

Rocket Stove workshop

Rocket stoves are efficient cooking devices that use draft and an insulated chimney to cook/and or heat water with very little wood. They can be made from many different materials, recycled tins, metal, bricks. In rural Zimbabwe very few people can afford to spend money using locally available materials such as clay is key to long-term success.

They use only small sticks to cook or heat water and produce very little smoke. As in rural areas cooking is often done inside on open fires, smoke related diseases are a big risk.



These clay rocket stoves are made using locally available clay, the same clay that is used for building traditional homes works well. This combined with manure either from donkey, goat or cow, are the two key ingredients. The fibres in the manure burn out leaving pockets of air, which insulate the chimney, making the stove very efficient.

Materials needed:

- 1 bucket of sieved animal manure
- 3 buckets of clay/clay soil, sieved
- Half a bucket of dry wood ash
- 2 cups of sugar
- 2 buckets of water
- 1 plastic bucket for cutting to make the mould
- 1x 35 cm length of PVC pipe (Drainage pipe 11cm diameter)
- 7 x20cm lengths of round bar/ rebar
- A small piece of tin (a flattened can works)
- A Tarpaulin or strong plastic sheet to mix materials



(1 bucket=20 litres)

Step 1

Soak half a bucket of ash in 20 litres of water over night.

Dissolve 2 cups of sugar in 2 litres of water (both help to strengthen the stove and stop it cracking)

Step 2

On a tarpaulin/plastic sheet place the 3 buckets of sieved clay with 1 bucket of sieved manure. Mix with hands and/or feet until well combined.



Soaking ash for a workshop in a 200l drum



Mixing the dry sieved manure and the dry sieved clay

Sieved manure



Step 3



Pour the ash water and sugar water into a depression in the centre of the mixed clay and manure. Mix with feet and until very well combined, use more water if needed. The mix should be stiff and not too wet.



Step 4

Make the mould for the top part of the stove using a 20litre bucket, cut off the bottom of the bucket so that a 30cm long piece is left. Cut a piece of drainage pipe that is longer than the bucket 35cm. Punch two small holes in the top of the pipe and secure a piece of wire, this will help to remove the pipe later.



Step 5

Cover the pipe and bucket with cooking oil to stop the clay from sticking. Place the PVC pipe in the centre and start packing the mixture into the mould making sure the pipe stays in the centre.



Leave this overnight to set

before removing the mould and the pipe.

Use your fist all the way around to measure that the pipe stays in a central position



Step 6

Now to make the mould for the base of the stove, use planks. Pallets are a good source of cheap reusable timber. The internal measurements of the rectangle are 40cm long by 30cm wide by 15cms deep.



Fill with the mix, packing tightly with your fist.

Leave over-night to start to set before removing the mould.



Step 7

The stove can be adapted to fit different sized pots. Making a pot skirt for your most



used pot means that heat isn't lost and cooking is quicker. Here a plastic dish is used where the mix is packed around the edges of the dish, leaving a 1cm gap all the way around the pot. Leave this in the mould until it has dried completely as it is too fragile to move whilst wet.

Step 8

The next day remove the moulds for the top part of the stove and the base (leave the pot skirt to dry in the dish). Remove the bucket before pulling the pipe out, so as not to damage the chimney.



Step 9



For the base:

In the centre of the block, using a knife cut the shape of the ash drop and grill area. This should be 30cms long by 15cms wide, by 7cms deep. Scoop out the mix from this shape.

Insert the 7 20cm long pieces of rebar into the gap by pushing down and filling and smoothing around each piece. This is the bottom part of the stove complete. Place 4 pieces of rebar close together at the end where the sticks will burn. This will stop the stove from choking allowing the coals to turn to ash before falling through the grill.

Step 10

Shape the top part of the stove, the pot stand, three raised triangular shaped pieces. Make sure they are flat as this is where the pot will rest while cooking. A knife is a good tool to do this. Leave a gap around the edge where the pot skirt will sit.



Make sure the rim is wide enough for different sized pots



Cut an arched opening where the sticks will be inserted into the stove. This should be approx 5cm at the highest point (The chimney should be 20cms high from the top of the opening so don't make the doorway too high)

Step 11

Decorate! Make it your own, or make a trade mark design for selling. Natural paints (like the coloured soils traditionally used on earthen homes) can be used or make a relief pattern. Leave the whole stove in the shade until it is completely dry, this will lessen the chance of cracking. It needs to dry slowly so cover and keep indoors to dry. This will take around 3 weeks. The stove will need to be



used a few times before it is the most efficient. This is because the manure needs to burn out to leave pockets of air in the clay, this insulates the chimney and makes it very hot. The more it is used the better it is, once it starts there is very little smoke. Only a few small sticks are needed, and the stove retains heat.



Rocket stoves saving our trees

Using less firewood to cook means less work and time spent collecting firewood. It also means that we are protecting our forests. Trees are important for all of us, if we cut all the trees the land will become like a desert and we won't be able to live from the land.

It is not only the fruiting trees that are important to protect, but all trees. Trees protect our water sources, they stop erosion of soil, provide oxygen, cover and fertilise soil, cool the earth, provide wind protection, take carbon out of the atmosphere which we need to stop climate change. We can plant and/or protect an



area of trees in our own homesteads or villages that will supply enough firewood from the sticks to use in the rocket stoves throughout the year!

A solar cooker



If we create systems for ourselves that improve our lives, make more time for ourselves and protect or even improve our environment, we are all winning. Think about using your stove as part of a system. Solar cookers use only sunlight, these work only on clear sunny days, but in these

conditions boil water and cook very fast. Another element to the system can be using retained heat, the original slow cookers, no electricity, just making an insulated parcel around your pot. Anything can be used, old clothes, blankets, cushions, straw, think of using recycled materials. Start cooking your food on a rocket stove or solar cooker. Wait until it boils beans/rice/stew anything can be cooked this way, then place it inside the insulated 'hot box' and cover. Depending on what you are cooking leave it for a few hours. The food will keep cooking slowly, no worries of burning, no need to tend to a fire!

A 'hot box' made from what was lying around



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