Build a sustainable inclusive Business Model for Rural Communities in Mali through Biogas Technology

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Introduction
Mali is a country in West Africa, with a population of 19 Mio inhabitants of which more than 80% live from agriculture and livestock [MEE, 2019].

Problem statement
National energy consumption in Mali is based on excessive use of wood and charcoal (more than 80%), followed by petrol (16%) and electricity (4%). In addition, due to demographic pressure and the arrival of farmers from drought-stricken zones further north, zones in South Mali are subjected to increased deforestation to provide more arable land. The growth of the population and the rural migration exacerbate wood consumption in secondary urban centres.

Value chain affected
Lack of proper value chain for organic waste (agriculture, animal, food waste and waste water) in Mali.

Solution approach
Introducing an integrated farming system centered around a biogas system to improve the living condition of rural communities in Mali. The system will help the rural and per-urban communities have different revenues stream by selling the bio-fertilizer using it to boost crop yield and improve the sanitation condition.

Objective(s)
Increase the adoption of Biogas technologies in rural communities which will then help:
- Reduce the cost associated with cooking fuel and chemical fertilisers;
- Provide clean environment (quality air and good health);
- Empower women and improve their social status

Problem tree on low adoption of Biogas

Environmental effect (depletion of natural resource and indoor air pollution) → Poor energy efficiency → Low adoption of Biogas Technologies in Rural Areas

High investment cost → Benefit of Biogas is not well known in rural areas → Sub-optimal performance of Biogas plant

High upfront capital cost → Lack of easy credit for low income rural people → Poor advertisement of the benefit of Biogas

Possible risks and Mitigation

Risks
- Failure of first biogas pilot project and lack of standardisation;
- Information deficit on the biogas technology;
- Initial investment.

Mitigations
- Establishment of a SIBM for a rural community;
- Raise the awareness of local people on Biogas value chain;
- Micro finance

Implementation steps (milestones)
From 2020 to 2023
Acquiring technical skill on Biogas Entrepreneurship
Postgraduate training (Germany)
ISEES Ghana

Business registration with Government
Agency for Investment Promotion (Mali)

Setting up of the integrated farming system (Demo Farm)
Dembe Green Solutions (Mali)

Promotion on the benefit of biogas technology (demo farm)
Social media, TV, Website

Starting installation of Biogas system and advisory services
Dembe Green Solutions

Business monitoring & evaluation
Dembe Green Solutions

Expected costs

<table>
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<tr>
<th>Items</th>
<th>Quantity</th>
<th>Unit</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost</td>
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<td></td>
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<tr>
<td>Registration</td>
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<tr>
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</table>

| Variable costs               |          |        |         |
| Rent (3years)                | 36       | € 130.00 | € 4,680.00 |
| Light bill                   | 36       | € 20.00 | € 720.00 |
| Water bill                   | 36       | € 10.00 | € 360.00 |
| Marketing (media)            | 36       | € 25.00 | € 900.00 |
| salary (Manager)             | 36       | € 300.00 | € 10,800.00 |
| Internet                     | 36       | € 20.00 | € 720.00 |
| Other costs                  |          |        | € 2,727.00 |
| Total variable cost          |          |        | € 20,907.00 |
| Total Costs                  |          |        | € 23,471.50 |

TOTAL COST for 3 year € 23,471.50

Expected outcome(s)

Mobile biogas business

Biogas for thermal energy
Fertilizer
Soil amendments
Livestock bedding

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