IMPACT LABS NIGERIA

CHARCOAL BRIQUETTING

WHAT, WHY, HOW

STATISTICS

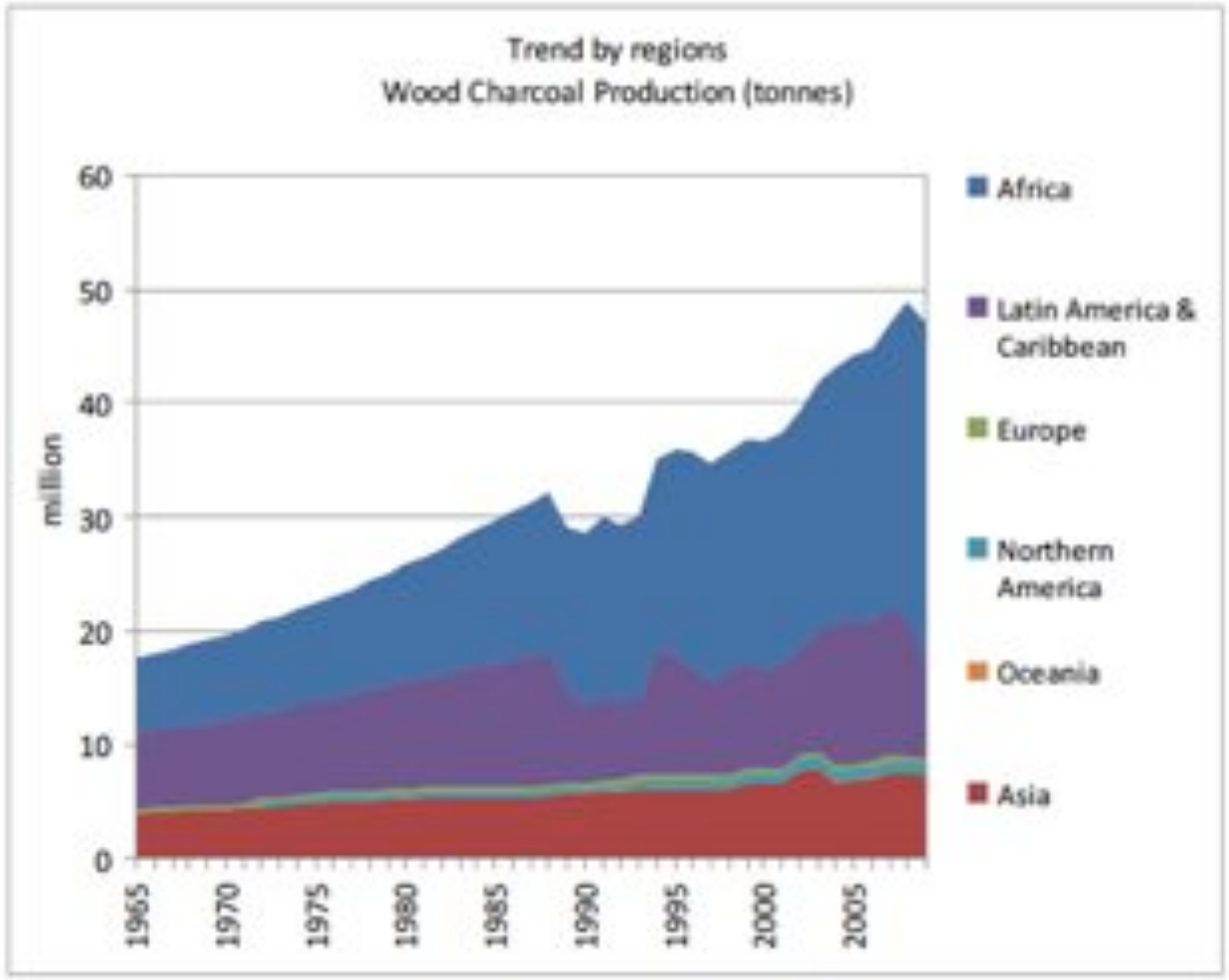
2 billion – number of people who uses wood, charcoal and agricultural waste for their energy needs

1.6 million – number of deaths caused by respiratory infections from breathing in cooking fires in year 2000. This is equivalent to 2.7% of the global burden of disease

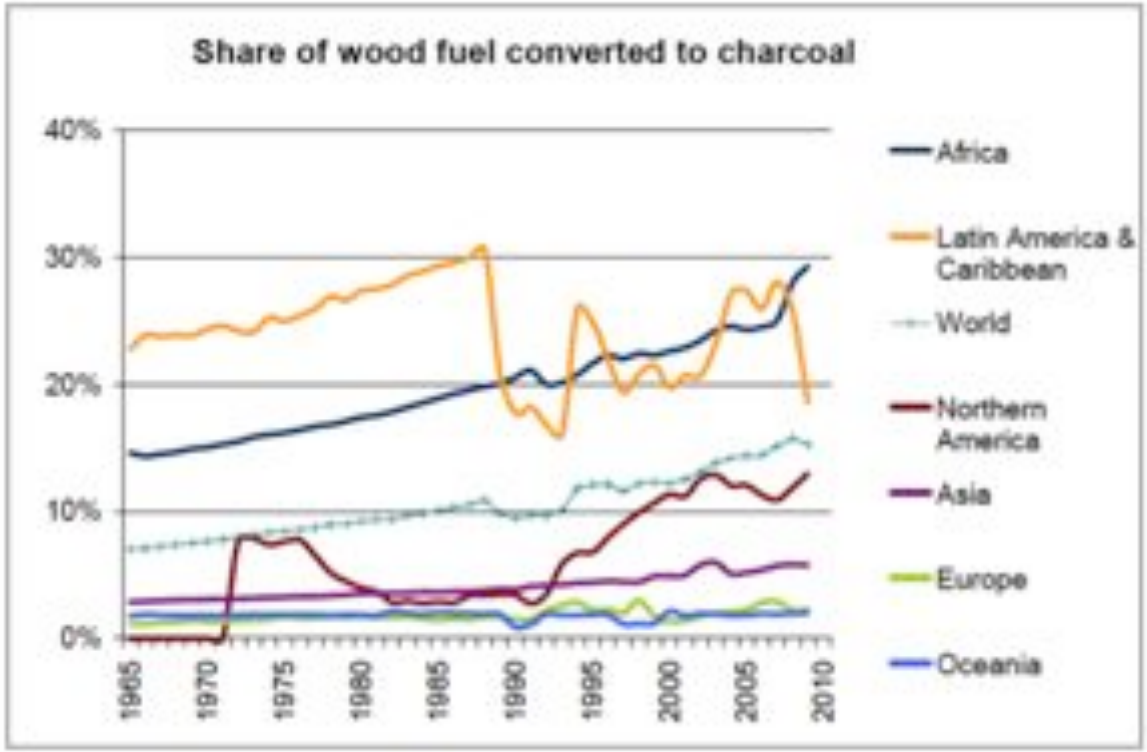
50 billion – estimated number of hours spent collecting wood for energy worldwide

25% - percentage of income poorer families spend on fuel

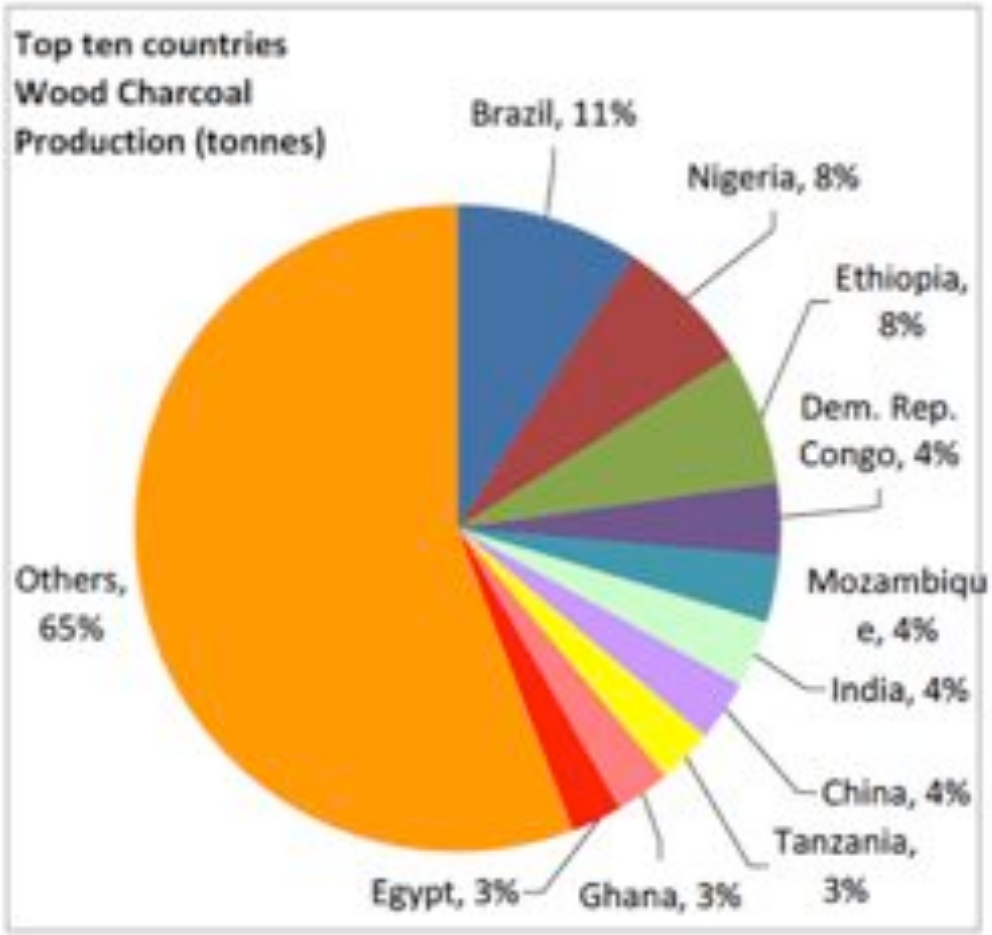
SOME MORE STATISTICS...



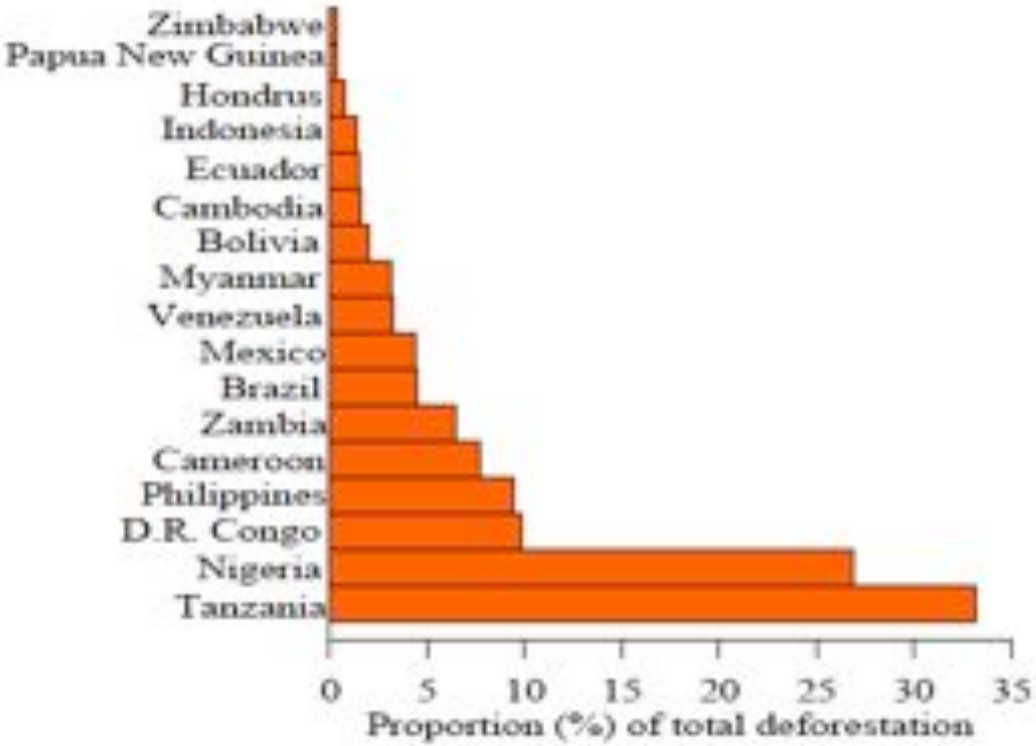
AND MORE...


Share of wood fuel converted to charcoal
40%
30%
20%
10%
0%
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Africa
Latin America & Caribbean
World
Northern America
Asia
Europe
Oceania

AND MORE…

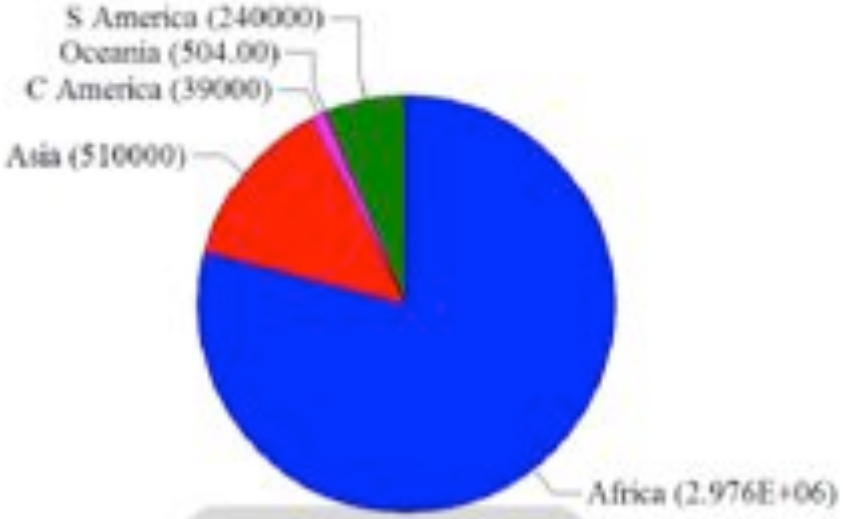

Top ten countries
Wood Charcoal
Production (tonnes)
Brazil, 11%
Nigeria, 8%
Ethiopia, 8%
Dem. Rep. Congo, 4%
Mozambique, 4%
India, 4%
China, 4%
Tanzania, 3%
Ghana, 3%
Egypt, 3%
Others, 65%

AND EVEN MORE...



CONTRIBUTION OF CHARCOAL PRODUCTION TO TOTAL DEFORESTATION

AND MORE...



ESTIMATED DEFORESTATION CAUSED BY CHARCOAL PRODUCTION

ALTERNATIVES TO CHARCOAL

Solar cookers	Usually slower than traditional stoves and may work only during limited hours of the day
Fuel-efficient stoves	Reduce, but not eliminate, the consumption of wood-based or fossil-fuel
Briquettes from waste paper	Difficult to use and still produce a significant amount of smoke

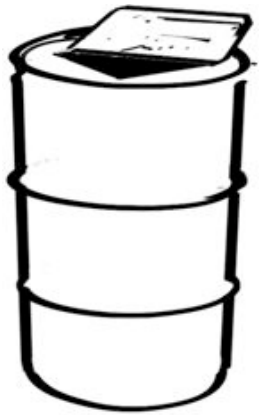
“FUEL FROM THE FIELDS” CHARCOAL BRIQUETTES

ELEMENTS FOR MAKING CHARCOAL

The main step in making Fuel from the Fields charcoal is carbonization, which requires three things: dry organic material (also called biomass), heat, and control of the amount of oxygen. The biomass may be any of a variety of agricultural waste materials including: corncobs, sugarcane waste (bagasse), millet stalks, groundnut shells, palm leaves or bamboo. It must be very dry in order to burn properly. The heat is generated by setting the biomass on fire, and the oxygen-free environment is created by sealing the drum with sand or soil. The carbonized material is then crushed, mixed with a binder, and made into briquettes.

Biomass

Heat



Oxygen Control

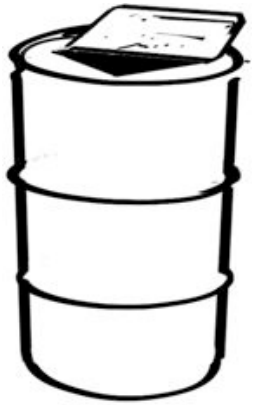
STEP 1 – PREPARING THE KILN

A 55 gallon oil drum can be used as a kiln to make charcoal.

Burn awav oil residue from the drum before making the first batch of charcoal !!!

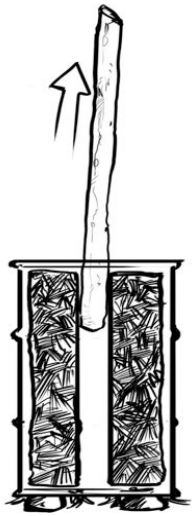
Cut a large opening for filling the kiln with the material you want to carbonize.

Cut several holes in the bottom of the drum. These holes allow air to flow through the drum while burning, which results in a hotter fire and produces better charcoal.



A piece of sheet metal is needed to cover the top hole and prevent oxygen from entering the drum, allowing the material inside to carbonize.

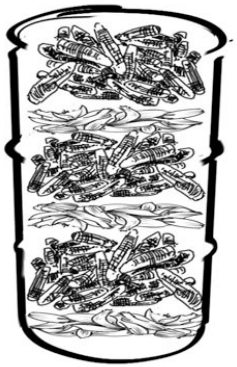
STEP 2 – FILLING THE DRUM



Tip the drum on its side, and stuff the air vents on the bottom with a material that ignites easily.

This will make it easy to light the drum from the bottom.

Put a large stick in the center of the drum. This will create an airway shaft to make the fire burn better.



Corn Cobs: Alternate thin (5cm) layers of corn husks with thicker (25cm) layers corn cobs until the drum is full.

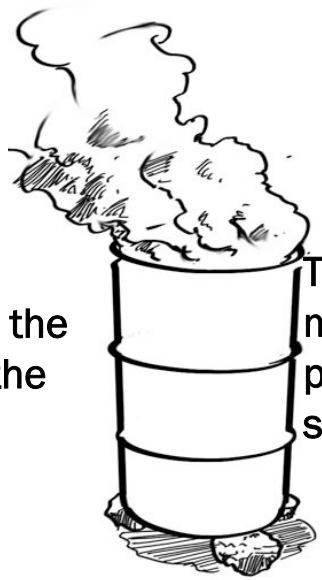
Bagasse: Fill the drum with bagasse.

STEP 3 - LIGHTING THE FIRE

Before starting the burn, place the drum on top of three stones, so that air can flow through the holes in the bottom.

Remove the stick in the center for ventilation.

Light the material at the bottom of the barrel.



The burning material will produce a lot of smoke...

After 5-10 minutes, the smoke will be hot enough that you can ignite it to make the fire burn more cleanly.

STEP 4 - SEALING THE DRUM

After another 5-10 minutes, cover the drum with the metal lid.

Carefully remove the stones from under the drum while supporting the drum with a stick.

Seal the bottom edges and the top of the drum with sand or dirt to prevent oxygen from entering. Wait at least 2 hours before opening.

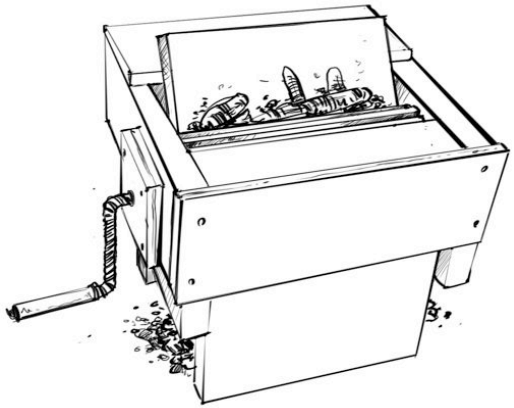
STEP 5 - CRUSHING THE CHARCOAL

There are many ways to crush charcoal. Adding water while crushing helps to prevent dust from spreading around.

You can crush charcoal in a bag with a stick,

or with a mortar and pestle using a cover to prevent dust from flaring up,

or on a tarp using stones.



A charcoal crushing machine can be used for large quantities.

STEP 6 - MAKING THE BINDER

Grate one cassava.

Mix with boiling water until thick and sticky.

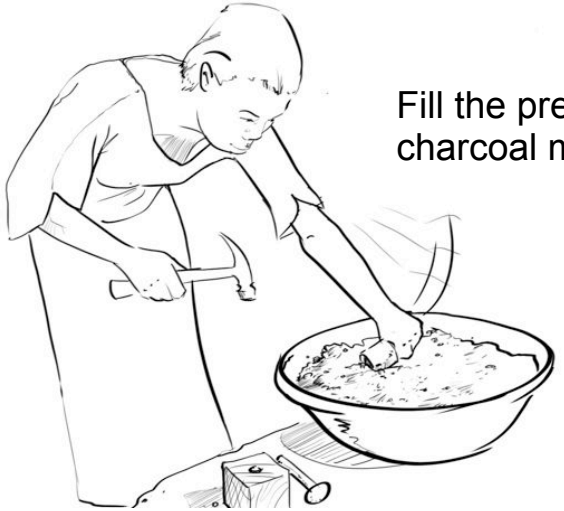
1 Cassava

1.5 L of boiling water

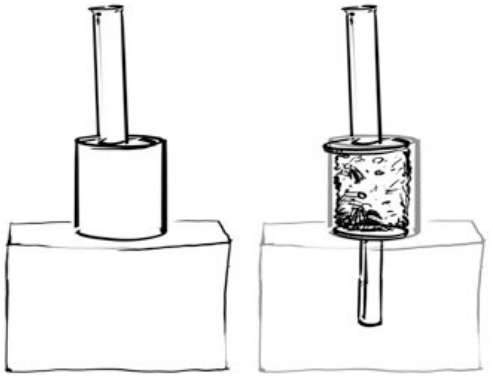
1 Drum of crushed carbonized material

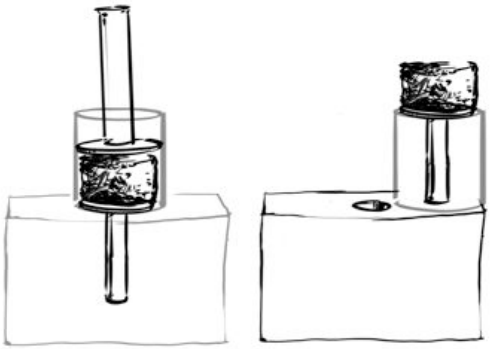
Combine charcoal and binder mixture.

STEP 7 - MAKING BRIQUETTES



Fill the press with charcoal mixture.



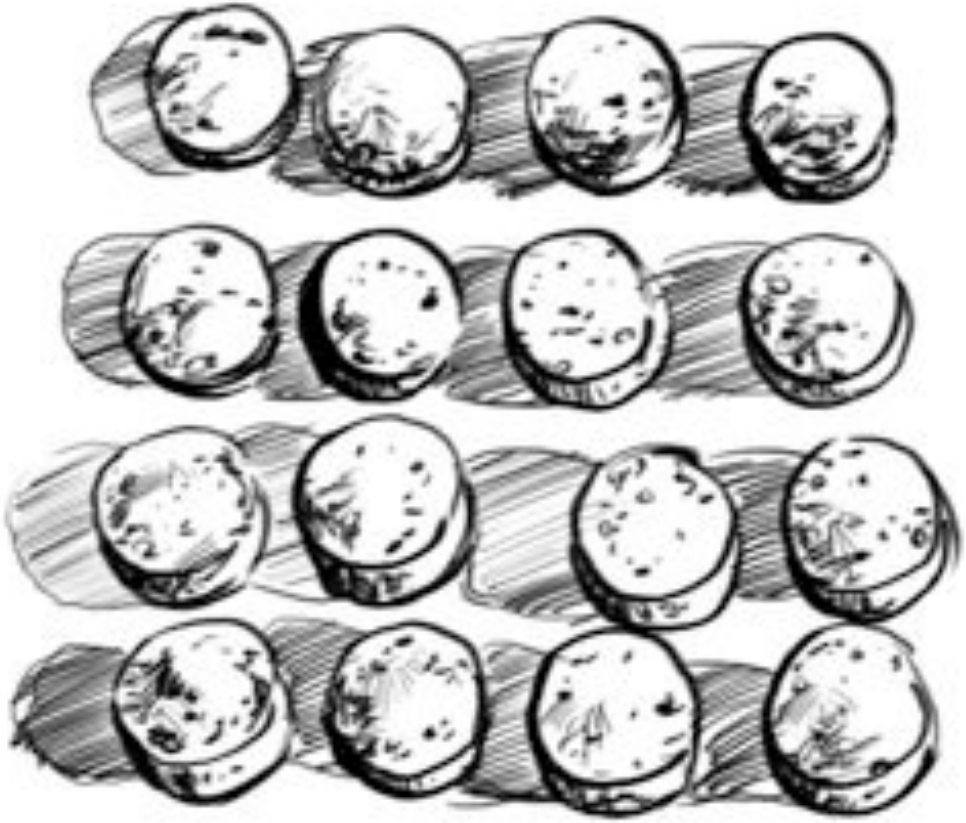


Hit plunger to form the briquette.

Push up the ejector to remove the briquette.

STEP 8 - DRYING BRIQUETTES

Fill the press with charcoal mixture.



VIDEO – MAKING CHARCOAL BRIQUETTES

https://www.youtube.com/watch?v=LqI63IEg3MM