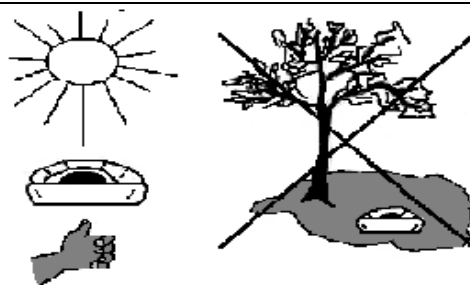
Add NO water to fresh vegetables and meats. For most other food, add the usual amount of water. If it turns out too dry or too moist, next time add more or less water. (When making sauces add more water)

Put the pan on the POT STAND (wood or stone) into heat-resistant plastic bag to hold air all around and under pan.

Close the bag with a string, not too tight so that air can escape.



- Place the COOKIT into a sunny spot out of the wind.
- Orient shiny side toward the sun in the morning.
- Adjust front panel with the clothes pegs so that there is a small shadow under it (higher midday, lower early and late in the day).
- While putting the pan into or taking it out of the CookIt, stay in front of the COOKIT to create a shadow, avoiding glare in your eyes.

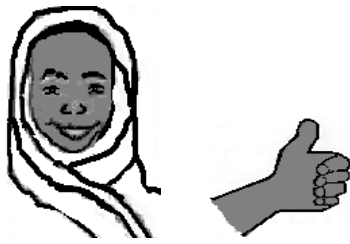


After cooking:

- Turn plastic bag inside-out and use clothes pegs to hang it up to dry.
- Fold up the COOKIT.
- Put in cotton bag and hang up on a nail inside the house.



1.3. Cooking speed



OK

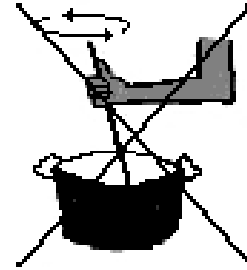
Sun high in the sky	
No clouds	
No wind	
A place sheltered from the wind	
4 litre lightweight pan, painted black	
Small pieces	
Little or no water added	



NOT OK

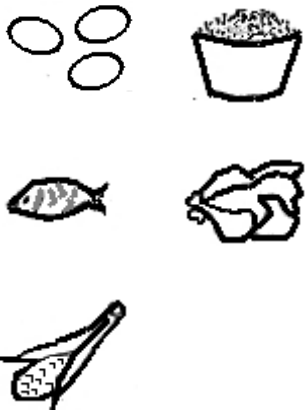
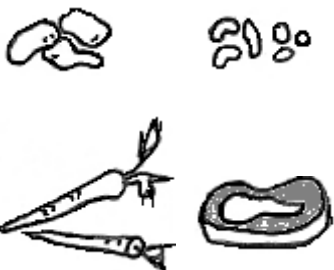

To cook under any of these conditions you may need to preheat food on a fuel-saving stove before putting it in the CookIt to finish OR partly cook it in the CookIt, then quickly finish it on a fuel-saving stove or in a heat-retention basket.	
Sun low in the sky	
No sun	
Rainy	
White or shiny large, heavy pot	
Large quantity Large pieces	
A lot of water	

1.4. Cooking hours

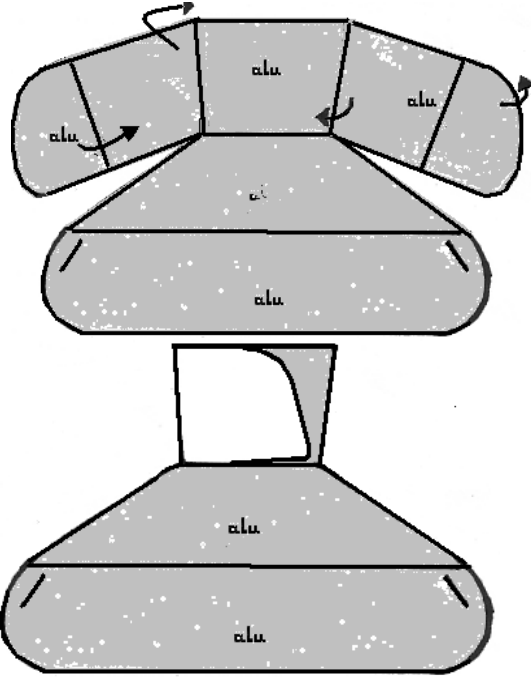


- Start early, allow several hours
- Use a heat-retention hay basket every day to keep your food warm, or to continue the cooking (rice, porridge, sauces, beans, meat).

Approximate cooking times for 4 pounds (2 kilos) of food on a sunny day:

<p>EASY TO COOK</p> <p>Eggs Rice</p> <p>Fish Chicken</p> <p>Porridge, sauces, baby food, bread, cakes</p> <p>Vegetables (above ground)</p>	 <div> </div> <div> <p>1 – 2 hours</p> </div> <div> </div>
<p>Potatoes</p> <p>Vegetables (roots)</p> <p>Some beans, lentils (soaked)</p> <p>Most meats</p>	 <div> </div> <div> <p>3 – 4 hours</p> </div> <div> </div>
<p>HARDEST TO COOK</p> <p>Pieces of beef</p> <p>Most dried beans</p> <p>Soup and stew</p>	 <div> </div> <div> <p>5 – 8 hours</p> </div> <div> </div>

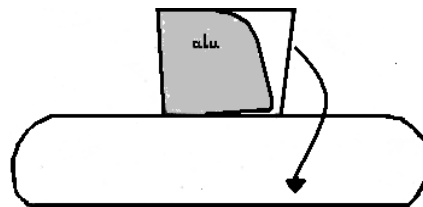
1.5. Folding instructions



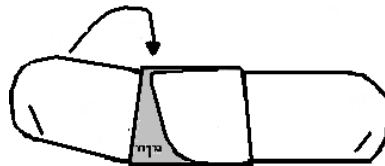
Small left part forward
Whole left part backward

Small right part backward
Whole right part forward

Close big part forward



Close small part towards big part



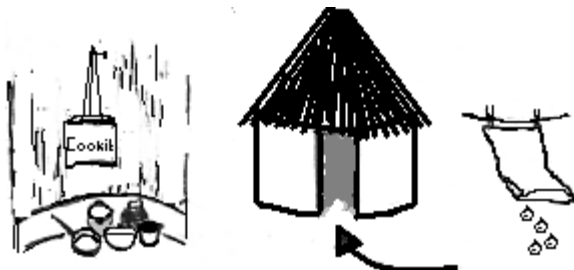
Fold left wing backward



Fold right wing backward



Put rubber band around the
folded Cookit
Put Cookit in cotton bag



Hang cotton bag in dry place

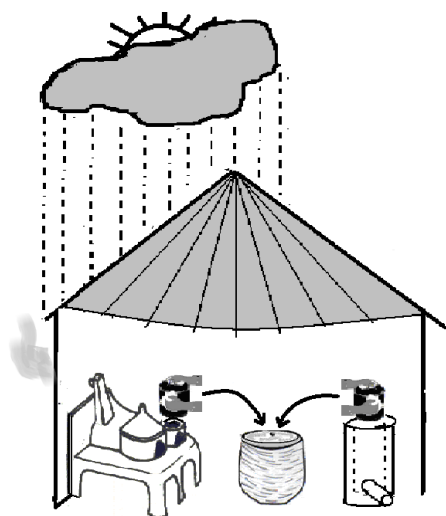
2. HOW TO USE HEAT-RETENTION HAY BASKET or THERMAL BOX



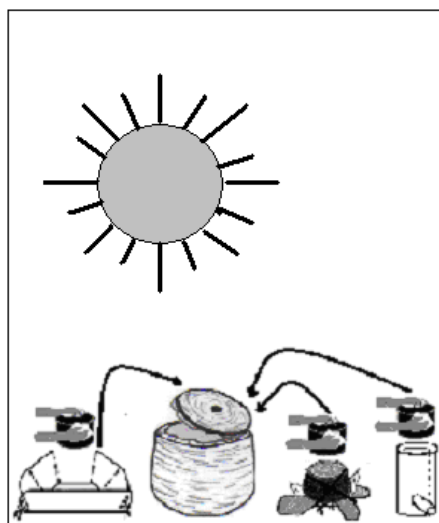
- The heat-retention hay basket or thermal box is a very useful cooking appliance and is of special importance in saving wood as fuel for daily cooking.
- The heat-retention hay basket or thermal box keeps cooked food warm for 3 hours or lets the cooking process proceed by putting the pan with food into a well-insulated basket or box.

2.1. What you need

Depending on the size of the pan needed, adapt the size of the basket or box. For a 10-litre pan a very large basket or box is needed. For a small saucepan, you can use a smaller basket or a shopping basket insulated with woollen rags or pillows.



Cloudy or rainy weather



Sun high in the sky

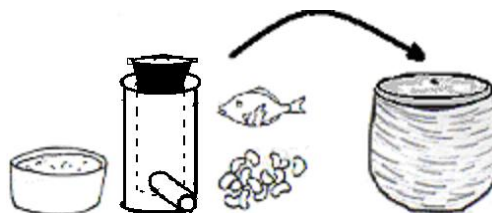
- Reduce cooking time in solar cooker or fuel-saving stove or 3-stone fire by putting pan/kettle in basket.
- Then you can use the solar Cookit for other food or water/milk
- Use the insulated basket ALWAYS and EVERY DAY.

2.2. How to use a heat-retention hay basket?

- *Use a heat-retention hay basket for all food and pasteurised milk:*
Cook food in solar Cookit (or solar box), take pan out when the food is ready and keep it warm in the basket / box for 3 hours.
- *Use the basket for rice, some easy beans, fish, baby porridge, etc.:*
Cook for a very short time on Rocket stove or in Cookit, put the pan with food in basket / box. The cooking process continues in the basket / box. The food will be delicious.




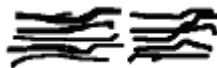






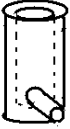


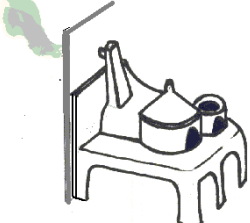

keeps food warm for 3 hours



beans, fish, porridge cook very short and continue in basket.

2.3. To earn money by saving wood

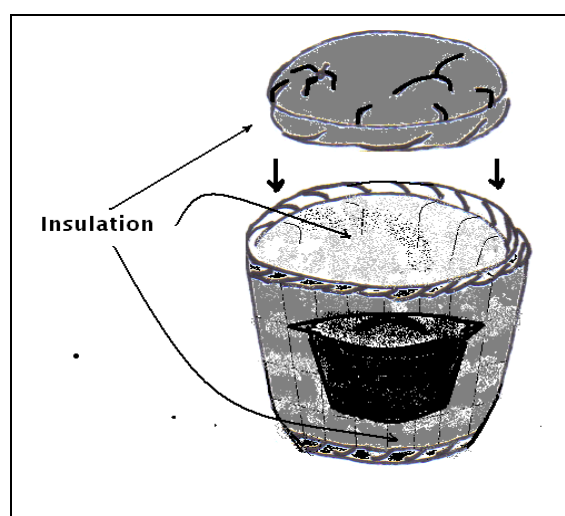
You earn money by using a basket / box in combination with a solar cooker or a fuel-saving stove.

Cookers	Pieces of wood	
		10
 + 		5
 + 		0
 +  + 		2
		4

2.4. To buy a basket

Most of the time plain baskets are for sale in the local market, traditionally made by local basket experts. One has to consider whether the size of locally manufactured baskets is convenient for the pans. Use the same pan for the CookKit as for the basket: 4-litre pan.

2.5. How to make an heat-retention hay basket.



- **Layers of woollen cloth or a blanket**, with a pillow at the bottom and on top. Put the pan inside and place the pillow on top.
- Locally available **grass, banana leaves, straw, chicken feathers**, etc.
- Combination of **sponge, black plastic, grass, old newspapers**.
- In a box, use enough straw / grass to cover the pan on all 6 sides / all around.
- **Note** : Insulation should cover all the sides of the basket / box! Always use a pillow on top of the pan/kettle

2.6. To start up small business



Women can start up small businesses by manufacturing the insulation and sell the heat-retention baskets in the local market.

Women are often very creative and skilled to do this!

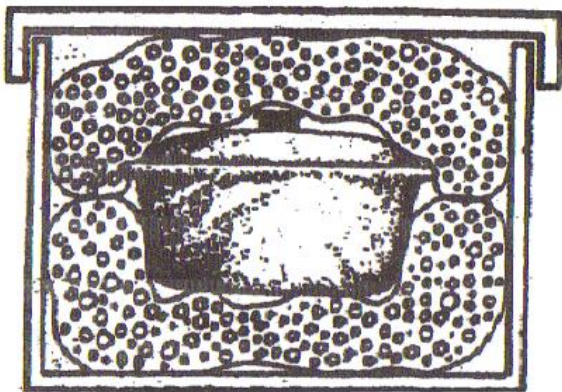
This is an **Income-generating activity**.



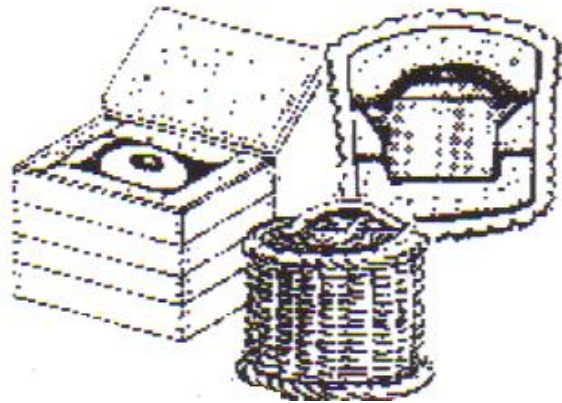
Basket KoZon (www.kozon.org)



Basket KoZon



Box filled with grass



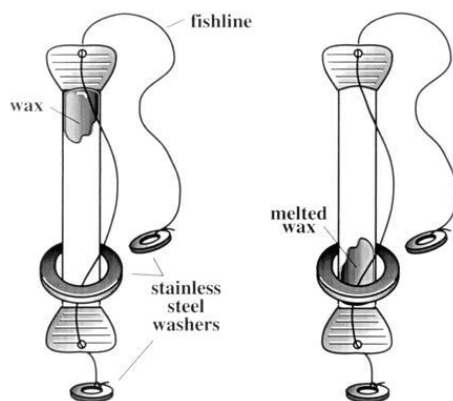
3. HOW TO USE THE WAPI

Safe drinking water and baby care



3.1. What is a WAPI?

A **Water Pasteurisation Indicator (WAPI)** is a simple thermometer that indicates when water has reached pasteurisation temperature and is safe to drink. Pasteurisation destroys all microorganisms that cause diseases from drinking contaminated water and milk.



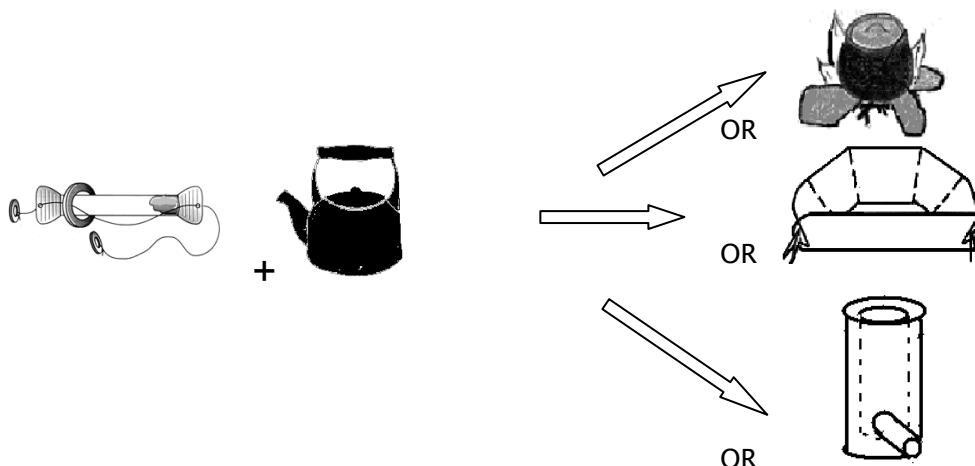
A small plastic tube contains wax that melts when water or milk is heated enough to be pasteurised (65°C/149°F). This saves much fuel by eliminating the need to boil water or milk to ensure that the pasteurisation temperature has been reached.

The WAPI has a stainless steel washer around it to keep it at the bottom of the water kettle. Since top water temperatures are often 2-5°C hotter than bottom water temperatures, lower WAPI placement helps to further insure that pasteurisation conditions have been achieved.

3.2. What do you need to pasteurise water?


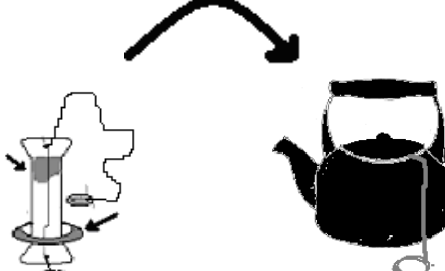

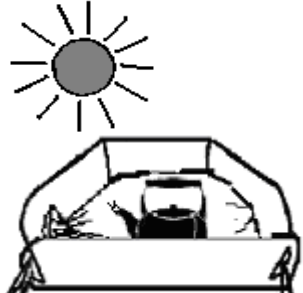
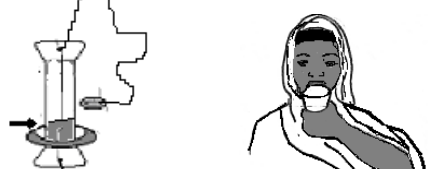

To pasteurise water you need:

- a **WAPI**,
- a **black painted water kettle** (or black painted bottle or jar),
- a **CooKit** (or fuel-saving stove, or 3 stone fire)

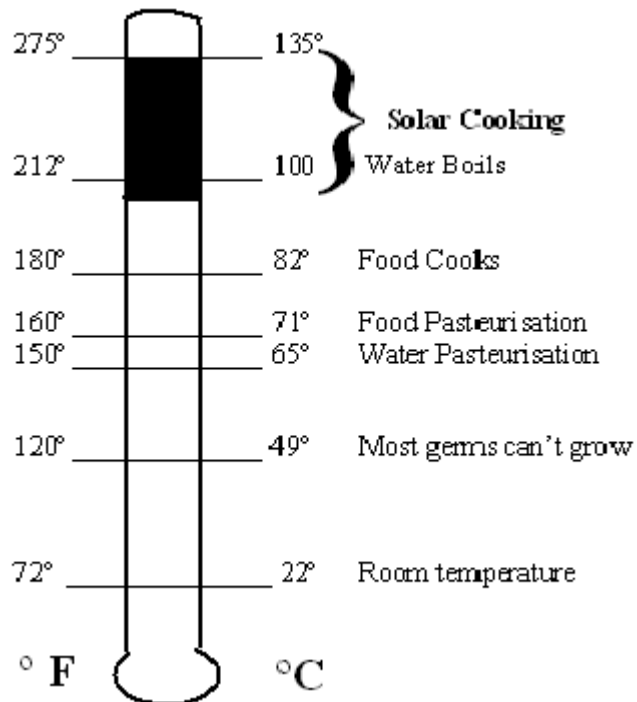


3.3. How to pasteurise water with the solar CookIt

If the water is perhaps contaminated it can be made safe to drink by heating it in a CookIt. A simple WAPI tells you for sure if it is safe.

<p>Put water in a black painted water kettle Put a small piece of paper into the spout to avoid that too much condensation escapes.</p>	
<p>Put WAPI in the water with wax up, washer down the end of the string down</p>	
<p>Put the lid on the water kettle and put it on the pot stand inside a heat-resistant plastic bag so that there is air under and around the kettle.</p>	
<p>Put the CookIt in the sun. Close the bag with a string, not too tight so that the air can escape.</p>	
<p>When the wax has melted and run down to the washer, the water is pasteurised and safe for drinking.</p>	
<p>Keep pasteurised water covered until used. Don't let fingers or unclean objects touch clean water. Don't pour the safe water into another vessel. Keep the water warm by putting the water kettle into the heat-retention basket.</p>	
<p>After each use, pull the WAPI string to the other end, so that the wax is again at the top and the washer at the bottom.</p>	

3.4. How hot does a CookIt get?



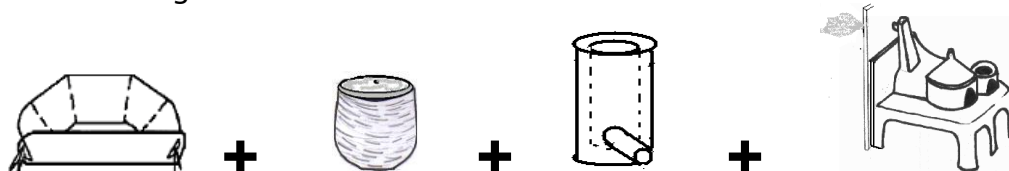
Note:

Food safety: Pasteurisation temperatures kill germs and parasites that cause illness if eaten.

Water safety : To be safe, water only needs to be heated to 150 degrees °F (65°C). To know if water has been heated enough either use a water pasteurisation indicator (WAPI) or otherwise observe it boiling at 212 °F (100°C).

4. NEW COOKING for 6 person household

New cooking means :



4.1. Bright sky, sun soon high in the sky

Food for breakfast

Use your solar cooked food of the day before Or cook your food on a FSS¹ Rocket stove

Food for lunch

Start 8.00 or 8.30 AM, cooking with CookIt;

If you leave your house very early, put the CookIt with food in a spot where the sun will shine, protect the CookIt by putting it on a low roof or put branches around it to stop goats from eating the cardboard.

After 1 ½ hours put pan with rice / baby food / vegetables / sauce in the Heat-retention basket;

¹ Fuel Saving Stove

At the same time start another pan with food or water in the water kettle in the CookIt;
 If needed bake injera on Awra Amba FSS.
 To make traditional coffee you need some charcoal for Lakech
 At noon your food will be ready

Food evening meal

During the day put food in the CookIt. After 4.00 PM the sun is less powerful
 Keep food warm or continue cooking process in Heat-retention hay basket
 If you want to eat and your food is not ready yet, cook it for a short time on the Rocket stove to finish your cooking.

4.2. Partly cloudy with long periods of sun

Food for breakfast

Eat solar cooked food of the day before
 Or cook your food on an FSS Rocket stove

Food for Lunch

Start 8.00 or 8.30 AM, cooking with CookIt; the cooking process takes more time.
 If food is not ready at 12.00 noon finish cooking on FSS Rocket stove
 If needed bake injera on Awra Amba FSS
 Put water in water kettle to make safe (drinking) water for you and your baby

Food for evening meal

Put pan with food in the CookIt; cooking process takes more time
 If food is not ready finish cooking on FSS Rocket stove

4.3. Mainly cloudy with very short periods of sun

Food for breakfast

As described above

Food for lunch

Prepare food on Rocket stove and put pan with food in Heat retention basket to continue cooking process.
 If needed bake injera on Awra Amba FSS
 Watch the sky if there are longer sunny periods; if so, change to the CookIt and basket to cook the food.

Food for evening meal

Cook your food in the Rocket stove and use the basket as much as possible.

4.4. Rainy days / rainy season

Food for breakfast

Prepare food on Rocket stove

Food for lunch

Prepare food on Rocket stove; shorten cooking time and reduce firewood by using Heat-retention basket.
 Pasteurise water on Rocket stove; keep water warm in Heat-retention basket; always observe the sky if the sun is shining; if so put the pan or kettle in the CookIt.

Food for evening meal

Prepare food on Rocket stove and Awra Amba FSS and reduce firewood by using Basket.

SAVING WOOD / FIRE WOOD

Cooking with power of the sun → **saving firewood**
 Saving firewood → **saving money**
 Saving time by less collecting → **earning money**

COST PRICES in Birrs

Heat-Retention Hay Basket	Birr ..
Solar Cookit + pan / WAPI	Birr
FSS Rocket stove	Birr
Awra Amba FSS	Birr

Total	Birr ± 400
Solar Box	Birr ...
Solar food dryer	Birr ...

FIREWOOD CONSUMPTION - COSTS - SAVINGS

EXAMPLE Household of 6 persons	YOU
<u>Example Firewood consumption</u>	<u>My firewood consumption</u>
One day = 6 kg wood	One day = ...kg wood
One week 7 x 6 kg = 42 kg wood	One week ... x ...kg = ...kg wood
One year 52 weeks x 42 kg = 2080 kg wood	One year 52 weeks x ...kg = ...kg wood
<u>Example Firewood costs</u>	<u>My firewood costs</u>
1 kg firewood = 1 Birr	1 kg firewood =Birr
One day 6 p x 6 kg x 1 Birr = 6 Birr	One day 6 p x .. kg x .. Birr = Birr
One week 7 days x 6 kg = 42 Birr	One week 7 days x ... kg =Birr
One year 52 weeks x 42 Birr = 2184 Birr	One year 52 weeks x ... Birr = Birr
<u>Example Firewood saving in kg wood</u>	<u>My firewood saving</u>
ISSC cooking gives 70% savings	I have ISSC package, thus saving 70% wood
70% per day saving 4 kg wood	70% per day saving kg wood
70% per week saving 28kg wood	70% per week saving kg wood
70% per year saving 1456kg wood	70% per year saving kg wood
= saving approx 7 trees	= I save approx ...trees
<u>Example Firewood saving in Birrs</u>	<u>My firewood saving in Birrs</u>
1kg wood = 1 Birr	
One day 4 kg x 1 Birr saving 4 Birr	In one day .. kg x .. Birr I save ... Birr
One week 7 x 4 Birr saving 28 Birr	In one week 7 x .. Birr I save ... Birr
One year 52 x 28 Birr saving 1456 Birr	In one year 52 x .. Birr I save Birr
A complete ISSC package costs appr 400Birr	A complete ISSC package costs appr 400Birr