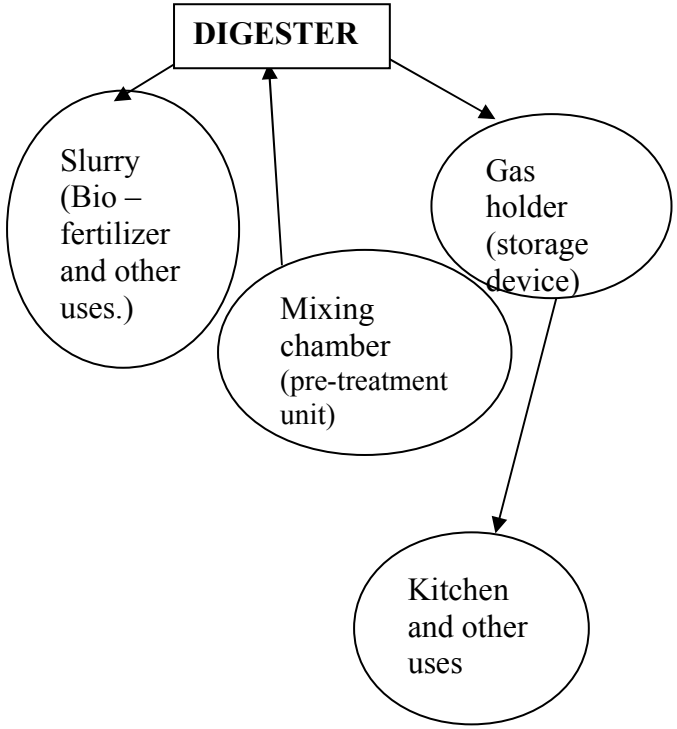
Diagram of a Biogas production unit.



For more information Contact:
Head Office: Mile 6 Nkwen
BP 5047, Nkwen Bamenda.
Email: shumas_ngo@yahoo.com
Tel: 237- 777 55 630
Website: www.shumas-cameroon.org.
Or Regional Office: Kumbo and SHUMAS BIOFARM Center Kumbo.

Way forward:
SHUMAS plans to extend her technology to participants in her training and demonstration BIOfarm centre in Kumbo, individuals, groups, families, schools etc willing to use this new clean renewable energy source. Vulgarisation of the technology.

Pre-treatment unit. (mixing chamber) with an inlet pipe.

Underground digester with a floating gas holder above.

An effective functional Biogas kitchen in the SHUMAS BIOFARM Centre- Kumbo.

STRATEGIC HUMANITARIAN SERVICES (SHUMAS) Cameroon
Registration Number:
N°. 1082/E.29/1111/Vol.7/APPB of 21st April 1997 in conformity with Law of Association N°. 90/53 of 19/12/90 regulating the formation and functioning of Associations in Cameroon.

BIOGAS CONSTRUCTION AND UTILIZATION

What is Biogas: It is a form of renewable energy called organic energy produced from the decomposition and fermentation of organic matters.

Why Biogas Production:

- It is a reliable, affordable, efficient and cheap source of organic energy with local materials.
- Good for rural poor peasant populations where purchase and availability of other refined industrialized cooking gas is scarce.
- Produces cooking gas for effective

cooking.

- Availability of organic materials.
- Biogas is solving the changes and variability in climate as a result of man's daily activity.

When to build and use a Biogas plant:

- Any time, provided:
- You have some animals (pigs, cows and chickens) in your yard.
- Do it when you have gathered enough materials for construction.

Problems of a small Biogas unit:

- Poor materials.
- Require labour for mixing the animal droppings.
- Poor welding skills for the gas holder.
- Accuracy.
- Monitoring and maintenance means.
- Scarcity of organic materials and cow dung.
- Poor maintenance.
- Ignorance of its existence

What we can do:

- Construct, install and maintain different types of Biogas systems.
- Build capacity for people who are willing to own and use one.
- Repair / rehabilitate an old collapsing Biogas unit.

Biogas Parameters:

- Suitable digesting temperature: 30 – 35ºC.
- PH is neutral (between 6.5 and 7.5). With pH less than 6, methanisation reaction will not occur.
- Retention time: 40 – 100 days.
- **Biogas energy content**: 6kwh / m3 = 0.6 litres of diesel.
- **Biogas generation:** 0.3 – 0.5 m3 gas /m3 digester volume per day.
- 1 cow yields: 9 – 15kg dung /day (producing about 0.4m3 gas /day).
- **1 pig yields:** 2 – 3 kg dung /day (producing 0.15m3 gas/day).
- **Gas requirement for cooking:** 0.1 – 0.3 m3/ person; 1 lamp uses 0.1 – 0.15m3 /hr; For engines: 0.6m3 /kwh.

Sample Design:

Using dung from 3 – 5 head of cattle or 8 – 12 pigs, a simple 8 – 10m3 biogas plant can produce 1.5 – 2m3 of gas and 100litres of slurry (Bio fertilizer) / day. This gas can be used for 6 – 8 persons to cook 2 – 3 meals a day; 2 lamps for 3hrs, refrigerator all day or operate a 3kw generator for 1hour.

Different Biogas systems:

1. **Floating – drum plants:** With floating metal gas holder. It is simple to install and control.
2. **Fixed – dome plants:** With gas storage according to the displacement principle in physics. i.e; the quantity of organic matter refill will be equivalent to the quantity of air / gas displaced.

Uses of Biogas:

- Source of energy for the kitchen.
- Source of electrical and heat energy.
- The Methane from biogas can be used as a clean Bio fuel.
- Biogas as a positive impact on the environment to fight global warming.
- Slurry produced is used as farm input, organic insect pest control and is a favourable environment for the growth of zooplanktons and phytoplankton in fish ponds.
- The methane of biogas is a source of methanol, an organic solvent and a primary substance for the synthesis of formaldehyde, chloromethane etc. It can be used to store fruits.