

FINANCING CLEAN ENERGY IN RWANDA

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Country: Rwanda

Sector: Basic Services (Biofuels)

CHALLENGE

Just like the rest of the world, Rwanda continues to face challenges in environmental preservation, energy production and increasing cost of fuel. Actually Households in rural Rwanda depend for more than 90 % on fuel wood to meet their domestic energy needs. To tackle this problem investment has been made in biogas. With the help of the Netherlands Development Organisation (SNV), the ministry has set up a National Domestic Biogas Programme (NDBP) with clear objectives of developing a *commercially viable and market oriented Rwandan biogas sector*; building 15,000 family sized, quality biogas plants by the end of 2011 (first phase of 4 years).

Established in 2007, NDBP Rwanda is still in its infant stage, developing the market and establishing all the required tools for achieving its objectives. These tools include proper financing mechanisms, local authorities' involvement, private sector relationship, etc.

METHOD

SNV ADVISE FOR DEVELOPING A COMMERCIAL SUSTAINABLE BIOGAS SECTOR

SNV has developed expertise in supporting setting up biogas sectors in various countries. This expertise includes technical support, advocacy and institutional set up. The integrated advisory services given by SNV – Rwanda to NDBP include close support to the programme for its set up and developing various tools needed for strengthening the programme activities. Among others, financial systems' support plays a vital role in the development of the programme and grants to small farmers an easy access to sufficient initial capital they need to acquire a biogas system.

PRACTICES AND LESSONS LEARNT

Microfinance for biogas investment

Biogas sector deployment needs various stakeholders to build up and execute various tools including financing. Credit system developed for biogas is a great tool used by NDBP – Rwanda; enabling small farmers to get access to finance for their investment in clean energy.

Overview of financing of domestic biogas plants

Currently in Rwanda, there are biogas plants of 6 and 8 m³. The size best suited for Rwandan rural farmers and promoted by the NDBP-Rwanda is that of 6 m³ for technical and economical reasons (best relation cost – responding to needs of families). The 6 m³ costs an average of 630.000 Rwf (1,155 USD¹) and farmers can finance this investment as follows:

DESCRIPTION	AMOUNT (RWF)	AMOUNT (USD)
Farmer's minimum contribution in materials (sand, stones, unskilled labour, etc.)	150,000	275
Government subsidy \$350	200,000	367
<i>Remaining balance for farmer to pay in cash or through credit</i>	<i>280,000</i>	<i>513</i>
Total construction costs	630,000	1,155

The financing of a biogas plant is subdivided into 3 main components which are (1) In kind (cash) contribution given by the farmer that may vary depending on location; (2) A flat subsidy donated by NDBP; (3) Cash amount given by the farmer. He can finance this component by using his own cash or go for a loan.

¹ 1 USD=545 Rwandan Francs

Developing a loan product

Purpose of the loan: The loan is intended to fill the gap between the farmers investment (in kind or in cash) plus the subsidy and the expected cost as shown in the table above.

In developing such a product, there are some criteria we based our research on to develop a product that will enable a viable installation and allow an investment paying back itself. These are to have a minimum of two cows² (technical requirement); a stable feeding (zero-grazing policy is enforced in Rwanda) enabling the farmer to have maximum dung; and assuming a milk production \geq 8.5 litres/day.

With such variables, a summary of the status of a farmer is shown in the table below:

Item	Value	Unit	Total amount (in Rwf)	Total amount (in USD)
Asset value of 1 cow	400,000	Rwf		
Economic life cycle	8	Yrs		
Milk production per day	8.5	Litres ³	2,040	3.75
Direct cost of feeding cows (32%)	330	Rwf	660	1.21
Indirect expenses of keeping cows (43%)	440	Rwf	880	1.61
Total daily expenses (75%) (d+e)	770	Rwf	1540	2.82
Net daily income (c-f)			500	0.93

From the summary above, a monthly cash flow of the farmer has been estimated and the contours of the loan product were drawn. Taking into consideration limits imposed by existing financial products within Banque Populaire du Rwanda (BPR) which are:

Maximum time duration: 36 months (3 years)

Minimum interest rate: 13% per annum

It was then possible to have all technical terms for the biogas loan product.

The cash flow estimation per household is as follows:

Description	Amount (in Rwf)	Amount (in USD)
Net daily income	500	0.92
Monthly cash flow	15,000	27.52
Annual Free Cash Flow	180,000	330.28
Estimated minimum annual CF (67% of c)	120,000	220.18
Estimated minimum cash for 3 years (d*3)	360,000	660.55

The final terms of the financial product are therefore:

- 34 instalments in 36 months due to a 2 months grace period enabling the farmer to start reimbursement when gas production has begun. The grace period is an incentive for farmers who doubt about the full function of a biogas plant as a source of energy;
- A 13% interest rate, which is the minimum rate BPR can charge. The interest is a parameter to consider when developing a loan product as cost has to be as minimum as possible to attract and be accessible for rural households; for comparison in local commercial banks, loans are charged an average of 17% p.a;
- From cash available to farmers and parameters above, it has been concluded that the maximum amount that a small farmer can afford to repay is 280,000 Rwf (515 USD). Therefore the loan amount has been fixed to a maximum of 515 USD. As calculations have been made on a 6m³, those who want to take bigger digester will finance the balance amount as they are better off.

² In Rwanda farmers keep mainly milk cows

³ A litre of milk is sold at an average price of 120 Rwf/l (0.20 USD)

- A monthly instalment of 10.000 Rwf (18 USD). This instalment is fixed to make it simple to understand and is less than the amount spent by a typical household buying fuel wood, charcoal and/or kerosene.



“We use 400 Rwf (0.73 USD) per day buying wood for cooking and prices can go higher in the rainy season” **Mr. Nzeyimana; farmer and biogas user**
 “We used to spend a lot of time and money collecting wood. Thanks to biogas, we now have more time and save money that we use for other activities for our development” **Mrs Odette K., female teacher and biogas user**

Summary of SNV role in developing Rwandan (microfinance) biogas product

1. **Fund Brokering:** negotiating funds for refinancing the biogas portfolio at affordable terms (FMO⁴). FMO and BPR are in negotiations for FMO to avail to BPR a 5 Millions Euros loan to be used in financing biogas portfolio.
2. **Organisational Strengthening:** assistance in identification & negotiations with local bank (BPR);
3. **Technical Assistance:** funds circuit and financial Product development tailored to customer capacity and need;
4. **Institutional strengthening:** Defining specific responsibilities of each party involved in the business;
5. **Promotion:** in addition to promotion of biogas in general, marketing of financial product is done with coordination of BPR marketing.

STEPS FORWARD

1. Product launch and close monitoring for possible adaptations
2. Training and marketing for bank officers to ensure proper transfer of ownership of product to bank for further management of the product;
3. Product follow up and (if necessary) re-alignment by the bank with the help of the programme

LESSONS LEARNED

- Small farmers are eager to take loans and invest in biogas: for a 20 year investment, a middle term loan seems to be adequate
- If monthly payment is equal or less to money used to buy wood, farmer is less reluctant to invest in biogas;
- Standardised loan in the beginning is easy to administrate and understand;
- Market research and external support is important for a good loan product mainly when there is a weak understanding about biogas and customers specific needs;
- Convincing the bank to invest in a low – end product is a long process
- Defining terms of credit can take much time and much of the process is internal to the bank;
- Education to farmers in loan management and culture is crucial to the success of the product;
- A clear differentiation between subsidy and loan has to be drawn and clearly explained to farmers to avoid complications in getting back loaned money;

⁴ FMO : Netherlands Development Bank

The first challenge is to create enough demand to make the product sustainable and justifiable for the bank. Farmers are willing to invest in biogas but we need to carefully monitor the trends and be able to react accordingly in adapting and updating the product.

The second challenge is the farmer's financial capacity: biogas is not the only investment the farmer wants to make and consideration of the product is that the farmer has no other loan. In reality the farmer wants to invest in biogas but also takes loan for seeds, consumption, investment in other sector, etc. Further changes might be needed to be made to allow the farmer having more flexibility in taking a biogas loan, e.g. longer loan period.



Biogas is a good investment for small farmers

"It has changed their lives noticeably, and they do not present as much risk as I have thought" **Bank** executive after visiting a family with biogas plant

"We know how to manage loans and we are used to them, all we need is better conditions from the bank" Farmer wanting to invest in biogas

Another challenge is to have professionals and clients performing well: as bank loans are normally assessed; farmers need much more assistance from NDBP to master management of financial facilities made available to them within the programme. This attention might include support to bank management in educating people about financial culture and planning.

One of the risks faced in microfinance is default of loans. In biogas the risk might be elevated due to local perception and the combination of subsidy and loans; hence much quality information is needed and an involvement of local authorities to mitigate it.

The financial supply side (BPR) needs also much attention from the programme to stimulate it to invest and own the product as well as training bank officers in biogas technology. It is also crucial for the bank to have an option of getting easy facilities of refinancing as to avail financial resources for a specific sector. For instance though the refinancing is secured, the process between BPR and FMO have been taking too much time so it is crucial for those developing such product to ensure that refinancing process be speeded up as much as possible and deal closed in time. In addition some Innovative tools could allow refinancing, like partnerships with big private companies that can finance a specific number of biogas plants under new concept like corporate social responsibility.

Finally, the carbon credit market is a promising source of finance for refinancing the subsidy part of the programme and it is a promising market for NDBP and Rwanda in general.

Tailored microfinance product means evolving with client's demand and needs. The future of biogas product is to evolve with these needs and be able to adapt itself to them while keeping the bank's conditions fulfilled.