In its Vision 2020 plan, Rwanda set ambitious goals for its development. Between 2000 and 2020, the country aims to grow its per capita GDP from $250 to $900. This target implies Rwanda’s economy needs to expand by over 600%.

For Rwanda’s development the emergence of a viable private sector that can take over as the principle growth engine of the economy, is absolutely key.

Currently over 80% of Rwandans are engaged in agricultural production. The Small & Medium Enterprises (SME) sector, including formal and informal businesses, comprises 98% of the businesses in Rwanda and 41% of all private sector employment. Most micro and small enterprises employ up to four people, showing that growth in the sector would create significant private sector non-agricultural employment opportunities.

The Rwanda National Biogas Programme (NDBP) hosted under the Ministry of Infrastructure (MININFRA) is responsible for the management and implementation of domestic biogas sector development in Rwanda. The overall objective of the programme is to contribute to poverty eradication, gender equality, health improvement and environmental sustainability. NDBP requires private sector involvement in the fields of marketing and promotion, training, construction, operation and maintenance, monitoring and evaluation, quality control, extension, credit and subsidy, etc.

A number of challenges have been identified as major constraints that hinder SMEs business development and limit the number of trained SMEs to be engaged in biogas business on a profitable and sustainable basis:

1. High biogas end-user investment cost hampers rapid market growth;
2. Insufficient economy of scale resulting in high indirect costs (promotion, overheads, etc.) incurred by biogas companies;
3. Lack of management, entrepreneurship and business skills;
4. Difficult access to financing.

Based on a feasibility study executed in 2005, MININFRA and SNV have positively assessed the potential of domestic biogas in Rwanda. After a pilot phase in 2007, NDBP was set up in 2008 targeting 3,500 households up to end 2011.

The target group for the utilization of a biogas digester is defined by households who own at least 2 cows and with at least 40 kg of dung at their disposition on a daily basis. Rwanda has a high number of households fulfilling these conditions; a survey held before the start of the programme put an estimation of 110,000 households. It is expected that this number will increase in future as a result of government policies promoting cattle farming and zero-grazing.

MININFRA through its Energy department is leading the development and implementation of the Rwanda domestic biogas programme with support from SNV. NDBP and SNV support include private sector strengthening to professionalize SMEs to leverage their efforts in disseminating domestic biogas and achieve significant market penetration while building sustainable providers of the technology in rural areas.

SNV support to biogas construction companies includes:

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1 Small and Medium Enterprises (SMEs) Development Policy, RWANDA Ministry of Trade and Industry – June 2010
2 Feasibility study, MININFRA & SNV - Rwanda, 2005
- **Private sector development**: support establishment of biogas construction companies and building their technical and business capacities through vocational training (VOSD) to help building a skilled workforce and provide job opportunities for youth;
- **Technical support**: standardization, quality management, Research & Development and quality monitoring systems;
- **Market linkages**: support to build a biogas market and create linkages to farmers through promotion, marketing and networking through women associations, local authorities and sectoral NGOs/associations;
- **Access to finance**: set up of a subsidy system, a biogas credit scheme and funds channeling to farmers through Banque Populaire du Rwanda.

To address different challenges highlighted earlier, some specific activities have been deployed including:
- **High biogas end-user upfront investment cost issue**: cost reduction initiatives undergoing
- **Insufficient economy of scale High indirect cost**: Performance based bonus (paid after construction)
- **Business Development and financial services**: developing private companies financial products and support technical capabilities of SMEs

Private sector support and delivery can be summarized in the diagram below:

In July 2011, 1469 digesters have been constructed benefiting to 6317 persons (workload reduction, reduced exposure to indoor air pollution, mainly benefiting women and children, improved farming through Bioslurry application and improved sanitation).

Currently, 104 SMEs have been trained in construction and linked to the market. These trainings are demand driven. Masons are encouraged to form biogas companies for their growth and sustainable delivery. The challenge resides in the involvement of those trained companies into business; so far there are 53 active biogas companies with a total of 303 masons and 102 supervisors and 3 appliances manufacturing companies.
<table>
<thead>
<tr>
<th>Range</th>
<th>Number of companies</th>
<th>Average biogas digester production per year per company (July 2010 to June 2011)</th>
<th>Volume of Yearly business Per Company (July 2010 to June 2011)</th>
<th>Success &amp; Failure Raison</th>
</tr>
</thead>
</table>
| Very high  | 2                   | 117,5 plants                                                                  | $152,750                                                        | • High commitment /ownership  
• Geographical focus  
• Good collaboration with banks(Running capital), local authorities & Communities  
• Strong promotion  
• Enough hired staff related to specific activities  
• Regular and good payment of staff |
| High       | 5                   | 36 plants                                                                      | $46,800                                                         | • Commitment  
• Geographical focus  
• Reasonable promotion  
• Owner/director involved in all activities  
• Regular payment of masons and technician  
• Good collaboration with local authorities  
• Low collaboration with financial institutions  
• Low management skills |
| Moderate   | 12                  | 14 plants                                                                      | $18,200                                                         | • Very Interested in biogas business  
• Moderate commitment as the owner/ director is involved in other business  
• Not necessarily located in any specific area of operation  
• Sometime supported by the program in Promotion  
• No collaboration with financial institutions  
• Moderate collaboration with local authorities  
• Low management skill  
• Not continuous business which can lead to irregular payment of masons and supervisors  
• Turnover of masons |
| Low        | 14                  | 7 plants                                                                       | $9100                                                           | • Some are new in the business and it’s they 1st experience as a biogas company  
• Others with High expectations with biogas business returns while starting  
• Fully supported by the program in promotion  
• No collaboration with local authorities  
• Most not based in a specific area of operation |
<table>
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<th>Range</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>20</td>
<td>3 plants</td>
<td>$3,900</td>
<td>• Trained without sufficient knowledge of the business</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• High of expectations on biogas returns</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Involved within other business</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Not engaged in promotion as they are waiting for lists of farmers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Low entrepreneurship mind-set</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Lack of operational funds</td>
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<td></td>
<td>• Lack of leadership</td>
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<td>• Lack of confidence</td>
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</tbody>
</table>

The NDBP private sector development efforts have resulted in the establishment of 53 active small entreprises involved in Biogas that seek to grow, create employment and have a positive impact in their community. There are much successes, yet challenges remain.

In order to address them, SNV/NDBP by learning through experience, success and failures regularly adjust his support. As shown in the above table, companies are at various stages of development and tailor-made support will therefore provide to boost activities, among them:

- Entrepreneurship skills development
- Management skills development
- Design financial products for companies (Start up capital; etc...)
- Strengthen localisation of companies and proximity to farmers
- Encourage companies to make biogas their primary business to increase profitability (Economy of scales)
- Support in marketing and promotion skills
- Unhance company links with local communities and authorities
- Performance based bonus (paid after construction)
- Company business coaching
- Inspirit biogas companies to sustain and regulate business behavior
- Field visit on site to other biogas companies
- Continued quality guarantee
SNV support to Biogas companies has shown that it is possible for interested individuals to generate income by creating their own enterprise.

Since 2007, biogas turnover has been multiplied by nearly 10 times from USD 133,800 to projected USD 1.2 million (projections based on annualized mid 2011 performance).

The testimonials below show that -besides the remarkable increases in turnover that have been achieved- biogas construction business can generate financial profits for the enterprises, which underpins the potential viability and sustainability of the emerging biogas sector in Rwanda.

"3 years ago, I was a simple mason in a small company involved in house construction earning very little. Then I heard about Biogas Business and after a NDBP training and certification, I started my own company ECBD. In 2008, we were only 5, I as a supervisor and 4 trained masons, building 3 to 4 biogas plants per month and we used to cover half Musanze District. Now I have 2 supervisors, 6 well trained masons, 10 on the job trained mason, an accountant and me as a manager. We are now building 20 to 25 biogas plants per months and do regular promotion meeting with farmers with local authorities support.

We decided to base ourselves only in 2 Districts: Musanze and Burera - a way to reduce our expenditures and build close relationships with our potential clients. So far our key success is based on how we spend our money; we constantly look on ways to reduce costs while we maintain the same level of quality. I love Biogas! It’s a profitable business”

Theoneste Kaberuka
– ECBD Owner and Manager
"I started in biogas in 2009 and used to work with another biogas company as a supervisor but the business was moving slowly yet the potential was there. In 2010, I decided to start my own company called CEE. The true purpose of our business is to "create and keep a customer." In our company we emphasize on marketing and promotion to create biogas awareness. We now have 5 part time promotion staff, 10 trained and certified masons, 3 supervisors and my wife is our accountant and management assistant; Biogas is now a family business!

We moved from building 4 digesters to a minimum of 17 digesters per month. We are making profits as results of creating good relations with clients by delivering good quality plants."

Abdul Karim Munyabugingo
– CEE Owner and Manager

Some of the key lessons learned include the following:

- Business is done on a commercial basis where companies are able to charge reasonable prices through competition and above all quality is guaranteed through monitoring and after sale service.

- A happy user is the best biogas promoter in the community. Many farmers adopt biogas after seeing its benefits. To this end, the one digester per sector initiative which covers 416 sectors and where best farmers have build biogas digesters has proven to be an efficient promotion and marketing mechanism.

- The rate of involvement of trained companies has been limited. Selection processes should target SMEs interested in small margins per digester with increasing profit based on the volume of constructed digesters. Additionally, companies based in the communities have proven to be successful through their proximity with farmers, this should be encouraged.

- Good biogas companies are the own owned by committed people involved with field activities in contrast with long distance managers.

- Successful companies have proven to be having good management and staff satisfaction (supervisors and masons); the good relation with local authorities is essential for farmer’s sensitization.

- Performance based bonus (paid after construction) is a good incentive to ensure increased involvement and productivity of private companies, as it helping them to invest in marketing at an early stage.

- Increased business development support is fundamental to SMEs that are in their infancy to enable them increasing their chances to get access to finance (working capital and investment). Through a specialized local capacity builder, SNV will increase its support to these companies, to access Business Development Services.

- Creating a biogas market involves making accessible the technology to many households; thus continued cost reduction is a critical requirement and might increase the profitability of the domestic biogas business.
- Public Private Partnership works well in biogas. With strong support from the government to create an enabling environment; private companies take part in disseminating the technology that contribute to rural development and help local governments to achieve their target outlined in respective performance contract³.

- To diversify business opportunities and consolidate companies’ presence in rural areas, SNV and NDBP has started to support these private companies to become distributors of other renewable energies (RE) technologies.

**STANDARD DATA**

- Start and end date of contract: 2007 - 2011
- Consistence of team on the assignment: 0,5 FTE

**REFERENCES**

- Rwanda Vision 2020
- Small and Medium Enterprises (SME) Development Policy, Rwanda, 2010
- Feasibility study, MININFRA & SNV, Rwanda, 2005
- NDBP database

³ In Rwanda, every year, districts sign with the president of the Republic targets (biogas included) to be achieved.