

Sustainable management of energy, water, food and fodder for small-holder farmers

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27 September 2013

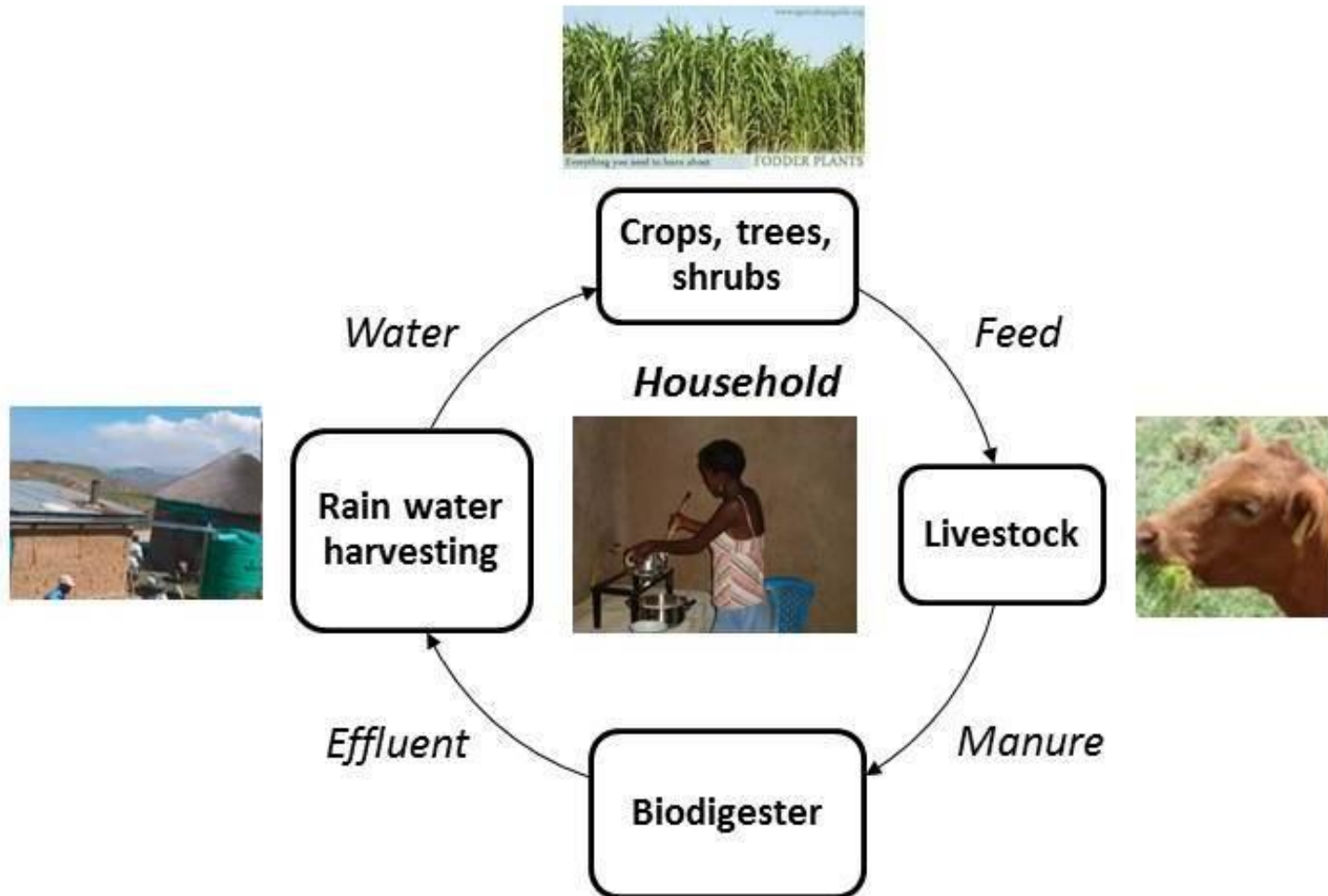


Pilot project to promote sustainable development



What are the key ingredients of sustainable dev?





Integrating RWH, livestock fodder production and biogas generation in rural areas of SA.

Three provinces in South Africa

- KZN, EC and Limpopo
- AIM - to establish demonstration models of sustainable rural livelihoods
- 2-4 pilot study households in each province

Community Surveys

- 135 HH in KZN and 200 in EC were interviewed
- Sample group represented 10% of study area

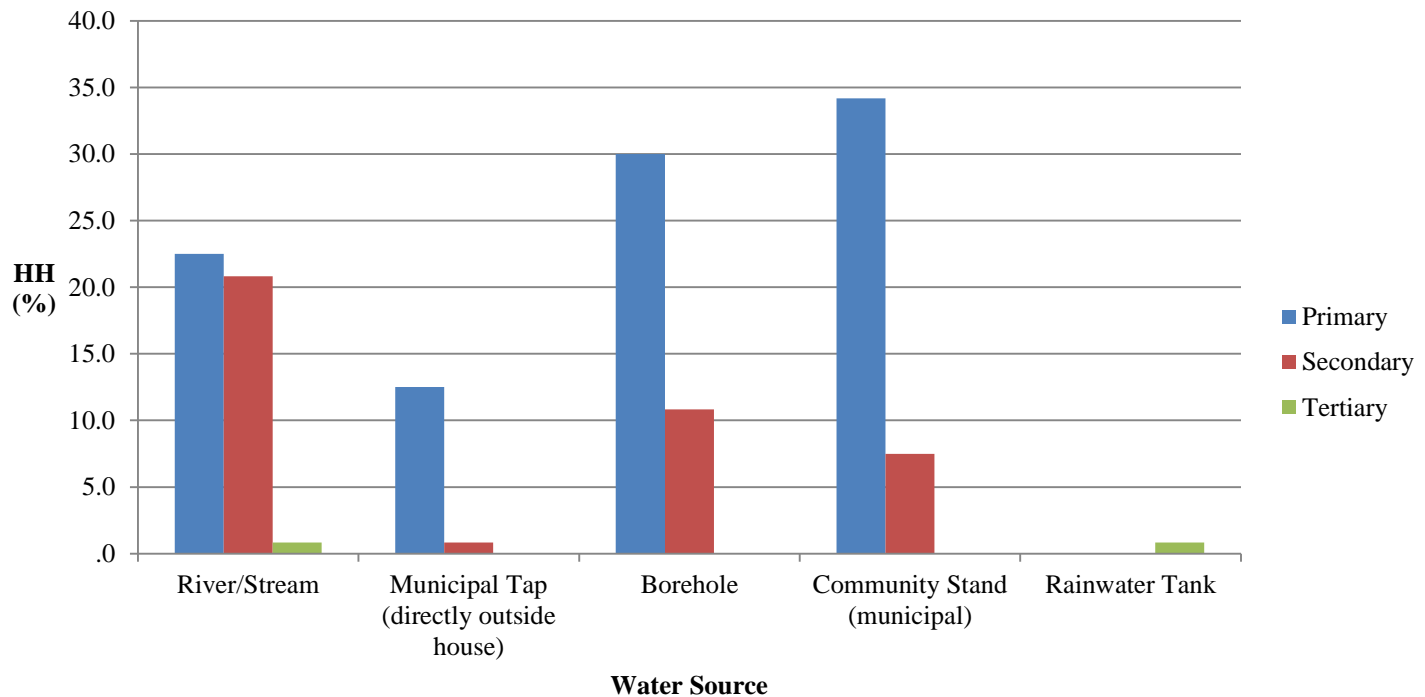


Water



Water usage and collection

- Source ranged from 2m to 1km away
- Average time spent collecting per day: 25mins
- Average quantity used: 62 l





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Another project sponsored by the Water Research Commission

Energy use

- Firewood used by 90% of households
- For cooking... primary energy:
 - Firewood (47.5%)
 - Paraffin (25.8%)
 - Electricity (21.7%)
 - Firewood Source
 - Collected (30%)
 - Bought (53%)
 - **Average cost: R750 pm**



Energy

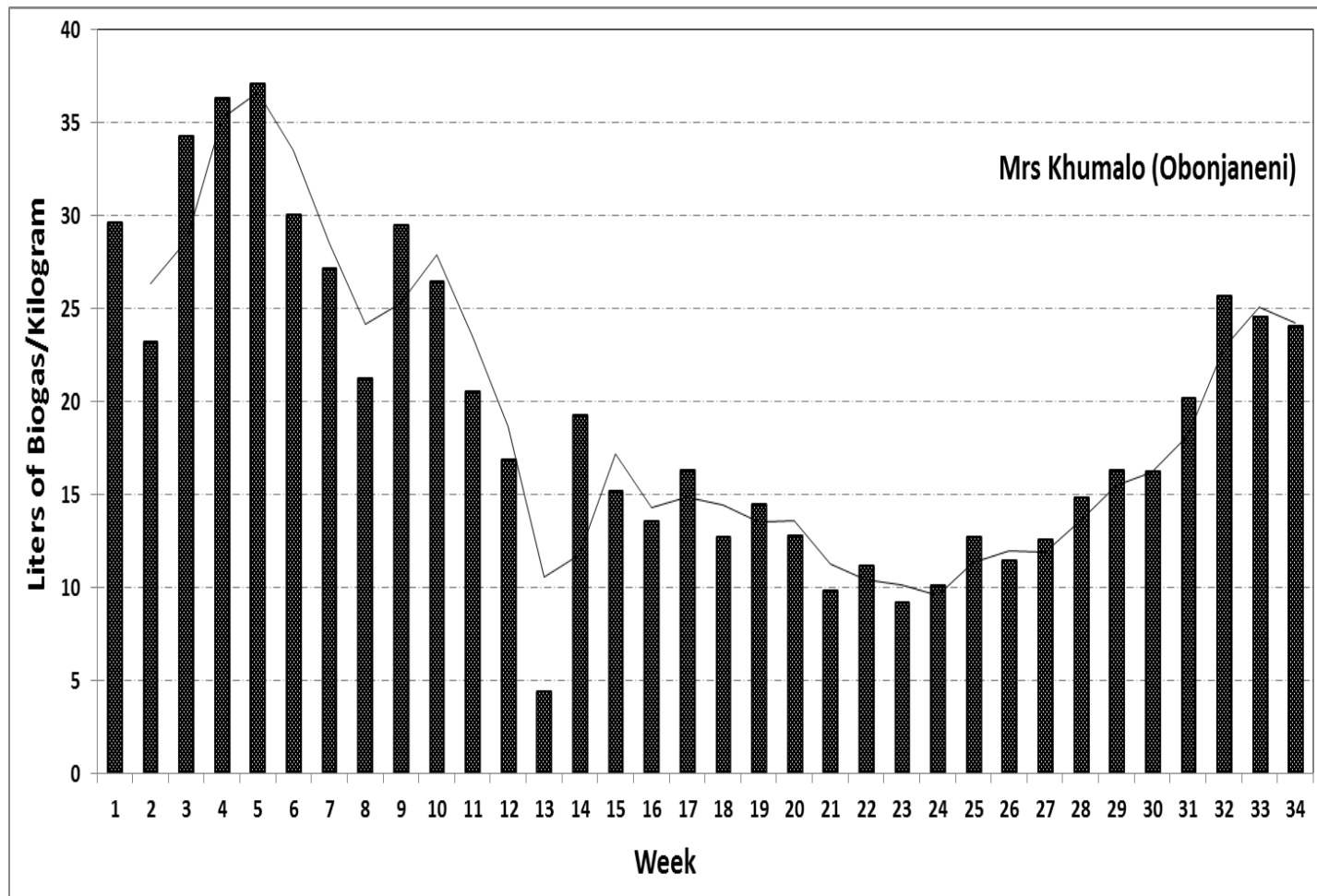
- **Biodigester: AGAMA BiogasPro6**
- **Households required to feed digester**
 - **20l water per day**
 - **20kg cow manure per day**
- **Provides aprx. 2 hours burn time per day**





Capacity building of HH
members to monitor impacts
of interventions





Biogas produced per kilogram by an Agama Pro Biogas digester

Benefits of biogas

- Reduced time spent collecting wood & tending fires
- Healthier indoor environment
- Reduced deforestation
- Reduced CO₂ emissions



Fodder Production using bioslurry



Winter fodder – supplementary feeding







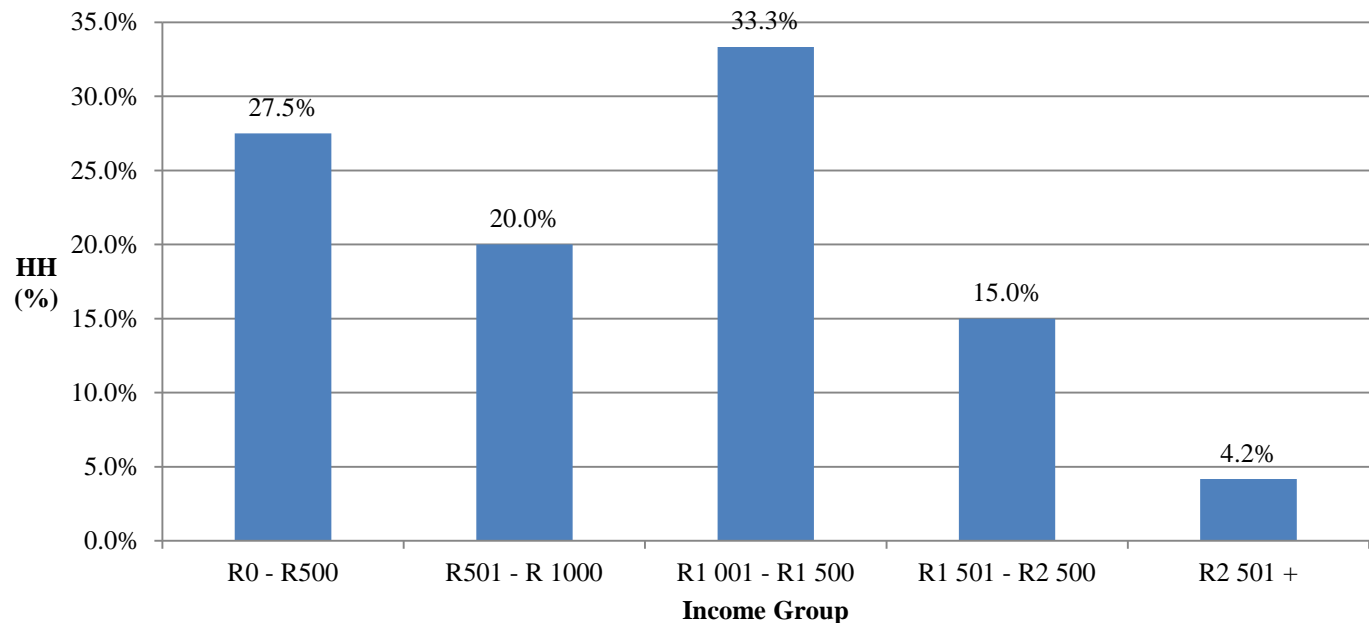
**HH reported faster growth rate
and greater size with bioslurry**

Financial and Economic Feasibility essential for green village development

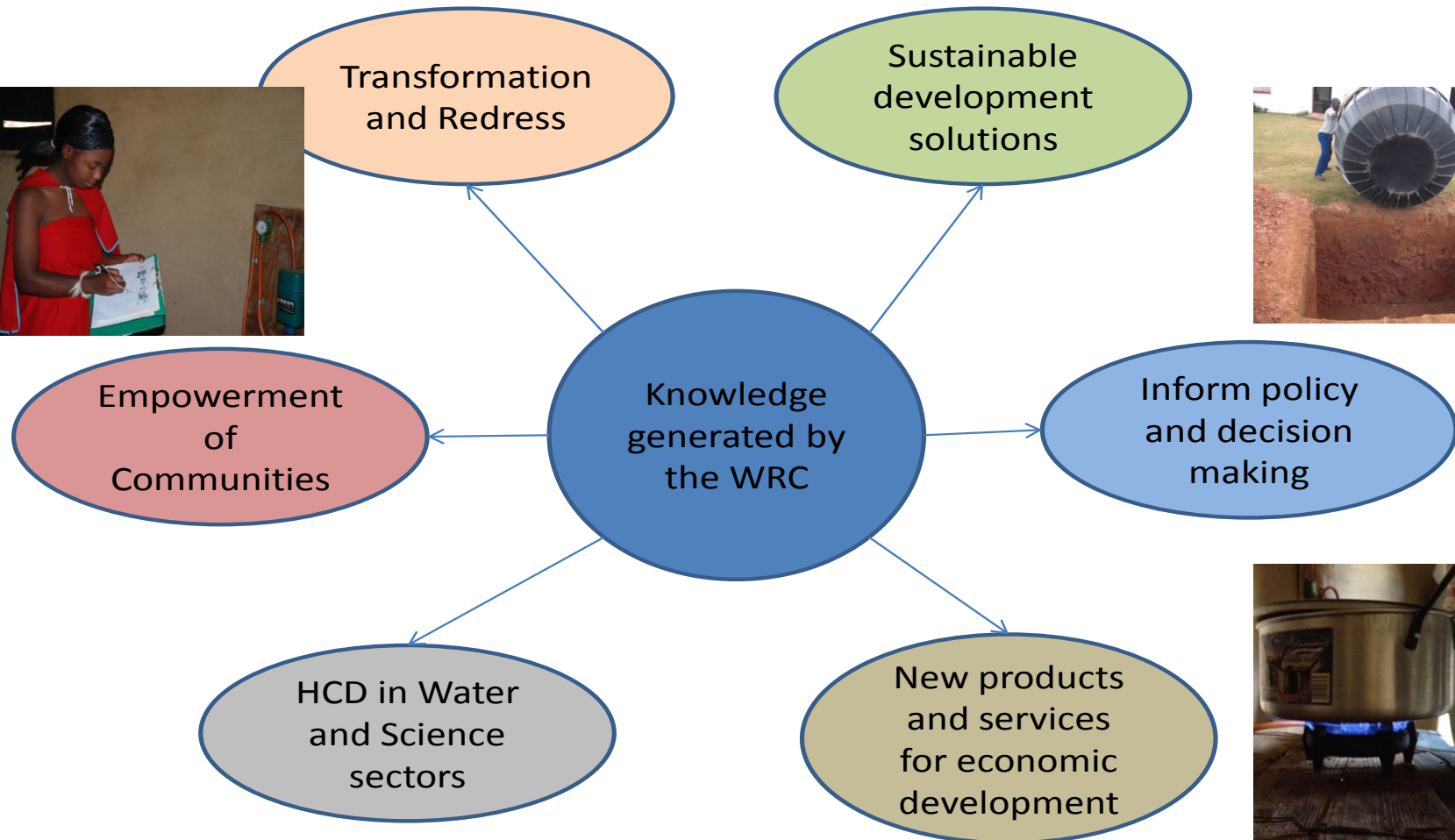
- Financial
 - Capital cost of equipment + installation
 - Benefit: monetary expenses that can be avoided e.g. fertilizer, fuel costs,
- **Financial b/c ratio: 0.98**
- Economic
 - Includes all financial values, plus:
 - Value of health/life benefits
 - Time saving/cost
 - Environmental benefits
- **Economic b/c ratio: 4.83**

Interesting findings

- 96% received income of less than R2500/month
- Average household income of R1090/month
- HH spend 40% of their income on fuelwood



Impact



Local solutions with global impact

- Decreased deforestation, CO₂ emissions
- Provision and security of food and energy

