

# **Biogas as a sustainable energy source for Namibia/SANUMARC case study**



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# Biogas

Biomethane known as biogas is a product of anaerobic digestion, which is a sequence of processes in which microorganisms break down the biomass in absence of oxygen.

Biomass can be in the following forms:

- Livestock, vegetable waste, and poultry dropping
- municipal solid waste
- sewage water
- industrial solid effluent and land fill etc.

# Four biogas digester build in Omdel informal settlement

Omdel is informal settlement in Henties Bay, where most of inhabitants are low income earning citizens. To help with energy supply, SANUMARC supervised construction of four digesters funded by Global Environmental fund and skill transfer was carried out to educate the local community on the importance of biogas digesters and their maintenance. A community member was send to Benin and was trained how to build domestic biodigester

## Digesters Characteristics

- Volume: 16 m<sup>3</sup>
- 5 to 10 kg kitchen waste daily and sewer from municipal septic tank
- Water intake :10 to 15 liters
- Cooking time: 4 to 5 hours (non-stop)



**Four biogas digester build in Omdel informal settlement**

## **Challenges**

- **Odor- poor gas treatment forced household to disconnect from some digesters.**
- **Lack of alternative substrate to co-digest with septic tank sewer**
- **Lack of ownership led to current dilapidating situation of the digesters**

# SANUMARC Bio-digester

For research purposes, a biogas digester was built at SANUMARC.

1. Volume = 100 liters water tank,
2. Volume = 200 liters fiber glass

Fittings

- Inlet for feeding
- Outlet for gray water and sludge
- Gas outlet

# SANUMARC Bio-digester



# Uses of Biodigester sludge



# Advantages of implementing Biogas in Namibia

- With the availability of biomass, biogas is a renewable source of energy with a constant supply to consumers
- Slurry and grey water from digester are high quality organic fertiliser
- The use of biogas, contribute significantly to the protection of environment
- Once build, bio-digester is a minimal maintenance system
- Biogas is less air pollutant compared to burning wood or using paraffin for cooking
- Effectiveness of livestock, municipal and industrial waste management
- The digester can be built with local sourced materials
- Improved sanitation within farming areas, townships and industries
- Excess gas produced can be bottled and sold for income generation, thus contribute to employment creation for locals
- Using methane as fuel before it escape in atmosphere, will significantly reduce global warming and slow down the pace of climate change