



Charcoal plantations reduce deforestation

by Meindert Brouwer

Tree plantations for charcoal are an important solution to reduce deforestation and pull people out of poverty at the same time. Worldwide Fund for Nature WWF, local ngo's and tree planting farmers are proving that every day in the eastern Democratic Republic of Congo (DRC).

The production of charcoal is combined with the production of energy-efficient cook stoves for a greater impact. Charcoal plantations can significantly reduce pressure on natural forests all over Africa and in rural areas around the world. Every farmer family should have a couple of charcoal trees next to their house.

EcoMakala, the solution is called, 'makala' being the Swahilian word for charcoal: sustainable charcoal produced in tree plantations set up by WWF and its partners to reduce pressure on forests inside Virunga National Park, where people have gone to burn charcoal and collect firewood on a massive scale in the past two decades.

Developing tree plantations for charcoal outside Virunga National Park was part of a large scheme to tackle one of the three major threats to Virunga: deforestation. The other big threats are poaching and plans to drill for oil. The scheme to reduce deforestation was twofold: the Congolese Institute for the Conservation of Nature (ICCN) of DRC was to scale up patrolling on the borders of the park by increasing its number of ecoguards to keep charcoal burners and firewood collectors out. Parallel to that, WWF and local partner organisations were to create new sources of charcoal outside Virunga by developing tree plantations and hence reforest the degraded hills and mountains outside the national park. Virunga is the oldest national park of Africa and one of the most important on the continent because of its variety of landscapes and

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wildlife, including elephants, chimpanzees and the last remaining mountain gorillas.

PRESSURE Pressure on the park for wood energy and bush-meat hunting had become huge after hundreds of thousands of people fled to eastern DRC to escape the genocide in Rwanda and Burundi in 1994. More than twenty years of war between militias in eastern DRC followed and today armed gangs remain to be a threat. Due to the acts of war, people fled to the city of Goma, located just outside Virunga National Park. In 1994 Goma had 15,000 inhabitants. In 2006, the year the EcoMakala project of sustainable charcoal started, Goma had 800,000 inhabitants, who needed 50,000 to 60,000 tons of charcoal annually for cooking. Imagine, that is 50,000,000 to 60,000,000 kilos of charcoal per year. 80% of the charcoal sold in Goma came from the natural forest in Virunga.

Ten years later, in 2016, Goma has 1.2 million inhabitants. Only 3 % has access to electricity and not 24 hours a day. The government has started a project to generate hydropower in one of the rivers in the region. 97% of the households in Goma still cooks on charcoal and firewood. It is estimated that they need around 115,000 tons of charcoal per year for cooking. Luckily, supply of wood energy has changed for the better. The destruction of the forest in the national park

of Virunga for charcoal production has decreased. Now a substantial part of the charcoal sold in Goma is supplied by farmers in the region who have a new source of income. Thierry Lusenge (36) of WWF-DRC, spokesman of the EcoMakala project, explains how it has all evolved.

CHAIN Lusenge: 'In 2006, after twenty years of war, we began by helping to settle landrights of small holder farmers. That provided the basis to actually start. We did not deal with farmers individually. WWF concluded contracts with almost 70 tree planting associations, which are in fact local grassroot ngo's.' He continues: 'Together with the associations we developed a production chain and a marketing chain for sustainably produced charcoal. First we helped the associations to set up nurseries for tree seedlings. We provided them with seeds and bags for the seedlings. Then we trained the associations to select, train and assist individual farmers to become tree planters and caretakers of their own tree plantations. The associations received a fee per hectare. The farmers received seedlings free of charge and starting capital per hectare.'

The project consisted of two main components. The first one was that WWF-DRC obliged the tree planting farmers to save part of their field for food production, so they would have food and short-term income while waiting for the trees to grow. The first harvest of charcoal from fast growing trees is in year 4. The second component was securing income from charcoal every year. Tree plantations were divided into three blocks. Every year farmers would harvest in one block only, so that way they would have a permanent income from charcoal.

The size of small holder tree plantations outside Goma varied from 0.25 to 5 hectares. More than 10,600 hectares of tree plantations were realised during the period 2007 - 2016. After initial doubts among farmers in the beginning, other small holder farmers around Goma, who were not part of the EcoMakala project, also started to grow trees for charcoal. They noticed that charcoal from tree plantations is good business. Despite disruptions by armed gangs the EcoMakala project has become a remarkable success.



Planting tree seedlings.



Above: tree plantation with Eucalyptus (*Eucalyptus saligna*) for charcoal and timber outside the city of Goma in eastern DRC. From left to right: Thierry Lusenge, sustainable energy program manager of WWF-DRC and his colleagues Hicham Daoudi, Ernest Ntumba and Gregory Claessens (WWF-Belgium).

Right: start of charcoal production.





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MARKETING Marketing the charcoal played an important role, Lusenge tells: ‘We also assisted the farmers in setting up cooperatives. Organized that way, tree planting farmers were able to sell their legal charcoal for prices competitive to illegal charcoal from Virunga. Around the year 2010, trade in charcoal in and around Goma was worth an estimated 30 million US dollars a year.’

Species in tree plantations vary. They may be indigenous species, but also exotic species, like eucalyptus. They may grow fast or not. The charcoal is produced on the spot, at the tree plantation. The wood of the trunks of the trees may also be sold as timber to build houses. In that case the branches are used for charcoal. Most of the exotic tree species which are used for charcoal, regrow after cutting. These species can be cut in four cycles during 20 years. After that, replanting is necessary.

Rotating capital is part of the scheme to secure financial sustainability of the project in the future without further dependency on funds. In fact it is self-finance. Each tree-planting farmer has to refund 20% of the income of the harvest in years 4, 5 and 16 to the tree-planting association, which reinvests the money to produce tree seedlings to respond to the needs of small holder planters and to expand the project as well. In order to maximize the production of charcoal outside Virunga, WWF-DRC also negotiated with large landowners in the region and convinced them to plant trees for charcoal on their cacao and coffee plantations. 10,600 hectares of small holder tree plantations for charcoal are not sufficient. 25,000 hectares of charcoal tree plantations are still required to satisfy the need of the population in Goma. Nearby there is not much land available anymore, due to the large population density in the region, which ranges from 300 to 600 people per km².

COOK STOVES ‘A mix of different solutions is necessary to meet the need of wood energy supply in a sustainable way,’ Lusenge explains. That’s why WWF-DRC has undertaken another initiative: local production of energy-efficient cook stoves. This has become a remarkable success too, just like the charcoal plantations.



Improved, energy-efficient cook stoves in the making.



Cook stove sales.



The proof is in the cooking.

I AM AGAIN FEELING ALIVE

‘Thanks to EcoMakala, I am able to meet the needs of my family and pay for the education of my children. I stopped selling fruits on the streets and carrying charcoal and other products for less than 1 \$ a day. After the death of my husband during the war, I am the only one to look after my 5 children. This was difficult with the little income I was making from the hand jobs. However, not only am I now involved in preserving the Virunga Park, I am again feeling alive ...’
Helène Batachoka, member of the Improved Stoves Producers Network (REPROFCA).



Biogas in portable tanks is the next project.

Since 2009 a growing network of women in Goma – in 2016 more than 600 women organized in 20 local ngo's –, has produced over 87,000 energy-efficient cook stoves, which reduce charcoal usage by 50%. That is a major reduction. 75,500 cook stoves have been sold in Goma, which would need 140,000 cook stoves in total to cover the whole city. The other 11,500 cook stoves were sold in South-Kivu and even in DRC's capital Kinshasa.

However, the population will keep growing in and around Goma and so will the need of energy. While WWF-DRC is involved in establishing more tree plantations, biogas in portable tanks is the next project, Lusenge tells. What about the sun? It shines a lot in Goma, although rainy seasons come with clouds. Could solar cook stoves be an option in the future, I ask Lusenge. 'No,' he answers, 'we have already tried them out, but the adoption rate was low because they were only useable during the day, it was difficult to control the heat, food was burned and it was a risk.'



Charcoal transportation.



Virunga National Park, seen from Rwanda.
Photo © All for Nature Travel

ECOMAKALA PROJECT, RESULTS

The EcoMakala project was mainly funded by the European Union, Ministry of Foreign Affairs in the Netherlands (Department of Development Cooperation), Swedish International Development Cooperation Agency (SIDA), Congo Bassin forest Fund (CBFF), WWF Belgium, WWF Sweden, IFDC (International Fertilizer Development Center) and Kellogg corporation. WWF-DRC has received two awards for the EcoMakala project: the International Ashden Award in 2013 and the Energy Globe National Award in 2016. The EcoMakala project shows that nature conservation in Central Africa is also about meeting energy needs and about job creation and poverty alleviation.

Results

1. More than 10,600 hectares of tree plantations were realised during the period 2007 - 2016.
2. Less pressure on natural forests in Virunga National Park. Fewer people go in to burn charcoal and collect firewood.
3. Less soil erosion outside Virunga because of the newly planted trees.
4. Increase of soil fertility.
5. Job creation in a new, legal charcoal product chain: producers of tree seedlings; more than 8,000 farmers have diversified their product range and have become sellers of charcoal and timber; charcoal makers (in some cases farmers have become charcoal makers themselves); charcoal wholesale; transporters of charcoal; charcoal retailers.
6. Reforestation through tree plantations may result in additional REDD+ payments to farmers in the future.
7. Replication in North-Kivu. The number of hectares of tree plantations for charcoal will keep growing.

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Energy efficient cook stoves, results

1. Since 2009 a growing network of women in Goma has produced over 87,000 energy-efficient cook stoves, which reduce charcoal usage by 50%.
2. Significant reduction of emissions of greenhouse gas CO₂.
3. Job creation for more than 600 women producers.
4. Sales in Goma, South-Kivu and Kinshasa.

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