What lessons has the project learned so far?

Charcoal has an image problem. There is a widespread and often deeply-held perception that charcoal is inherently 'bad'. In December 2014, Kilosa District Council went so far as to stop the villages where the project is working, from continuing with production because of concerns about the sustainability of the model. To address these concerns, a participatory review of the model was carried out by representatives from the District Council, TFS and academics. The review team concluded that the model was sound and should continue.

Charcoal's 'bad image' is justified given the uncontrolled production that is the *status quo* in Tanzania. To shift the sector towards sustainability, **there is an urgent need for illegal production to be stopped**, particularly in environmentally sensitive forests such as Coastal Forests. Central and Local Government need to limit themselves to issuing permits only for charcoal that can be traced back to a sustainable source. At present, many districts issue permits in the absence of sustainable management plans; and without monitoring producers' compliance with their permits.

Transforming Tanzania's charcoal sector is possible…if the political will is there. If not, then Tanzania locks itself into a downward spiral of deforestation, environmental degradation and rural poverty.

Making biomass energy production more sustainable is fundamental to national energy security; to reducing deforestation; and to protecting ecosystem services.

The MJUMITA sustainable charcoal model has demonstrated that an alternative scenario is possible. The MJUMITA sustainable charcoal model can contribute to rural development whilst simultaneously incentivizing communities to conserve their forests.

With 15 - 20 million ha of woodland on village land of which 2.3 million ha are already in village land forest reserves, the potential to scale up is significant.

What are the project's plans for the future?

The Transforming Tanzania's Charcoal Sector Project has funding from the Swiss Agency for Development Cooperation until August 2015 to work in 10 villages in Kilosa District. In addition to consolidating the model in the 10 villages, the project will be:

- working with Kilosa District Council to develop a district harvesting plan;
- conducting further ecological research into the sustainability of the model;
- developing guidelines for other districts and communities to establish the model; and
- developing a communication and advocacy strategy to promote biomass energy in Tanzania.

The project will also be working closely with the Ministry of Energy and Minerals and the Ministry of Natural Resources and Tourism to push forward Tanzania's draft Biomass Energy Strategy with a view to promoting a more supportive policy environment for the development of the national biomass energy sector. The project is planning a second 5-year phase with a focus on scaling up the model to other parts of Tanzania.

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A vibrant, pro-poor and sustainable charcoal sector in Tanzania is possible!

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Shirika la Kuhifadhi Misitu ya Asili Tanzania

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

Transforming Tanzania's Charcoal Sector Project

The MJUMITA sustainable charcoal model

Biomass energy is Tanzania's most important energy source and will comprise the majority of the national energy supply for at least the next 20 years

It is estimated that charcoal and commercial fuel wood generated approximately **TZS 1.6 trillion (~$1 billion)** in revenue for more than 300,000 producers, transporters and traders in 2012.

96% of households in Tanzania use wood fuel or charcoal for cooking and heating.

91% of households in Dar es Salaam use charcoal for cooking.

Forests are being cleared faster than they can grow back

Demand for charcoal and fuel wood in Tanzania (~62 million m^3/yr) exceeds the national, sustainable supply (legally harvestable gross annual increment = ~43 million m^3/yr) resulting in an annual deficit of ~19 million m^3/yr of wood.

The biomass energy sector is largely un-managed

At present, almost all charcoal is produced either illegally in reserves or from forests / woodland on village land for which no sustainable harvesting plan is in place. Almost all charcoal reaching the market in Tanzania is produced inefficiently and unsustainably. As a result of the zero-management of charcoal production, it has become a significant driver of deforestation and forest degradation. Efforts to 'ban charcoal' will be (and have been) ineffective in the absence of affordable, available alternatives for urban households to cook with.

Many decision-makers perceive charcoal to be a problem that can only be solved by: fuel-switching; adoption of fuel-efficient stoves; and the expansion of plantations of exotic tree species. Despite many efforts to promote these strategies, demand for charcoal and wood-fuel has resolutely increased with initiative after initiative failing to dent the demand. Whilst fuel-switching and more efficient stoves are valid policy responses, experts agree that these strategies are insufficient to meet the energy demands of Tanzania's growing cities. Similarly, whilst tree plantations[1] offer an alternative supply of wood they are far more expensive to manage than are natural woodlands, and bring their own environmental problems.

Transforming charcoal from problem to opportunity

There is an opportunity to transform and formalize the charcoal sector so that it provides:

- secure employment and increased incomes for rural communities;

[1] TFS Agency estimated that it would cost US$131 million/yr for 27 yrs to plant and manage 185,000ha of additional plantation in Tz, equivalent to US$710/ha/yr. In contrast, a charcoal forest management unit in a village forest reserve costs ~ US$6/ha/yr.

- an incentive to rural communities to maintain areas of natural forest;
- increased tax revenues for village, district and central government(s);
- an incentive for improved governance at the village level;
- better quality charcoal for urban consumers.

Tanzania's woodland can sustain harvesting for charcoal production if guidelines are followed

Miombo woodland is ecologically adapted to withstand disturbance. It has evolved to tolerate disturbance from fire, and even elephants. Research has demonstrated that miombo woodland can be managed for charcoal production in such a way that regeneration occurs rapidly while maintaining the original tree species. It should be emphasized that this model is not applicable in other forest types such as Eastern Arc Mountain or Coastal Forests where disturbance can result in a complete change in vegetation.

The MJUMITA Sustainable Charcoal Model

The MJUMITA Sustainable Charcoal model aims to establish a real-life, pro-poor, sustainable charcoal value chain that provides self-employment opportunities; contributes to investment in community development; and incentivizes more sustainable management of natural woodlands. Since 2012, TFCG and MJUMITA have assisted eight villages in Kilosa District, Morogoro Region to integrate sustainable charcoal production into the management of their village forest reserves.

How does it work?

A first step is for a village to prepare and agree to a village land use plan that includes a village land forest reserve. The reserve needs to be at least a few hundred hectares, and should have some areas of mature woodland in it. In Kilosa the reserves vary from 1,169 ha to 29,571 ha in size.

The community prepares the management plan and by-laws for the village forest reserve. Procedures for doing this are well-established thanks to Tanzania's well-established system of community-based forest management. The management plan designates 'forest management units' (FMUs) as areas for sustainable charcoal production. The number of FMUs varies between villages from one to three depending on the size and distribution of the reserve. In Kilosa, approximately 10% of the area of each village forest reserve is designated for charcoal production. The remaining 90% is for protection, beekeeping and in a few cases selective timber harvesting. Within the 8 pilot villages, the maximum area that can be harvested per year is 257 ha ranging from 11 ha – 79 ha per village.

The rotation period in Kilosa is 24 years. This means that an area harvested in the first year, will only be harvested again after 23 years. Because the rotation period is 24 years, the charcoal Forest Management Unit (FMU) is divided into 24 blocks known as coupes.

Each year, harvesting takes place in one coupe. The yield for that coupe is calculated based on an assessment of available biomass. The sustainable yield from a coupe establishes the annual charcoal quota for the village. The boundaries of the coupe are marked out by the Village Natural Resources Committee (VNRC) and producers are only permitted to produce charcoal within the coupe. Importantly, all other coupes need to be protected in order to allow the woodland to regenerate. This means completely excluding fire for at least the first two years after harvesting. Grazing of livestock is controlled; and agriculture is prohibited. Trees are cut at knee height (~50 cm) leaving behind a stump and the roots. This encourages coppicing.

Preparing an improved basic earth kiln (IBEK) in Kilosa. IBEKs increase the efficiency with which wood is transformed into charcoal.

What is coppicing?

Coppicing is when a tree re-sprouts from a stump. Coppicing is a much quicker way for woodland to regenerate than growing trees from seed. This is because the trees' roots are already established. Many miombo species are well-adapted to coppicing and anywhere from 70 to 100% of harvested stumps will coppice in the type of wet miombo found in parts of Tanzania.

Are all the trees cut down in a coupe?

Not all trees are cut in a coupe. Trees on steep slopes or close to water sources are left, as are timber trees and trees with particular biodiversity values. MJUMITA and TFCG are investigating optimal harvesting strategies that minimize environmental impact whilst promoting rapid growth rates.

How does the permitting system work?

First, a prospective charcoal producer needs to join the village charcoal association. In order to join the association, a producer needs to demonstrate that s/he understands the rules guiding the model including the use of improved basic-earth kilns. The producer then applies to the VNRC to produce an agreed number of bags. Provided that this is within the annual quota for the village, the producer then pays a fee to the VNRC per bag of charcoal to be produced. The VNRC then issues a receipt for the fee; and permits to enter the reserve; and to produce the charcoal. The fee per bag varies between villages from TZS 4,000 to TZS 14,400. The producer then cuts the trees and prepares the kiln within the designated coupe. The VNRC check compliance. Where the village falls in a municipality like Msimba, the municipality collects a fee of TZS 2,000/bag, while for villages outside the municipality, the district collects TZS 1,000/bag.

The producer then removes the charcoal from the reserve and sells it to a consumer or trader. Every transporter needs to get a transit permit from the District. The bag is then accompanied by a transport permit and production license which indicates that it has come from a village forest reserve. This means that the Tanzania Forest Service Agency (TFS) staff can recognize it as being exempt from royalties; and can allow it to pass through the natural resources check-points along the national highway.

The house constructed for the doctor in Ihombwe Village using funds from sustainable charcoal fees.

So far the project has trained over 500 producers to produce charcoal using the improved basic-earth kilns. Of those trained, 419 (44 women and 371 men) have gone on to produce and sell over 1,270 tonnes of legal, sustainable charcoal and have obtained an income of US$ 75,462 from the sale of the charcoal.

The MJUMITA model is supported by local and central government who recognize the validity of the village-issued permits. For example TFS provided the communities with their official permit books, receipts and revenue tracking documents. Similarly Kilosa district forest officers have participated in every stage of piloting the model.

What happens to the money that is paid to the village?

The eight participating villages earned a cumulative revenue of US$ 99,963 between October 2013 and December 2014, from the fees (this is in addition to the income earned by the producers). Decisions about how the revenue to the village is spent are made in village assembly meetings. Some of the money is used to cover the costs of managing the village forest reserve and overseeing the sustainable charcoal model. Costs include patrols and equipment for the patrol teams and VNRC members. For example in Ihombwe village the VNRC have purchased a motorbike and uniforms for the patrol team. The remainder can be invested in community development projects. For example Ihombwe Village constructed a house for the Doctor working in their health clinic; whilst Ihombwe and Ulaya Mbuyuni villages purchased health insurance for all residents of the village.

Members of the patrol team and VNRC in Ihombwe Village