Biodigesters in the community

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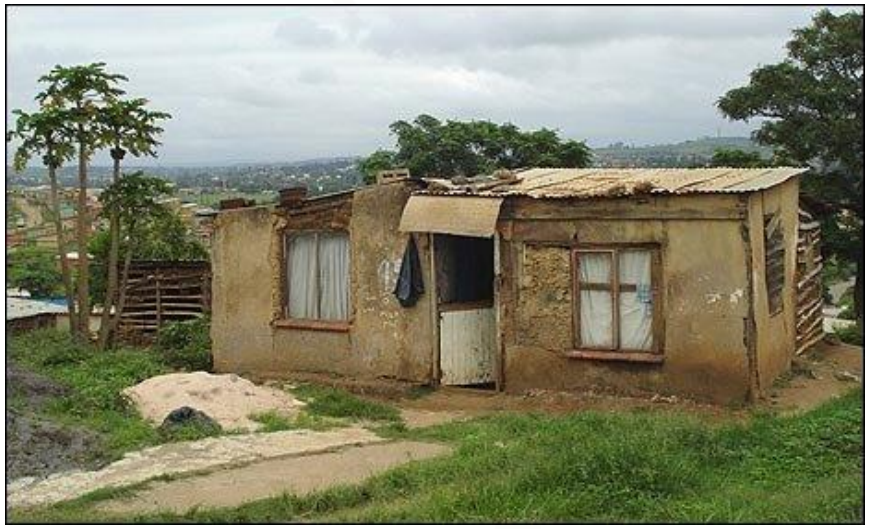
Introduction

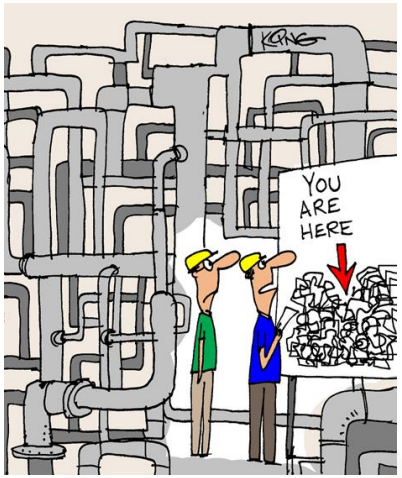
- Electricity is not available to all parts of SA.



- 20-30% of SA use traditional fuel
  - Firewood and charcoal
- Most of whom live in:
  - Urban slums
  - Rural areas

- Biogas has not been well accepted as other African countries

- To understand the major problems we put a team of:
  - Engineers
    - Design
    - Operation
  - Scientists
    - Bacterial activity
    - Feed
  - Social scientists
    - Human perception
    - Community liaison



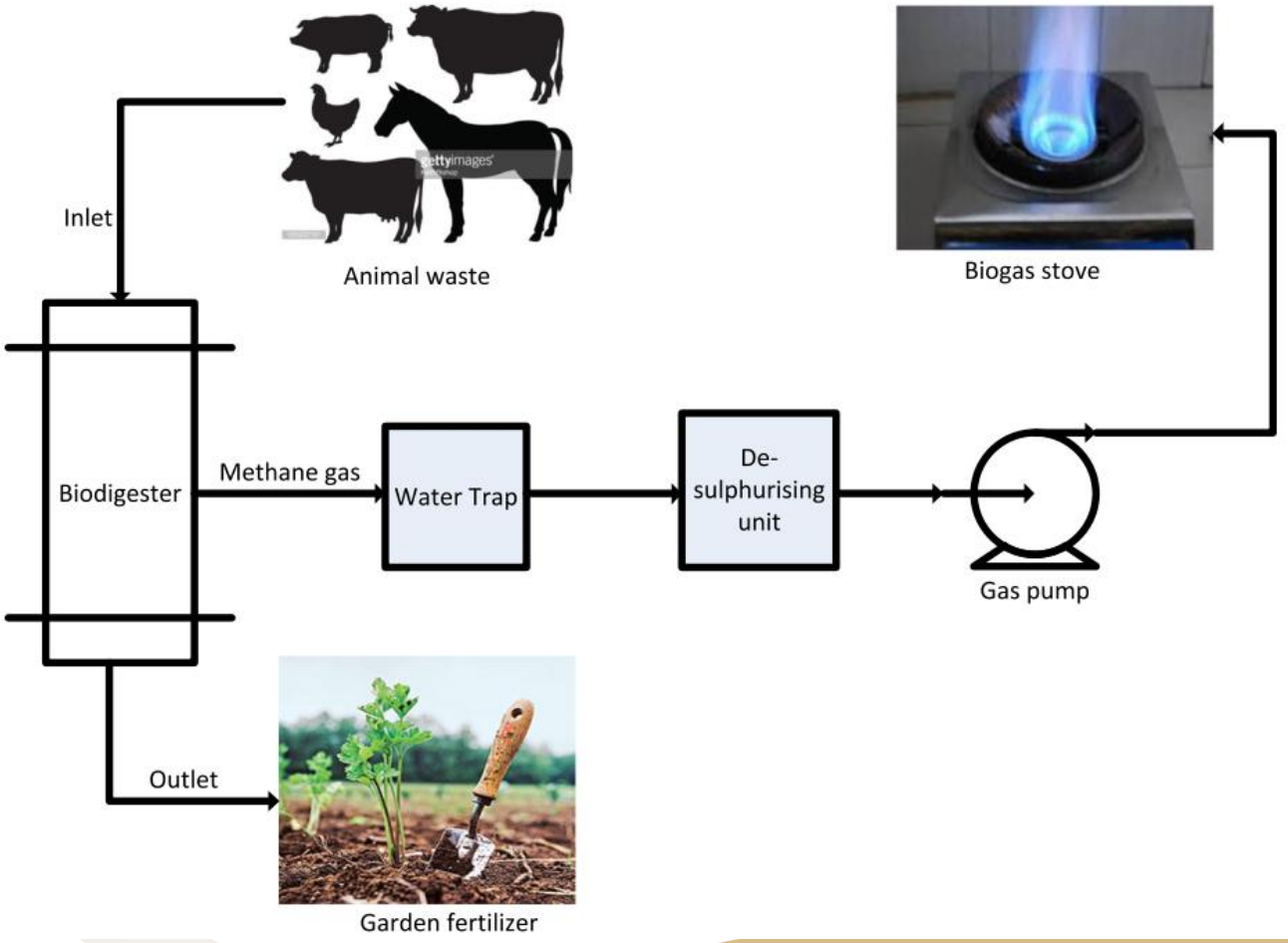
Methodology

- Case study- Implementing biogas technology in a farming community (Muldersdrift)
- Survey –
  - 46 school students
    - (The Science Festival Africa, “Sasol Expo”)
  - 25 people (before and After installation)
    - Muldersdrift
- Community was taken through a step by step explanation of the digester construction and operation.

Implementation of biodigester

- Biobag (Balloon) (durable reinforced PVC) $10m^3$
- 8metre long and 1 metre diameter
- Fed with fresh cow dung (1:4) – 20Litres every 2 days.
- Retention time of 20-40 days

Small-scale biodigester system



Results
Performance of the biodigester

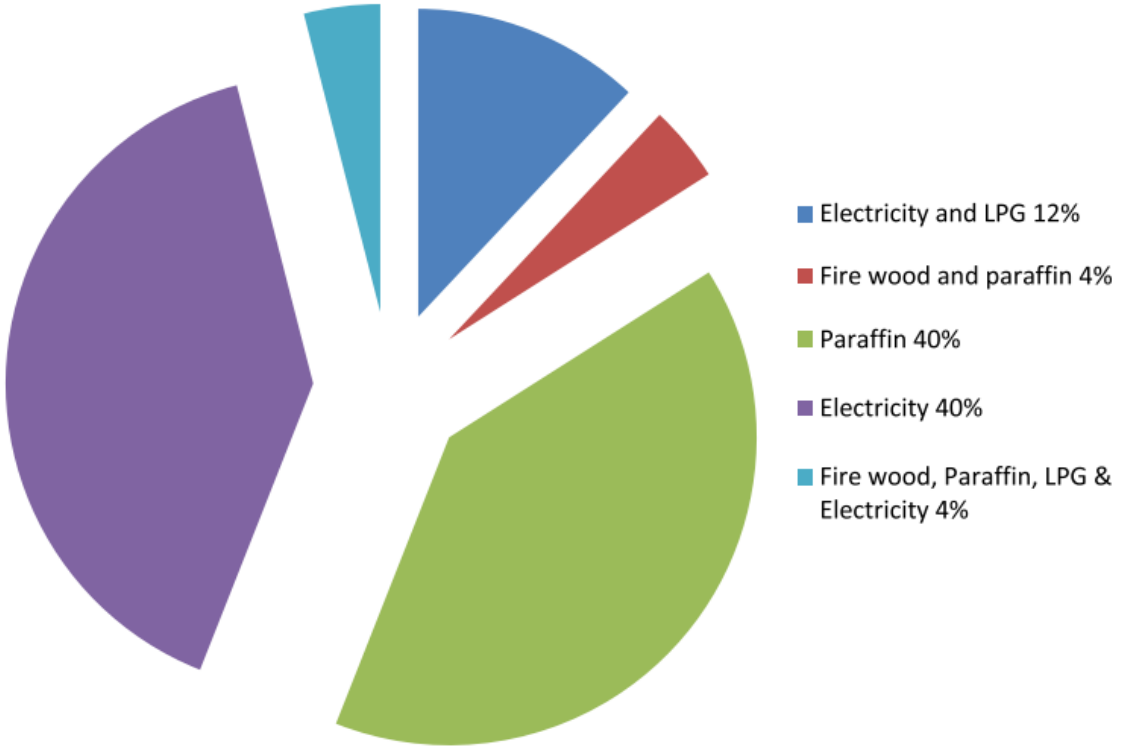
- Gas produced per day was about 4 – 5 m^3
- 53% methane 47% carbon dioxide
- In summer temperatures (25-30^oC)
  - Cooking - 3-4 hours/day.
  - Lighting – 3 hours/day
- In winter (~15^oC)
  - Cooking – 1-2 hours/day

Results
Survey

Sasol Science event	Students (46)	Source
No knowledge	85%	-
Knowledge on biogas	15%	TV and Reading
Muldersdrift	**Respondents (25)**	
No knowledge	64%	-
Knowledge on biogas	36%	TV and Reading

Energy source

- The current farm owner used firewood, electricity, paraffin and LPG
- After installation, 100% of cooking was using biogas
- 92% of respondents – welling to change to biogas for cooking



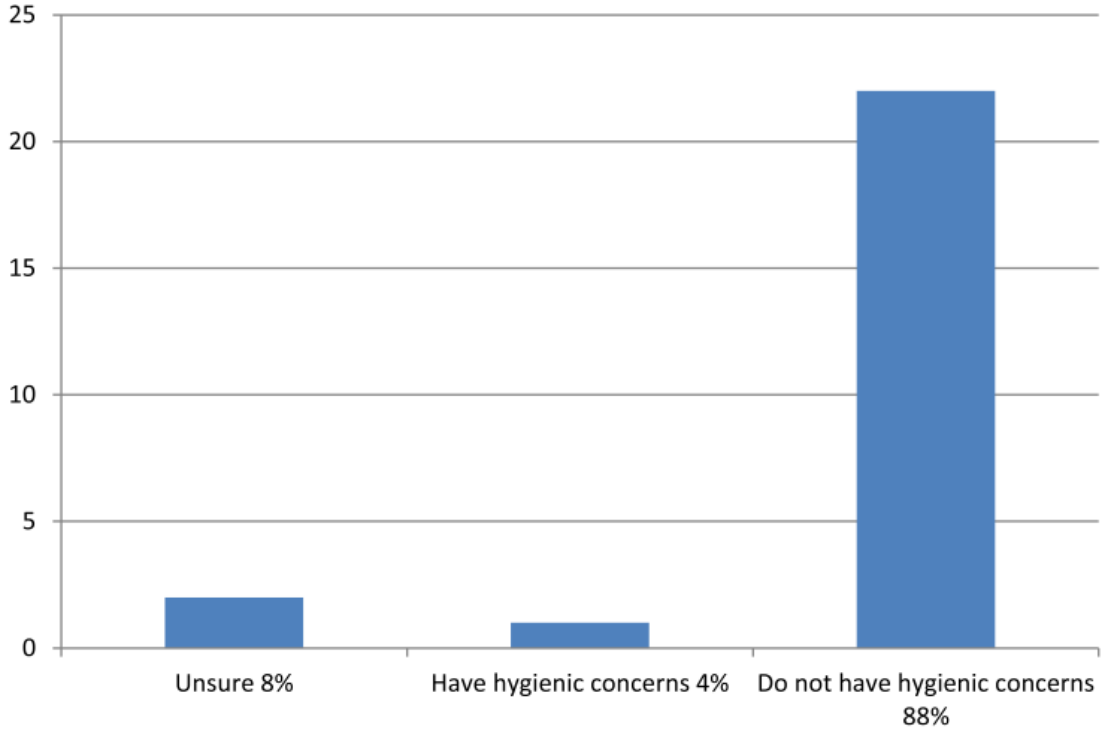
Hygiene concerns

Before installation

- Smelly
- Bacteria infested waste
- Exposed to danger
  (while preparing feed) or during cooking

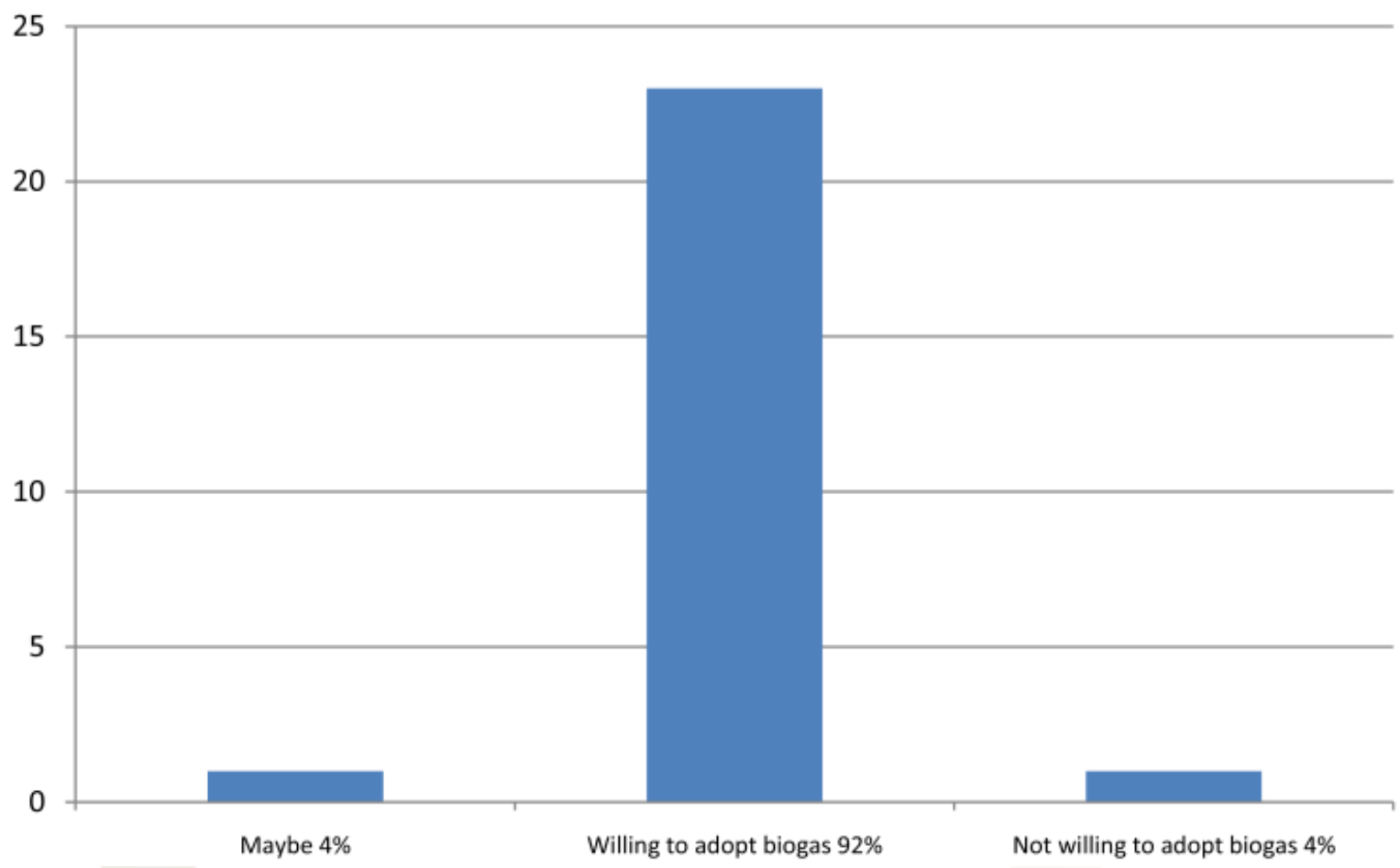
After Installation

- Most people accepted
  (no or limited risk)

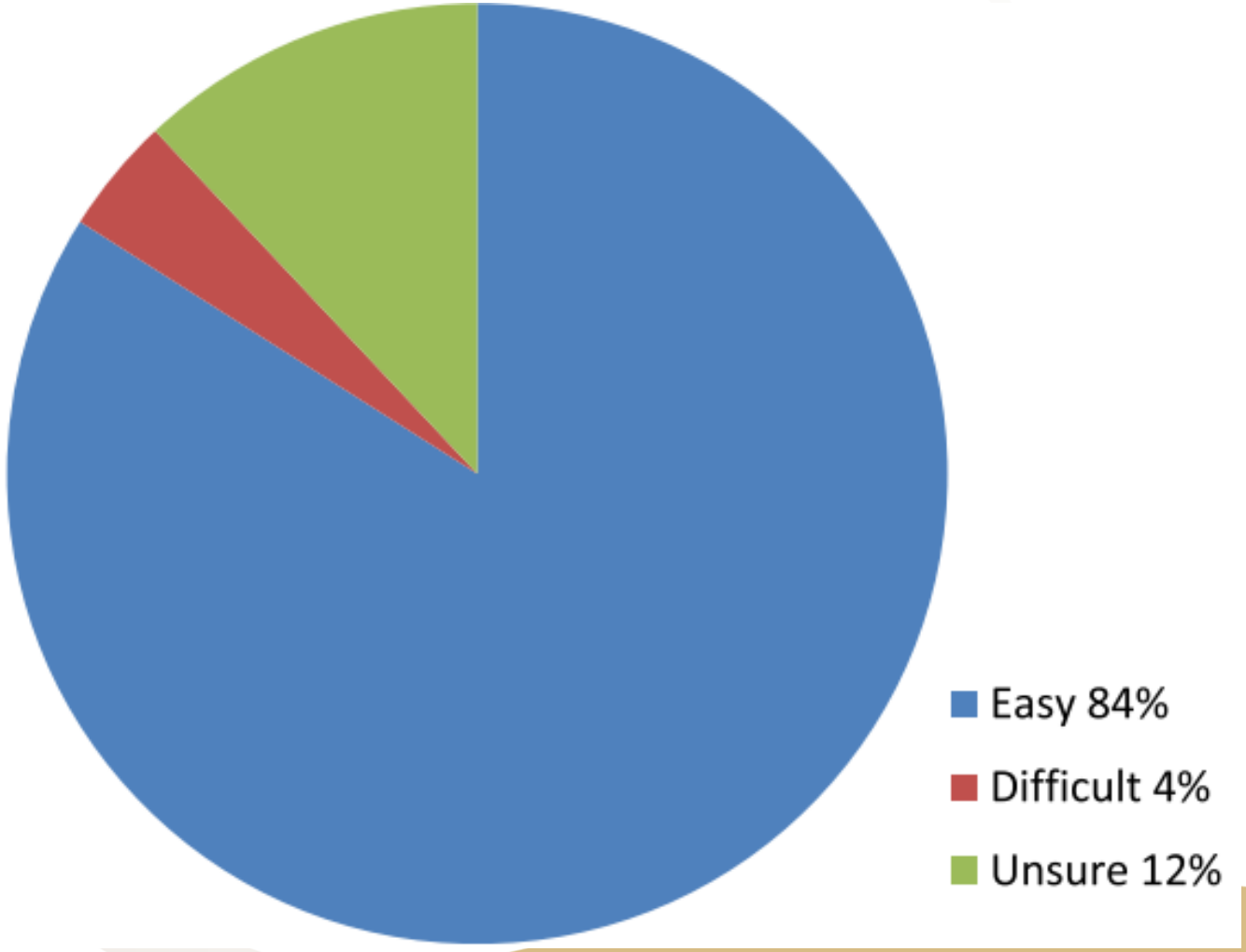


Post-implementation

Biogas Adoption

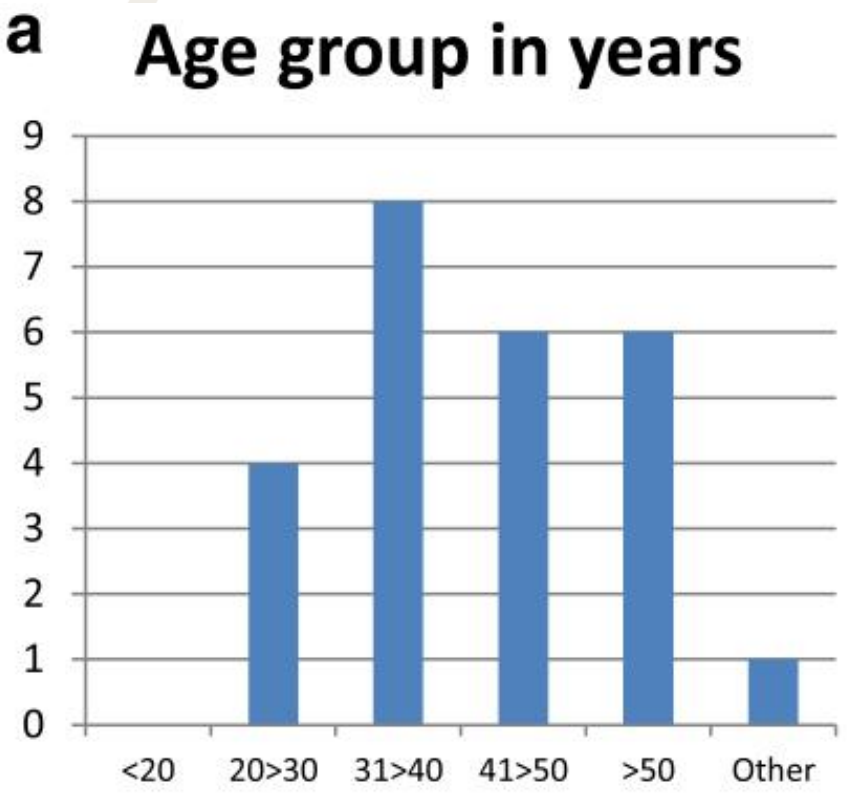


Biogas handling



Age group and profession

a



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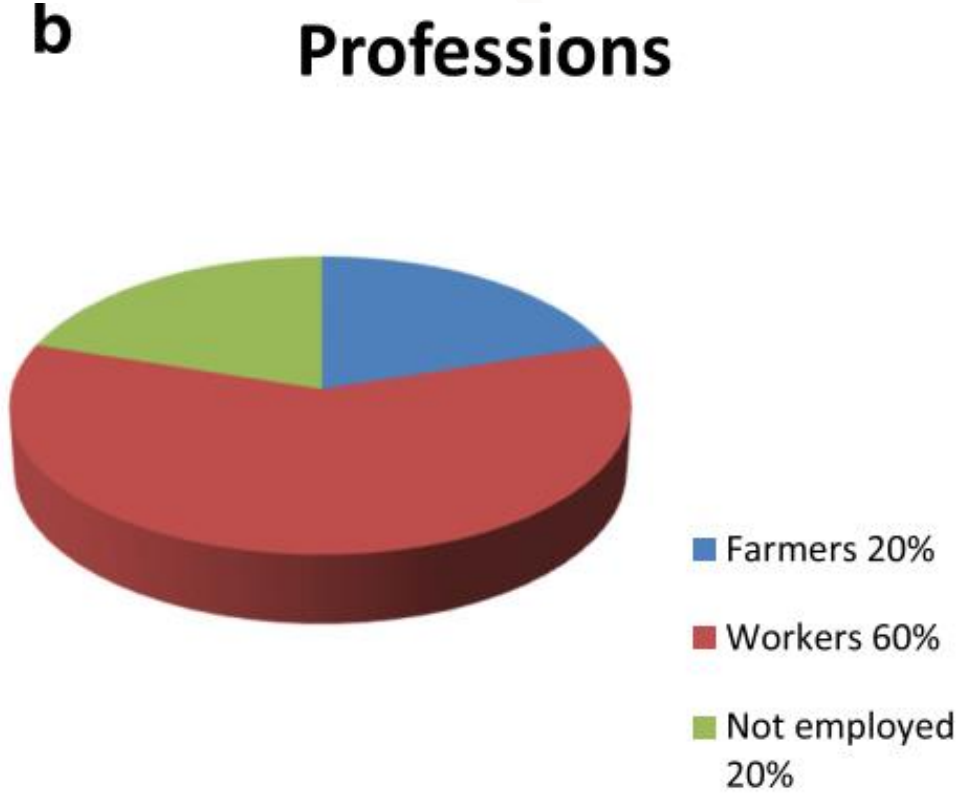

Cost benefit

- Two-plate stove used 2 hours a day for 30 days with energy consumption of about 2 kW.
- Saving of R2,220.91 / year

  (Mogale City - 2014/15 rates of R1.542/kWh)
- More savings can be incurred if geyser, lighting were included.

Conclusion

- Education and Exposure
- Cost was a problem
  - One indicated they were willing to pay 50% of capital cost
  - Others indicated 7.5% of capital cost.
- Availability of feed was an issue
- Interest by the community is important for the success of biogas.

Lanesia digester project

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Thank you