

SUSTAINABLE CHARCOAL – A LOCAL AND RENEWABLE ENERGY SOURCE OF THE 21ST CENTURY

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Sector: Renewable Energy

CHALLENGE

In the Democratic Republic of Congo (DRC), about 95% of the energy consumed comes from biomass, mainly in the form of wood in rural areas and charcoal in urban areas. For the city of Kinshasa, the capital of DRC, it is estimated that 490,000 tons of charcoal is consumed per year, for a total value of USD 146 million. More than 300,000 people work in this field, most of them at the production/transformation stage, in rural areas about 250 km from the city¹.

Despite its importance to satisfy energy needs of the great majority of the population and as a sector of the economy, the biomass energy sector remains unregulated, not structured and informal. This has four major consequences:

- Actors in the energy biomass value chain operate mostly in the informal sector and remain in poverty
- The Government gets a very limited revenue from an important sector of the economy
- Wood is cut from natural forest leading to deforestation, in particular in areas producing charcoal for big cities; In the national REDD+ strategy woodfuel² is considered as one of the three main cause of deforestation
- Biomass energy is used inefficiently, leading to important expenses for the users and respiratory diseases due to hazardous smoke emissions



An improved charcoal kiln built during a training session, Yolo village, July 2014

However, the situation does not need to be this way and experience in other countries (Kenya, Bénin, Tchad, etc.) show that the biomass energy sector can be structured and regulated. In addition there are in DRC large areas of savannahs which are currently under-used and which could be used to produce sustainable woodfuel on a large scale.

Despite the importance of the biomass energy (or fuelwood) sector, there is very little interest from donors and political will to intervene to improve it or to promote alternatives such as LPG. The common motto of decision makers in DRC, and in many countries alike, is that large dams³ will provide cheap electricity to the entire population and that this electricity will be used as a clean source of energy for cooking. Woodfuel is commonly seen as an old fashion source of energy used by poor people, far from

¹ 2011 data from the Makala project implemented by CIRAD with funding from the EU

² Woodfuel comprises all types of biomass used as fuel to produce energy. In DRC, it comprises mainly wood and charcoal.

³ DRC has a hydro-potential estimated at 100,000 MW, including 40,000 MW concentrated in the great Inga site.

the vision of modernity and emergence prevailing in DRC. As a result of its lack of interest, there is very little reliable data available for this sector.

However, with the realisation that universal access to electricity is a far-fetched goal which will take decades to achieve¹ and that electricity is not a cheap energy source for cooking, some initiatives to promote woodfuel as a clean energy source have started in recent years. In particular, the Agenda Action being prepared by the DRC Government in the framework of the Sustainable Energy for All Initiative (SE4All) emphasises on biomass energy with a number of recommended actions, such as: promotion of alternatives to biomass such as LPG, biogas, electricity, briquettes, etc., promotion of improved cook stoves and improved kilns for charcoal production, development of 3 million ha of energy plantation to supply more than 90% of the wood-fuel demand with renewable sources.

CLIENTS

One of the first project which focused on biomass energy was the "Makala² project" funded by the EU and implemented by the French research institute CIRAD during 2010 - 2014. This research project achieved two main results.

The SNV's sustainable charcoal project followed and was able to build on the momentum created by this initial project, in particular using the baseline data of the wood-fuel sector in Kinshasa and the simple land management plan tool. These were used to operationalise the theoretical concepts and bring actual sustainable charcoal to the users in Kinshasa.

The Sustainable Charcoal project aimed at creating a sustainable charcoal value chain to supply Kinshasa. The approach taken built on the work done by SNV's REAP³ team on REDD+ compatible fuelwood value chain. It aimed at intervening on 4 key steps of the value chain: production, transformation, transport and retail.



REDD+ compatible fuelwood value chains

The project had 3 levels of intervention with different types of actors:

- Production: support to charcoal producer cooperatives to produce sustainable charcoal following strict criterias defined in a participatory way
- Distribution: structure the different actors of the value chain (from producers to retailers) and raise awareness of customers so that sustainable charcoal can be made readily available to customer in a cost effective way.
- Policy framework: raise policy and decision makers' awareness on issues related to woodfuel production and use as well as contribute to the development of an institutional framework supporting the development of the sustainable charcoal value chain

1 In the SE4All Agenda Action, it is estimated that by 2030 more than 1/3 of the households will have access to electricity with individual solar kits or mini-grids providing basic lighting and charging services

2 Makala means charcoal in the Lingala language

3 The REDD, Energy and Agriculture programme of SNV was set up in 2013 to tackle across the landscape causes of deforestation linked to production/use of energy and agricultural activities

The Sustainable Charcoal project was carried out between January 2014 and November 2015.

The main activities carried out to reach the project objectives are described below per component

Production:

- Definition of criterias for sustainable charcoal in a participatory way
- Organisation of charcoal makers in cooperative of producers
- Development of land use management plans at village level to identify and quantify sustainable sources of wood to be used for charcoal production and identify areas unsuitable for charcoal production
- Capacity building on naturally assisted regeneration of forest
- Capacity building on energy efficient (improved) carbonisation techniques
- Setting up monitoring and certification committees within the cooperatives

Distribution:

- Setting up transporter, wholesalers and retailer networks
- Strengthening links between the different networks
- Developing a marketing campaign for sustainable charcoal aimed at raising demand for this product, especially by bottom of the pyramid customers

Policy framework:

- Organisation of regular round table meetings with relevant stakeholders
- Creation of a woodfuel working group with local authorities in Kinshasa
- Policy influencing (local authorities, Provincial Minister)

SNV tackled the fuelwood sector with a holistic value chain approach involving a variety of stakeholders. It started by working in the field, directly with charcoal producers, who have to be part of the solutions. The results of the work in the field were used as evidence to reach out to local authorities and raise their awareness on the issues and discuss potential solutions. The Provincial Minister of Environment and Gender in particular was heavily involved in a number of activities. She was instrumental to support the development of a new Provincial Order on taxes related to woodfuel.

Gender and pro-poor aspects were central to the methodology implemented. Women are the main users and retailers of charcoal. The communication campaign to promote sustainable charcoal was primarily targeted towards woman. Work with retailers was mainly done by women and the marketing tools developed in the framework of this project were mainly geared towards women customers. Although charcoal is mainly produced by men, women have a key role to play, often in charge of planning and accounting. Women were therefore encouraged to join charcoal cooperatives and some of them were elected in the cooperative managing board.

Charcoal producers are often poor farmers. By joining a cooperative they were able to join forces and put their small saving together to acquire new equipment. With better planning, charcoal makers are allowed to sell their production together as a group instead of individually, thereby gaining a better bargaining power with the transporters and wholesalers.



Training on improved carbonisation in Yolo village, Kinshasa Province, July 2014

OUTCOME

SNV has built the capacity of 10 new cooperatives of charcoal producers comprising a total of 329 charcoal makers who used to produce charcoal individually. The cooperatives are now structured with status and a code of conduct. The 329 charcoal makers trained are now able to use improved carbonisation techniques, thereby producing better quality charcoal while using less wood: savings were estimated at about 1.6 tons of wood per ton of charcoal produced¹. The charcoal makers are also able to help the forest to regenerate based on natural regeneration techniques which they were taught.

6 land use management plans were created in a participatory way in 6 villages and 4 others of these plans were updated. These plans allow to define the area of forest or plantation that can be used for charcoal making and the maximum rate of wood cutting that can take place within the defined areas.

Transporters (7), wholesalers (7) and retailers (4) were organised in networks and are now able to work together and to link more efficiently with the charcoal producers.

Marketing tools were developed to promote sustainable charcoal especially to poor women. Traditionally, poor families buy charcoal in small quantities on a day to day basis. Charcoal is sold in small plastic bags which in turn are used to light the stove. The sustainable charcoal project worked with a local NGO to produce reusable bags made with old newspaper. These bags hold 1kg of charcoal.

Finally, a Provincial Order², was signed in November 2015, redefining the taxes to be paid for woodfuel in the Province of Kinshasa. The taxes defined in this text are lower and more convenient to pay than what was the case before the Order³. The aim is that woodfuel actors in the value chain will prefer to pay taxes rather than "informal fines" which currently prevail and which are nothing but bribes to local government officials. Part of the revenue from the tax will go to the National Forest Fund which will use this money to plant trees in woodfuel producing areas. This Order now opens the door to a differentiated tax rate which would allow sustainable woodfuel to be less taxed than standard charcoal. With the efforts of the National Forest Fund (see below) similar orders are being signed in various Provinces during the first quarter of 2016. This shows that the project managed to create a snowball effect and its legacy will help to make a long lasting and sustainable change in the country.

IMPACT

324 farmers have a higher income through better quality charcoal making. These skills got some members of 6 cooperatives to sign a contract with a large scale acacia plantation to produce sustainable charcoal. Better income for the charcoal makers is due to time saved during carbonisation (3 days vs. 7 for a 5m³ kiln).

During the course of the project, 6,248 50kg bags of sustainable charcoal were produced, given an estimated 700 families (or 3,500 people) regular access to a clean and sustainable fuel for cooking. During the course of this pilot project it can be estimated that about 1000 tons of CO₂ were saved by the production of sustainable charcoal⁴.

According to data from the Makala project, more than 290,000 people are involved in wood fuel production to supply Kinshasa. If the use of sustainable charcoal was to become universal, all these people could in theory have a better income.

LESSONS LEARNED

Developing standards and establishing criterias is good but these have to be monitored and enforced. The project opted to do this on a voluntary basis with the cooperative committees in charge. This of course creates risks. In the future an institutional mechanism should be developed to embed this monitoring and enforcement in services provided by the local authorities. This will require a way to finance these local agents and extensive trainings.

Not enough time and resources were dedicated to marketing and awareness raising campaigns during the course of the project and thus sustainable charcoal is not visible enough; however, the strong involvement of the Provincial Minister in charge of Environment in the project had a positive impact.

Similarly, more efforts should have been dedicated to create a commercial demand for sustainable charcoal and reach the bottom of the pyramid. The newspaper bags were made available too late in the course of the project to really bring a major change in charcoal user's behaviour. However, it was noticed that at wholesale level the good quality charcoal and the green bag it came in attracted

1 Even with improved techniques, charcoal making is still made traditionally as opposed to industrially and the efficiency of kilns vary widely, depending, among other factors, on: type of wood, skills of the charcoal makers, weather, size of the kiln, etc. During trainings, weight of samples of wood and charcoal was measured and an average efficiency gain from 15 to 20% was calculated. This efficiency gain is also confirmed by some charcoal makers who have been using improved techniques in recent months.

2 In French: Arrêté Provincial

3 The permit to cut wood for wood fuel production went from 130\$ for 3 months to 55\$ for 1 year. The permit can be bought in a local bank close to the production area instead of in Kinshasa 100 km away.

4 Based on methodology AMS II G for improved carbonisation

interest, high demand and willingness to pay a good price¹. More should be done for this demand to trickle down to poor customer. This would be helped if a lower tax rate is applied for sustainable charcoal and/or other fiscal incentives were applied to sustainable charcoal.

The project attracted a lot of attention, in particular from various development partners. It is hoped and expected that the approaches and tools developed will be scaled up in the framework of different upcoming projects. It is also hoped that the new piece of legislation introduced in Kinshasa will inspire other Provincial Governments.

TESTIMONIALS

"Before the project, we, charcoal makers, felt marginalised and kind of useless. We were not aware of the importance of our job for the country. We also did not realize that we could do things differently, in a way that is more profitable for us and better for the environment. The sustainable charcoal project empowered us and made us realize that we were part of the solution. Now some members of the charcoal cooperatives set up during the course of the project came together and created a national charcoal makers association. Our goal is to reach out to our colleagues charcoal makers in the whole country, so that they can be proud of their job, do it better and, with us, advocate for better woodfuel policies."

M. Emmanuel, President of a village charcoal cooperative

"I thank SNV and its partners for having introduced sustainable charcoal in Kinshasa. This is an important innovation that will help reconcile women who cook to feed their families with our environment. This also gives opportunities to charcoal makers in rural areas to make a better living. On top of that, the sustainable charcoal is a very good and efficient fuel for cooking. I tested it myself"

Mrs. Thérèse Olenga, Provincial Minister in charge of Environment, Gender, Education and Information

STANDARD DATA

- Project duration: From January 2014 to November 2015
- Consistence of team: The project team comprised 3 SNV staff, 2 LCBs (one for cooperatives structuration and one for development of land use management plans) and 2 external consultants (one trainer on improved carbonisation techniques and one for the baseline survey)
- Number of PP-days already invested:
 - SNV Staff (local): 670
 - SNV Staff (international): 118
 - LCB/local consultants: 341

1 The price of charcoal is not fixed and varies depending on the seasons and the offer vs. demand.