



POLICY SOLUTIONS FOR
SUSTAINABLE CHARCOAL
IN SUB-SAHARAN AFRICA

LET'S TALK ABOUT CHARCOAL

Take note, this is not a scientific document. This is a handbook for anybody in sub-Saharan Africa who wants to make charcoal a more sustainable source of energy. Like other tree-based bioenergy sources, charcoal has the potential to offer opportunities for sustainable green growth and forest management.

The World Future Council has been facilitating knowledge exchange on forest policy in East Africa for several years, bringing together Members of National Parliaments, policy-makers, researchers, international experts, activists and youth. Suggesting charcoal can be a sustainable and modern energy source has always been a hot topic. Charcoal has the negative reputation of being a dirty fuel, 'low-tech', an energy source of the past. A shift in perception is needed to act on political, investment and regulatory interventions.

Charcoal is expected to be a significant part of the energy mix in sub-Saharan Africa for the foreseeable future

Charcoal will not go away – it is expected to be a significant part of the energy mix in sub-Saharan Africa for the foreseeable future. Population growth, urban migration, energy demand for economic growth and the time required for countries to improve their socio-economic conditions to a point when 'modern' cooking technologies can be made affordable for large sections of society means that charcoal will continue to play an important role in the energy mix.

But charcoal is threatening to turn into the biggest driver of deforestation on the continent.

The lack of regulation, investments and coordination along the value chain makes charcoal production and use complex and expensive.

Researchers point out that there is a lack of knowledge about the organisation and governance of the trade and its impact on livelihoods. Policy-makers refer to the inter-linkages between forestry, agriculture, land use, rural / urban development or health. Practitioners point to the challenges in implementation change.

Be this as it may. As activists we say:
We know enough to act now.

By promoting sustainable charcoal, nations will support their communities in generating new jobs, enhancing income generation that in turn helps to create platforms for social development, slow deforestation and integrate climate efforts. For businesses, a sustainable value chain will translate to improved efficiency, lower costs, better working conditions and improved market access. Green growth strategies will need an open and inclusive dialogue between citizens, community leadership, businesses, civil society and authorities. Sustainable charcoal policies will therefore need to promote participation and inclusion.

Greening the charcoal value chain can potentially allow nations to meet their energy commitments for cooking and heating methods in the medium term in a sustainable manner while smoothing the way for a gradual transition to 'modern' cooking technology. Through a holistic approach, charcoal can be made a sustainable and affordable transition fuel. We must begin to talk more about charcoal, not as a fuel on its way out, but rather as a fuel with the potential to transform lives today while protecting our forests.

This handbook is a plea: Let's talk about charcoal. Let's act now.



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WHAT YOU CAN DO NOW

1. Take Charcoal Seriously

Even in a best case scenario, a great proportion of the population in sub-Saharan Africa (SSA) will rely on woodfuels and especially charcoal for decades. Particularly the production of charcoal is a huge and growing threat to forests and biodiversity. Sub-Saharan countries need access to sustainable sources and utilisation technologies of firewood, charcoal, and other biomass fuels on a massive scale, if any natural forests are to survive and health of people addressed.

2. Look at Charcoal in a New Light Charcoal Must Play a Role in a Renewable Energy Strategy

Charcoal is often perceived as a backward energy source – but it can actually play a significant role in a sustainable and future-just 100 per cent renewable strategy that aims at providing access to energy for all. Charcoal is already familiar to a significant percentage of the (urban) population and can provide an ‘energy transition solution’. Consider and promote “green” charcoal and biomass as a modern fuel.

Charcoal Can Play a Role in Modernizing your Country

A recent study has shown that in Malawi, despite the provision of legal channels, to-date there are no recorded cases of legal charcoal production. This means that the livelihoods of an estimated 200,000 people employed by Malawi’s charcoal industry are criminalised.¹ Furthermore, in many countries the charcoal value chain is plagued with corruption.

Tackling corruption and informal structures will benefit society in many other areas. Any formalised production and distribution system can be harnessed for spreading various innovative technology.

3. Tackle your Charcoal Sphere

Don’t be discouraged by the complexity and scope of the problem. Tackle the issue of charcoal in the area you have agency in. This can be a landscape such as a constituency, a district, city or town where you can contribute to making charcoal more sustainable. This will benefit your local people.

Your sphere can also include your technical expertise, your social environment or the institution you work for. On all these levels you can contribute to making the charcoal value chain more professional, just and green.

4. Think Big

Policies can bring change on a large scale. Work on the national level, put biomass and, in particular, charcoal on the national policy agenda. Set up an Inter-Ministerial Steering Committee and a National Charcoal Taskforce.

Don’t stop there: In this handbook you will find examples how international finance can be utilised to green building blocks of the charcoal value chain.

INTRODUCING CHARCOAL

An estimated 90 per cent of SSA's population depend on firewood and charcoal for cooking. Charcoal is biomass based fuel that is a result of incomplete combustion of wood, due to an inadequate supply of oxygen. Apart from being

Energy transitions will take significant time, resources and cultural shift

affordable and easily available, charcoal is lighter in weight, easier to transport, can be stored for long durations, produces relatively less smoke and charcoal fires are easier to manage. There is also a social perspective that food cooked over charcoal is perceived to taste better.

The classical method of charcoal production which is still practiced today in several parts of SSA involves a 'pit kiln process' in which woody biomass is slowly burned in a shallow pit covered with soil. Once cooled the charcoal is bagged and transported to urban centres through a network of intermediaries and eventually sold to the final consumers. This constitutes the 'charcoal value chain'.

Charcoal Will Continue to Play an Important Role in the Energy Mix

In their aspirations for socio-economic growth, several governments in SSA seek to make 'modern' cooking technologies accessible to their people. However, such energy transitions will take significant time, resources and cultural shift. The 2009 Malawi Biomass Energy Strategy proposes that even the most optimistic roll out of electrification would still leave the country 82 per cent dependent on biomass in 2020 and that with population increasing the charcoal market will double by 2023. ²

Policy developers need to ensure that in the course of restructuring economy, a sudden 'high technology fix' does not leave a dramatic impact on society. In trying to promote gas stoves, for example, without assuring supply and price of cooking gas while banning charcoal can be disastrous not only for society but also for the implementing governments. Transitions need to take into account social and economic aspects, gradually building acceptance for the new technology, while improving the economic conditions to make 'modern' technologies affordable and available. Therefore, in the short and medium term, charcoal, a fuel source already familiar to a significant percentage of the (urban) population can provide an 'energy transition solution'.

Challenges Caused by Charcoal are Exacerbated by Urban Growth

Africa's urban population has been growing very rapidly averaging almost 5 per cent per year over the past two decades. Climate change, food insecurity and the lack of income generating opportunities in rural areas are primary causes for urbanisation. The numbers of new urban residents are projected to rise sharply by over 300 million between 2000 and 2030, more than twice the rural population increment.

A study in Dar es Salaam found that a 1 per cent increase in urbanisation can lead to an increase of up to 14 per cent in charcoal consumption. This multiplier effect kicks in because urbanisation leads to smaller household sizes, more frequent cooking activities, and significantly increased consumption by businesses and public

'Modern' Cooking Technology

While the popular perception of 'modern' cooking technology indicates the increased use of fossil fuels such as cooking gas or even kerosene, here we use the term much broader. Electricity produced through renewable sources is both environmentally sustainable and easy to handle for cooking.

Modern technology can also include high efficiency cookstoves operating on locally available sustainable biomass. Notably the gasification of sustainable biomass and waste provide advantages similar to that of fossil fuel based cooking gas without dependency on imports and associated environmental degradation.

facilities, such as small restaurants, hospitals, and schools. Charcoal is also used for brick burning.³ This increased charcoal consumption by urban dwellers leads to a vicious cycle: In many rural areas forests are a source of wealth and subsistence. Reduced forest cover leads to a loss of income which in turn exerts pressure on rural-urban migration which again causes a higher demand for charcoal.

Charcoal Production is a Driver of Deforestation

The use of woodfuels does not necessarily cause deforestation. The links between people, woodfuels and forests are complex, including a range of spatial, institutional, social, and ecological influences. The

collection of fuelwood for direct combustion, a daily or periodic task mainly undertaken by women and children, may

not cause deforestation under certain conditions. There is, however, irrefutable evidence that the production of charcoal is a major driver of deforestation in SSA. ICRAF scientists amongst others have repeatedly stressed the role of charcoal in the systematic degradation of forests.⁴ A recent study from Zambia concludes that charcoal production is the direct and major contributor to forest loss under current trends and behavioural assumptions.⁵

A 1% rise in urbanisation can increase charcoal consumption by 14%

The Whole Charcoal Value Chain Needs to be Tackled Simultaneously

This will require collaboration between public and private actors, an understanding of what value means to the different stakeholders and a consideration for their needs, practices and attitudes. A supply chain is a system involving people, activities, information, resources and entities that move goods or services from the supplier to the consumer. A supply chain delivers value – economic value, enhanced experience and improved social development by delivering a product or service to the market.

The charcoal value chain may appear basic but is a sophisticated supply chain that operates similar to a conventional goods/services industry and transforms natural resources (biomass) into a finished product (charcoal) that in turn provides energy for heating (service) to the end-users. The ‘value’ delivered by charcoal is at three levels: at a primary level charcoal provides energy for cooking and heating; at a secondary level it brings economic value to its various participants in the value chain; and at a tertiary level, the value is created in terms of support of the socio-economic development of the society at large.

Thus the positive impacts of a sustainable charcoal value chain go beyond affecting the direct users but extend to include a much larger group of stakeholders. A fragmented approach in tackling the value chain can only lead to marginal improvement. To be truly sustainable, components of value chains need to be tackled simultaneously.

Stacking, not Climbing:

Household Energy Decisions

Step by step from firewood, to charcoal, to kerosene, to electricity: The ‘energy ladder’ concept assumes that households abandon traditional forms of energy and take a step up the energy ladder as their income rises. Studies, however, have found that decisions in SSA do not follow this linear path: households switch between fuels and even use fuels from different categories at the same time.

Reasons for this include the risks inherent in shifting from a tried-and-tested energy source to a newer fuel, combined with the uncertainty of income streams.⁶ A recent study in Zimbabwe found that firewood is the most popular alternative energy source in the absence of electricity, a reason being that the supply of ‘modern’ fuels, especially electricity, is erratic, forcing consumers to revert to the use of traditional fuels at least on a stand-by basis.⁷



EXPECTED IMPACTS OF A SUSTAINABLE AND FORMALIZED VALUE CHAIN

Benefits for some of the poorest and least educated groups of society

If charcoal is managed sustainably, production could serve as a long-term income source, especially for the rural poor.



Fairer profit distribution

The value chain provides a significant amount of jobs at each step. Charcoal production activities employ the largest group of people but the proportional income generation is biased in favour of 'middlemen' or large-scale producers who control the trade. Similarly transportation and distribution of charcoal provides employment to truck drivers and charcoal retailers who are comparatively better off than their rural counterparts, but are susceptible to bargaining. Competition forces them to operate on small margins.

Many private sector actors with increased income

The use of efficient kilns and improved cook-stoves will provide stakeholders with additional free time. This time can then be used for other income generating activities.

Social development

Health (especially maternity and child health), women's empowerment, gender equality, education, sanitation – all these issues have a direct correlation to improvements made in the charcoal value chain. In rural Africa, the collection of firewood is mainly undertaken by women and children which can be both, time consuming and physically exhausting. Improved access to charcoal can allow women to spend time on gainful economic activity which can be provided by the charcoal industry itself.



Capacity building

Training of charcoal workers will lead to development of several skill sets within the community such as operation and maintenance of equipment, understanding business models, pricing strategy etc. – which in turn will lead to increasing the profile and demand for improved education for adults and children.



Positive impacts on climate action

Reduction in biomass consumption and improved forest management will enable forests to play their role as a carbon sink. Similarly, efficient kilns and cookstoves will lead to lower emissions allowing countries in SSA to play their role in tackling climate change, whilst benefiting from a renewable source of cooking fuel. Positive actions will provide SSA countries with a better political leverage at global negotiations. While indicating their willingness to change and their ability to implement, governments can also negotiate for additional funding required for greening of other sectors of their economy.

A reduced deforestation rate

Deforestation and forest degradation, as well as the associated degradation of air, water and soils are cited as the principal environmental challenges of unsustainable charcoal production. In fact, one of the key ‘sustainable’ aspects of greening the value chain is to ensure that the net deforestation rates are at minimum to zero (i.e. ensure the quantity of wood harvested for charcoal production annually is regenerated at a rate that is equal or more). Focus on forestry activities will improve the understanding of forest conservation of rural communities.

Revenue from permits and taxes

Sustainable charcoal can be legal charcoal on which taxes and levies can be paid. Local, district, and national governments will profit.



Broad support for government

An inclusive approach to tackling the value chain will ensure that its current ‘villains’ do not lose out but are given alternative opportunities to continue operating under a legal framework. This can be a way to ensure that there is support for the policies from all sections of the society.

PLANTING NEW IDEAS

The Green Belt Movement promotes the planting of indigenous bamboo in Kenya for its conservation value and economic benefit, including its potential to serve as a fuel. In a pilot project we are engaging tree nursery groups in Maragua constituency, Murang'a County, who have grown more than 1400 seedlings to date. Agriculture, in the form of small-scale food and cash-crop production, is the major economic activity in the constituency, accounting for 70 per cent of income. Women provide 80 per cent of family labour and produce 60 per cent of farm-derived income in the district, but most do not own land in their own name and access it through male relatives – husbands, brothers, fathers or sons. The area has experienced fast population growth which has resulted in land fragmentation to small strips not conducive to economic activity, hence alternative sources of income are vital.

Growing the bamboo was the obvious first step. Plants need to be watered during dry months until rooted properly and weeds must be controlled until the bamboo is properly established and can compete with weeds and other



bushes. Community enthusiasm has been greatly enhanced with the construction of a sanitary facility made of bamboo material that was sourced locally.

With our partners we conducted a training workshop to empower local women with entrepreneurship skills to create bamboo products. The trainees were able to learn how to make innovative bamboo products for local market segments and how to market such items. These items include smashing sticks (mwiko), kitchen utensil holders, scooping spoons, dinner spoons, and tea spoons, sugar dishes and even a small shelter.

We know that the bamboo can also provide biomass for briquetting and once we have grown enough we will teach the women how to make high quality briquettes. We generally include the issue of cooking in our outreach work. For example, we have introduced improved cookstoves which use less biomass compared to the traditional ways of cooking. Furthermore, we are sensitising local women on ventilation in their kitchen to address health issues of indoor air pollution.

Our experience shows that engagement at the grassroots level is crucial for the introduction of new ideas and sustainability of projects. When the communities understand the linkage between their actions, environment and their livelihood situations they are more likely to muster their energies and take action for change.

The Green Belt Movement was started in 1977 by the late Professor Wangari Maathai. What began as a grassroots tree planting program to address the challenges of deforestation, soil erosion and lack of water is now a vehicle for empowering women and communities. Its mission is to strive for better environmental management, community empowerment, and livelihood improvement using tree-planting as an entry point. We have an extensive grassroots network that mobilizes communities around local development activities. To date, the Green Belt Movement has facilitated the formation and sustenance of over 4,000 community groups, of which 70 per cent are women.

Aisha Karanja
Executive Director
The Green Belt Movement



CONSIDER: PEOPLE

Stakeholders in the Value Chain

The charcoal value chain consists of several stakeholders, both rural and urban, involving individuals and communities, operating legally or in informal groups or as ‘charcoal cartels’, with different levels of engagement. While the ‘producers’ are responsible for charcoal

On the demand-side of the charcoal value chain are not only the consumers of charcoal but also manufacturers and related stakeholders of efficient cookstoves. This latter group has gained significant publicity due to several large programmes initiated under carbon trading schemes (e.g. UNFCCC CDM or voluntary schemes).

The inter-relationship between the various stakeholder groups (e.g. producers, transporters etc.) is complex with overlaps between roles (e.g. a producer may also transport charcoal) and linkages (e.g. a transporter may sell to a wholesaler or directly to a consumer).

Incentives

To date, charcoal stakeholders have few incentives to comply with regulations but face a significant number of compliance disincentives such as the cost of obtaining a permit, the time spent preparing information for a permit, time spent traveling to administrative offices to request permits, etc.

Moreover, actors are not assured that obtaining an official permit will result in lower ‘unofficial tax’ levied along the road as many officials do not have the desire to stop this profitable practice. Corruption is also present in other steps of the value chain thus hindering adequate governance and enforcement.

Stakeholders have few incentives to comply with regulations

production, the raw material is sourced from ‘woodlot stakeholders’ who are typically owners of the private forest lands. The ‘rural stakeholders’ extend beyond the direct participants of the charcoal trade to include community leaders and village governance institutions.

The ‘transporters’ and ‘wholesalers’ of charcoal are the weak link in developing a sustainable value chain. Transformation will require ground level staff (both existing and new) to be better equipped and trained to ensure policy implementation.

CONSIDER: GOVERNANCE

Importance

Cooking energy finds relatively low attention in several national energy policies, with the bulk of the focus on electricity production and the use of fossil fuels. Consequently, States are not benefiting from what would be one of the most important sectors in a large number of SSA countries. ⁸The first step is acceptance of the significance of charcoal in the energz mix.

Inter-linkages

The key challenge in developing a policy framework for sustainable charcoal is that it is a cross-cutting issue linked to multiple sectors and ministries including forestry, energy, agriculture, land use, health, social development, transport, and rural/urban development. Hence developing a sustainable charcoal policy requires cross-sector collaboration and communication between the regulatory agencies.

Informality

One of the key characteristics of the charcoal value chain is its informal nature. Although certain countries have experimented with legalising the system, for most part the trade remains informal, illegal and under-valued as a commodity. This is a result of a number of issues such as lack of comprehensive consistent policies and regulatory institutions. A further challenge in developing charcoal policies is therefore to facilitate its transformation into a formal sector.

Implementation

While countries have shown the willingness and ability to develop policies at a national level, they have been found lacking in executing the programmes and actions especially at district/ regional level. Parallel to establishing and harmonising charcoal policies, countries need to work towards simplifying the administrative structure, organising the charcoal trade by setting up a transparent and differentiated revenue collection system and ensuring that institutional capacity at local/district levels are strengthened.

CONSIDER: LANDSCAPES

Experience shows that in many cases a concentrated, sectorial approach to tackle issues such as food production, poverty alleviation or conservation is not showing the desired results. It is time for a new perspective.

An alternative approach already exists. It has been developed to break up current silos such as agriculture, forestry, fisheries or conservation and is called the 'landscape approach'. The idea is to balance competing demands for multiple land uses within a given area. This involves 'joined-up' thinking between multiple stakeholders and integrating policy and practice for multiple land uses within this landscape.⁹

While this new form of management does not come with a concrete policy plan at this stage, it does provide interesting perspectives to tackle the issue of charcoal. Some ideas:

Map Inter-Linkages

Start by mapping the inter-linkages of energy use, land use, and social development in regards to charcoal in a certain landscape. This will provide a much clearer picture on stakeholders, profit distribution, risks and chances.

Build Institutions

Implementation of regulations and institution building on a district and local level is a key challenge in tackling the charcoal value chain. Priority could be given to building institutions within a certain landscape such as a designated producer area.

Who Thinks in Landscapes?

Some people have specific interest to act on a landscape level: Members of Parliament, Senators, and Members of National Councils are custodians of their constituency - which can qualify as a 'landscape' They should naturally apply integrated landscape thinking and help balance competing demands.

REPORT FROM KYANKWANZI



My constituency is one of the areas in Uganda most affected by climate change. During the rainy season we experience floods and heavy storms. In 2014, three bridges were washed away. Heavy storms destroyed houses and gardens, animals drowned. Churches were damaged and a large number of schools de-roofed.

Kyankwanzi constituency is one of the largest suppliers of charcoal to Kampala. Land is being cleared for farming and ranches. Trees are being cut and made into charcoal. There has been damage through bush fires, some of which have been started by local communities.

We have three Central Forest Reserves in Kyankwanzi. The National Tree Planting Act demands for 5 per cent of the land to be reserved for the communities living around the forests. However, communities had not been involved or allocated the percentage they are entitled to.

Communities surrounding the Central Forest Reserves have now formed Associations to conserve the forests. I am currently in negotiations with the National Forest Authority (NFA). To date, three associations have signed memorandums with NFA for Collaborative Forest Management and areas to plant trees have also been allocated. This will reduce destruction.

For Women's Day celebrations in May 2015 we included a day to plant trees, including fruit trees. In all the 400 villages that make up the district, women headed the tree planting. The Parish Women Councillors took over supervision. We managed to source 40,000 tree seedlings from the NFA and communities contributed further. Every woman in every village was required to plant at least 10 trees. We planted over 500,000 trees on that day.

Nankabirwa Ann Maria (MP)
Kyankwanzi District
Parliament of Uganda

POLICY IMPLEMENTATION IN RWANDA

Rwanda's National Forest Policy, initiated in 2004 and updated in 2010, was awarded with the gold Future Policy Award by the World Future Council in 2011. The Future Policy Award celebrates policies with particularly positive effects on the living conditions of current and future generations. The aim of the award is to raise awareness for these exemplary policies and spread them.

Rwanda is one of the very few countries in SSA which has successfully increased its forested area.¹⁰ The East African country has not only succeeded in stopping deforestation, it has actually managed to reverse the process and, since 1990, the proportion of forested area has increased by 37 per cent.

What makes the Rwandan forest policy successful?

The Future Policy Award evaluation process showed that the policy connects a range of diverse measures, including some not directly associated with forestry. Guiding principles include sustainable forest management, stakeholder involvement in decision making, development of agroforestry, nurturing of fragile ecological zones, reduction of negative ecological impacts of man-made forests, protection of endangered plant species and education on forestry issues. One reason why the policy is successful is that it addresses cross-sectoral challenges.

What makes the policy work on the ground?

Experts and practitioners often state that many African forest policies face challenges of implementation, such as administrative obstacles, weak law enforcement, lack of monetary incentives and lack of equitable distribution of benefits and costs. The Future Policy Award evaluation showed that key success factors of the implementation of the Rwandan forest policy included a strong political will, structured governance and robust institutions with sufficient budgets also on the local and district level. Reforestation is an environmental priority of Rwanda, as well as forest related topics such as preservation of biological diversity and climate change mitigation and adaptation.¹¹ Furthermore, the government has set a clear, measurable target in terms of increased forest cover. Its objective is to increase national forests to 30 per cent of the national land area by the year 2020. The aim for agroforestry systems is 85 per cent of agricultural lands. The area of new forests to be created is specified in hectares annually.¹²

Crucially, this explicit political target was followed by the organisation of strong institutions with sufficient budgets, on national as well as local level. In several African countries, the absence of strong institutional structures at the local level has led to domination by small elite groups.¹³ In Rwanda, the National Forestry Authority was established in 2008 to promote transparent, prompt and effective implementation of the forestry policy provisions. Moreover, many stakeholders are involved in the implementation at different levels. Rwanda is divided into five provinces containing 30 districts and 416 sectors. The sectors which are again divided into cells. Forest officers are working at district levels and cells have to prepare tree nurseries for their areas. The community itself is also involved.

The forestry sector in Rwanda is benefiting from a strong institutional environment in general. But the reverse is also true: a forest policy that provides for local benefits and responsibilities can be a key driver in developing decentralised institutions. Furthermore, lessons from Rwanda show that sufficient budgets, educated staff, and anti-corruption measures are instrumental to achieving implementation of policy on the ground.



THE CHARCOAL VALUE CHAIN

This handbook classifies the charcoal value chain broadly into four sets of activities. It analyses each category by breaking it down to two 'building blocks'. Policy objectives, recommendations for action as well as financing options are listed.

Building Blocks

Procurement



Sourcing Wood

Covers the significance of African forests and trees, enabling conditions for community-based forest management

Charcoal Producers

Explains the different situations of charcoal producers and their common characteristics

Carbonisation



Charcoal Kilns

Relates to combustion of woody biomass in kilns and issues of energy efficient production

Charcoal Briquettes

Briquettes can provide an ideal test case to kick start the sustainable value chain

Logistics



Transportation of Charcoal

Looks at the physical movement of charcoal from producers to consumers

Wholesale and Distribution

The least understood and most challenging aspects of building a sustainable charcoal value chain

Demand Side



Marketing Charcoal

Charcoal consumption, eco-labels, customer sensitisation

Charcoal Cookstoves

Government actions need to support market creation and expansion of efficient cookstoves

CHARCOAL ECONOMICS IN KENYA

The 2005 National Charcoal Survey study estimates that Kenya has 200,000 charcoal producers accounting for 40 per cent of half a million people directly involved in the charcoal trade, who support 2.5 million dependents.

About 1.6 million tonnes of charcoal are produced annually which translates to USD 400 million annually at current market prices. By 2013, the number of charcoal producers had gone up 25 per cent and stood at 253,808 producing 2.5 million tonnes indicating a significant increase in the 5 year period. The study commissioned by Kenya Forest Service

transporting 900 bags/month and USD 547 for wholesalers dealing with 200 bags/month and USD 143 for retailers based on 16 bags/month. The charcoal producer therefore benefits least in the value chain due to lack of market structures, ineffective implementation of laws and high levels of corruption. Most of the woody biomass is obtained from trees owned by producer's farms (44%), private lands (38%), government land (13%) and communal land (5%). However, on average, more trees were removed from government forests in those districts that had protected forests.

The average cost of a mature, whole tree to a charcoal producer is USD 6.50, frequently obtained for 'free' in return for labour, in particular when forest lands were cleared for agriculture. Over 90 per cent of charcoal producers used inefficient, traditional earth kilns with recovery rates of as low as 10 per cent (i.e. 1 kg of charcoal for every 10 kg of wood burned).

Source: Ministry of Environment, Water and Natural Resources Kenya (2013): Analysis of the Charcoal Value Chain in Kenya, Nairobi.

Available at: www.kenyaforestservice.org/documents/redd/Charcoal%20Value%20Chain%20Analysis.pdf

In the value chain the charcoal producer benefits least

estimates the value of charcoal trade stood at USD 1.6 billion in 2013, an almost 400 per cent increase in value.

In 2013, an average producer dealing with 30 bags of charcoal earned USD 95 per month as compared to USD 2,150 for transporters

PROCUREMENT



Building Block 1: Sourcing Wood

Burning Forests for Charcoal

The choice of hardwood or softwood trees from Africa's forests determines the quality and yield of charcoal when carbonised. While there are preferences for certain dry slow growing species (e.g. Acacia), the forest targeted for charcoal production is dependent on several factors including its proximity to roads, the financial needs of the forest owner (e.g. urgency of money for hospitalisation or marriage), enforcement level of forest protection etc. As most of the

charcoal producers operate clandestinely, there is no reliable information about the volume or rate of extraction.

Several countries have various policies addressing forest management, rights for wood extraction and permitting processes. While some of these may not be comprehensive, the real challenge is weak enforcement of policies coupled with lack of trained manpower and insufficient budgets.

Participatory Forest Management

There is evidence that certain policy measures and regulations enhance a more sustainable use of forests and trees: Many studies have shown that forests under communal management tend to have better forest cover than those without. It is widely believed that decentralising management of natural resources can increase both efficiency and equity.¹⁴ There are different Participatory Forest Management (PFM) approaches such as Community Based Forest Management (CBFM), Joint Forest Management

(JFM) or Collaborative Forest Management (CFM). All of these approaches devolve rights and responsibilities to manage forest resources to local communities in close proximity to forests.

While PFM in many cases improves forest status, local people do not necessarily perceive it to contribute to their livelihoods, reasons include: insufficient benefits generated, inequality in the distribution of these benefits and limited involvement in key management decisions.¹⁵

ENABLING CONDITIONS FOR COMMUNITY-BASED FOREST MANAGEMENT

The FAO Africa Office has published ‘Guidelines for Institutionalizing and Implementing Community-Based Forest Management in Sub-Saharan Africa’¹⁶ which identify a range of enabling conditions for the promotion of community-based forest management:

- A discrete and defined community with identifiable membership is essential to enable smooth decision-making and cost and benefit sharing.
- The existence of legitimate and respected local community institutions that can facilitate dialogue and provide platforms for engaging with other stakeholders is important.
- The forest area over which the community has jurisdiction should be clearly defined with identifiable boundaries.
- The forest to be managed should be part of a land use plan that sets aside the forest in relation to other land uses such as agriculture. This provides a framework for long term investment.
- Clear tenurial rights are crucial to enable the community to negotiate with government for exclusive use of forest resources and for investment as well as revenue sharing.
- Local communities must become recipients of genuine benefits from all forest-based economic activities including the most lucrative such as timber and tourism.
- CBFM is more likely to succeed where forest products have good access to reliable markets. The limited access to markets and credit needs to be addressed; low levels of literacy and poor technologies resulting in inferior products have to be overcome.
- The availability of financial resources is critical for investment in forest management activities, capacity building and establishment and operation of small forest-based enterprises.
- Local community members and local community institutions need to have adequate capacity to execute their mandates and responsibilities. This will require training, external support and above all an opportunity for the community to “learn-by-doing”. As roles change from policing to facilitation, public forest institutions will need to develop new capacities and equip their staff with new skills and knowledge to enable them to better engage and support CBFM.
- The knowledge base should be improved. Research should be an integral part of CBFM activities.
- Development and implementation of CBFM requires long term investment and nurturing before its full benefits can be realised. A long term view to provision of assistance from donors, NGOs, forest departments and private sector should be considered for any such intervention.
- All members of the community, including different user groups, and other stakeholders (e.g. private sector, local government state agencies) need to be involved in all aspects from planning to monitoring to ensure their needs and interests are taken into account. Genuine agreement on the principles and objectives of forest resource management is a prerequisite for effective community based forest management.
- A step-wise approach gives all concerned time to learn and adapt to changes as well as to build confidence between the communities and the state and other partners.



Species: *Lonchocarpus capassa*
Local Name: Mpakasa / Mwaswa
Uses: for bundles / charcoal

THE SIGNIFICANCE OF AFRICAN FORESTS AND TREES

Africa has vast areas under forests and tree resources. More than anything else, these resources are at the centre of the socio-economic development and environmental protection of the continent. Life on the continent is largely shaped by these resources; their availability and quality. African forests and trees are renowned for their habitats for wildlife, beekeeping, unique

natural ecosystems and genetic resources. They are catchment to many rivers and harbour many river basins that are cornerstones of economic development on the continent.

Forests underpin
key sectors of the
economy of many
African countries

The overwhelming majority of Africans obtain their energy needs from forests and trees, mostly as woodfuel. Furthermore, the natural forest resources are increasingly receiving global attention because of their share in biological

diversity, potential for industrial timber exports, capacity for mitigating global climate change, livelihoods 'safety nets', and as levers for rural development. African forests and trees also offer some unique opportunities for rural communities to adapt to the adverse effects of climate change.

In short, African forests and trees underpin key sectors of the economies of many African countries, providing the bulk of energy needs, supporting crop and livestock agriculture, wildlife and tourism, water resources and livelihoods.



Professor Godwin Kowero,
Executive Secretary, African Forest Forum

cited from Kowero, G.: Climate Change and African Forests and Trees: The Stakes are Enormous, in Chidumay E. et al (2011). Climate Change and African Forest and Wildlife Resources, Nairobi

Building Block 2: Charcoal Producers

Charcoal production in SSA is undertaken mainly by the rural poor. These producers can be broadly classified into three major groups:

The Independent Producers are “professionals” for whom charcoal production is the primary source of income. They operate in small groups and are mobile, moving from one woodlot to another once the raw material in a particular area is used up. The independent producers seek out forest owners and negotiate a lump sum price based on density, acreage, distance from roads and type of trees. They have some bargaining power with regards to selling price as they may directly bear the responsibility of transporting charcoal to urban areas (e.g. on bicycles) or have an agreement with charcoal transporters for a set number of bags and price.

The Seasonal Producers are ‘semi-professionals’, typically subsistence based farmers who pursue charcoal production to generate income during the non-agricultural season. They operate in small groups and their area of operation is limited (i.e. seasonal producers may not venture too far away from their villages). They have very little bargaining power with setting the selling price of charcoal and often negotiate on-spot prices with road-side transporters.

The Employed Producers are ‘salaried charcoal workers’ who operate as part of a large charcoal producer – either licensed entities (e.g. for export) or as part of unauthorised ‘charcoal cartels’. They operate in relatively large groups of people, are more organised and therefore more

efficient. They are relatively better paid than the previous two categories and typically move to forested areas which offer larger volumes of raw material. This makes these paid workers relatively less mobile than the independent producer but causes higher deforestation in terms of acreage.

Characteristics of Charcoal Producers

Income Discrepancy: As with any value chain, the charcoal producers represent one section of stakeholders involved in the charcoal trade. Although they initiate the supply side of charcoal, they exert no direct control on the charcoal trade, which is driven by middlemen, wholesalers and transporters. This lack of bargaining power, combined with the unorganised nature of their activity, causes maximum damage to the environment. The efforts put into sourcing of raw material and the labour are not reflected in the income generated.

Accessibility: The average producer may not be literate and have very few skills required in undertaking gainful employment in a trade apart from those involving manual labour. The producers operate in groups of four to ten people and usually belong to one tribe or community. While the salaried workers operate under the directives of their employers, the seasonal producers as resident members of a village are answerable to traditional leaderships. The most difficult group to access are the independent charcoal producers who lead a nomadic lifestyle with information being exchanged through word of mouth and informal networks.

Procurement: Policy Objectives

- Aim for zero charcoal from natural forests.
- Build capacity and institutions and provide budgets to implement policies, regulations, permits.
- Put in place a sustainable woodlot management programme that is made accessible to the charcoal producers through training and capacity building.
- Create a market link between rural suppliers and urban consumers.
- Reach out to charcoal producers by using existing social structures.
- Establish a mechanism for collective bargaining through cooperatives.
- Facilitate finance.



Procurement: Policy Recommendations

Fill Information Gaps

Define Forest: A consistent national forest definition needs to be established. This definition should include details about the minimum tree crown cover, minimum land area and minimum tree height needed to comprise a forest. Next, a thorough forest inventory needs to be completed which should clearly define the area of forests of all types in the country. This inventory will then serve as the baseline for all future forest activities in the country.

Waste and Residue: Information about the amount, type and location of wood waste and agricultural residues is necessary in order to plan for briquette production. This information can be acquired through local surveys of various waste producers in various districts, the timber industry and extrapolations.

Population and Employment: While most nations undertake census and gather statistics regarding urban/rural population, employment, gender, etc., the data needs to be reviewed from a charcoal perspective to enable countries to get a better picture on the number of people employed directly or indirectly with the charcoal trade.

Reach Out

Build Capacity for sustainable woodlot management for charcoal producer associations as well as government agencies and private actors. At a national level, a Charcoal Taskforce can support the development of training material and support training of trainers (e.g. senior forest officials) following which the senior staff can then hold trainings at a local level. The training will include aspects such as seedling, nursery, and forest management. Following the trainings, the trainers should be available to assist regularly. Private sector trainers can provide follow-up as part of their training package.

Secure Buy-in of Community Leaders: Being sensitive of social and communal set-up of rural SSA and the influence of village elders, the governments need to reach out to local community leaders and village elders to promote the concept of sustainable woodlot management. The community leaders once convinced about the long term economic and environmental sustainability of sustainable woodlots can help reach out to the other members of the community and secure their commitment. Although it will not succeed in reaching all the independent charcoal producers, this offers a viable option to connect with stakeholders who are often hard to access and highly mobile.

Establish Cooperatives: Reaching out to charcoal producers will require innovative solutions that take into account the existing social structures to gradually build confidence to a point where they can see long term value in sustainable practices. Establishing a ‘Charcoal Producers Cooperative’ or association can be a solution to overcome some challenges in tackling this particular group of stakeholders. Cooperatives or associations can be formally registered, licensed and act as a supporting agent for the subsequent data collection process crucial for international donor finance. Once registered, the government can then proceed to sign formal agreements with these cooperatives and support the development of woodlot plans highlighting the kind of support to be expected and in return ensure that illegal deforestation practices are discouraged.

License Renewal and Verification: The government needs to put in place a system where the license of charcoal producers’ cooperatives is renewed on an annual or periodic basis. The purpose of renewal is to ensure that representatives from government or supporting agencies periodically reach out to the charcoal workers to collect feedback, ensure that sustainable activities are carried out as planned and gather first hand data on socio-economic-environmental impacts. This information can be fed back into the system to support improvements in the policy and help plan future course of actions.

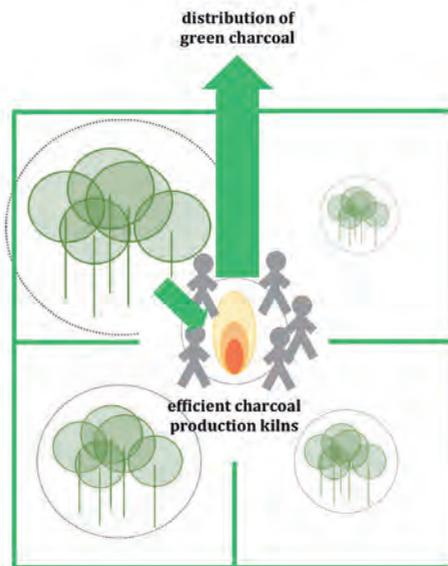
Establish Policies and Planning

Sustainable Woodlot Management Plan: Improved woodlot management can help to increase productivity of forests, providing more cubic meters of wood per hectare. Planning can lay the foundation for improving the overall effectiveness of woodlot activities and assist in reducing costs. It can help charcoal producers cooperatives obtain licenses, receive assistance and implement resources effectively.

Participatory Forest Management: Create enabling conditions, include local actors.

Establish a Forest Code: This type of a document may exist in several countries in several forms. The premise of a Forest Code is a document which is reflective of a country’s current forestry situation and covers issues such as definition of forest, the type and coverage of each forest, the rules and regulations, and the rights of stakeholders. More importantly, it should expand to include plans and procedures for sustainable forestry, how they can be incentivised and promoted as well as a clear set of rules for appropriate punishments for any violations.

Model Solution: FSFF



The FSFF (Fast Start Forest Finance) model solution consists of a general out-reach and community buy-in program but focuses around literally developing a sustainable woodlot management cycle around an efficient charcoal kiln. Given the challenges of transporting biomass over large distances, the model proposes the establishment of an industrial scale charcoal kiln centred around 4 to 6 plots reserved for woodlots.

In year 1, the seedling management programme is carried out in plot 1, in year 2 the seedlings planted in plot 2, and so on. The acreage of woodlots planted should be equivalent to the quantity of wood that can be burned in the charcoal kiln over a one year period to produce quality charcoal and the choice of seedling can

be a local fast growing variety of tree(s) that can be ready for harvest in 4 to 6 years. By 4th (or 6th) year, the charcoal producers harvest the mature trees planted in year 1 and plant new seedlings thus continuing the cycle.

The government will need to ensure that the charcoal producers are provided with a sustainable income over the initial 4 to 6 years and the FSFF can source finance on a 'payment against performance' basis. While the payment helps to ensure that the charcoal producers are deterred from using unsustainable practices, the opportunity for income enhancement and employment over an extended period of time will also reduce the pressure on urban migration and the corresponding demand for charcoal.

Procurement: Financing Options

The Forest Investment Program (FIP) is a targeted programme of the Strategic Climate Fund, which is one of two funds within the framework of World Bank's Climate Investment Funds. The FIP currently supports Ghana, Burkina Faso and Democratic Republic of Congo among other developing countries to reduce deforestation and forest degradation and promote sustainable forest management that leads to emissions reductions and enhancement of forest carbon stocks (REDD+).

Channelled through the Multilateral Development Banks (MDBs) as grants and near-zero interest credits, the FIP is a USD 640 Million (pledged) fund and the financing complements large-scale investments and leverages additional resources such as the Forest Carbon Partnership Facility (FCPF), the Global Environment Fund (GEF) and the UN Collaborative Program on Reducing Emissions

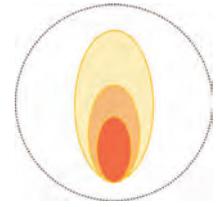
from Deforestation and Forest Degradation in Developing Countries, including from the private sector, to:

- Promote forest mitigation efforts, including protection of forest ecosystem services,
- Provide support outside the forest sector to reduce pressure on forests,
- Help countries strengthen institutional capacity, forest governance, and knowledge,
- Mainstream climate resilience considerations and contribute to biodiversity conservation, protection of the rights of indigenous peoples and local communities, and poverty reduction through rural livelihoods enhancements.

The FIP and the other sources of forest related finance mentioned above can be ideal source of finance for the 'Fast Start Forest Finance' solution (see below) and other finance required to kick-start sustainable woodlot management programmes in SSA.



CARBONISATION



Building Block 3: Charcoal Kilns

Traditional Earth Mound Kiln

The most common type of kilns used in SSA is the 'traditional earth mound kiln' and the technique has remained unchanged for generations. The process involves stacking of wood over a shallow pit and covering it using a combination of wet grass and mud.

The expertise lies in partial burning of wood and allowing for incomplete combustion by restricting supply in the wood pile.

The traditional kiln has three key advantages that need to be taken into account when proposing alternative solutions:

Zero-Cost: Requires no capital investment or special tools to build.

Portability: Can be built on an open piece of land near woodlots. This allows minimum effort from charcoal producers for transportation of wood for carbonisation.

Operation: Requires no specialised technical knowledge or equipment to operate and minimum oversight.

SEEING IS BELIEVING: CREATE A MODEL SOLUTION

The challenge of establishing an industrial scale charcoal production around the use of efficient kilns is to help charcoal producers understand the financial viability in efficient charcoal production techniques. Although there exists technical knowledge in SSA, albeit scattered, on the use of several types of efficient kilns, the socio-economic characteristics (e.g. cost of kiln, manpower and skills required to operate the kiln, etc.) needs to be demonstrated to rural communities as a working example in a familiar context (e.g. using biomass familiar to charcoal producers and operated by people of similar socio-economic background to build a connection). As part of the community buy-in program, it is essential that the community leaders and producers are invited to view and experience first-hand working examples of efficient kilns established by the government at certain locations around the country. These demonstration projects should discuss business models along with concerns that are sensitive to the local context such as forest ownership issues. A similar demonstration project can be established for charcoal briquetting with the use of locally available agricultural residues.

Efficient Charcoal Kilns

This term refers to improvements made over traditional earth kilns either through the addition of a chimney (also known as improved earth kilns) or kilns made using bricks/earth or steel/metal designed with the aim of improving the efficiency of charcoal production.

Improved Earth Kiln

The improved earth kiln offers better carbonisation resulting in higher yield (about 25-30 per cent compared to 20-25 per cent of traditional kilns) and a better quality of charcoal. Efficiency improvements can be brought about by preparation of the fuelwood prior to carbonization. Typically wood is cut to appropriate sizes for optimum stacking and allowed to dry for a period of 8-10 days to reduce moisture content. Wood is stacked as tightly as possible with smaller pieces of wood fit into gaps to allow for better heat transfer.

The key 'technological advancement' is the introduction of a chimney, made from metal (e.g. oil drums) and fit at the opposite end from the point where the stack is lit thus ensuring equal distribution of heat through the stack. The stack is covered with a thick layer of vegetation and earth to prevent complete combustion (due to air leakage).

Brick / Earth Kilns

These kilns can be rectangular, dome shaped with varying dimensions and design. They are ideal for producing high quality charcoal in large quantities and at higher efficiency (30-35 per cent), and are best suited for charcoal production

at an industrial scale. The kilns are more robust in construction than traditional earth kilns, can be operated all year round and are less susceptible to poor operator practices.

Brick kilns are expensive to build and require specialized skill in brick making and brick layering hence may not be an ideal solution where the soil conditions are not good for making bricks. However, where bricks and brick masons can be easily procured and where there is an assured long term supply of fuelwood or biomass the brick kilns can be set up as permanent unit to produce charcoal at economic rates. The brick kilns are an ideal solution to the FSFF model described earlier.

Steel / Metal Kilns

These kilns are typically drum shaped and either set-up vertically or horizontally based on design and capacity. In SSA, there are several examples of oil drums being reused for kiln design. Some varieties of steel kilns can be portable hence have lower capacities. The portable kilns can be dismantled (typically into 3 parts - drum body, a conical top in case of vertical design, and the chimney) which can then be easily rolled from one location to another.

The heavier non-portable steel kilns have larger capacity, are robust in construction and have less turnaround time. But steel kilns are expensive to build and life spans of 2-3 years make them suitable only where cost of capital is low. These kilns are relatively more sophisticated to operate and kiln operators require to be trained.

Building Block 4: Charcoal Briquettes

Charcoal briquettes from agricultural waste and biomass residue provide an ideal sustainable alternative to conventional charcoal if priced competitively. Briquetting technique allows the conversion of biomass residue into uniformly shaped blocks (briquettes) of charcoal that are easy to use, transport and store.

The idea of waste briquetting is to use materials that are otherwise useless due to lack of density by compressing them into a solid fuel of convenient shape that can be burned like wood or charcoal. The briquettes have better physical strength and combustion properties than the initial waste. Briquettes can be used in combination with efficient cookstoves in households without requiring significant change to existing cooking practice. Briquettes are known to have higher energy and heat quicker in less time with less smoke compared to wood charcoal. The raw material for briquette making varies greatly and depends on what is available locally.

Waste from Timber Industry

Export of timber is one of the key industries in several countries of SSA. Wood waste, often in form of sawdust and woodchips, can be collected from sawmills and put through a mechanical drying process. The dry raw material is then channeled into a compressing equipment or forming machine to produce sawdust briquettes. These can be sold directly as non-carbonised briquettes or carbonised in a specially designed briquette kiln.

Waste from Palm Oil Production

Palm oil is a common cooking ingredient in the tropical belt of Africa. Palm kernel shells share similar characteristics to coconut shells. They both possess a highly fibrous shell, making it the raw material of choice for the production of high quality charcoal. As a raw material for briquettes, palm kernel shells offer the same calorific characteristics as coconut shells and their small shell size makes it easier to carbonise for mass production. The carbonised kernels can be used directly or pressed into briquettes.

Waste from Agriculture Residue

Agricultural waste is an ideal source for charcoal. Charcoal briquettes can be made from corn cobs, stalks etc. When a crop is harvested, only certain parts of a plant such as grain, fruit, pods or tubers are used. Waste is produced in large quantities and most of it is burnt in open fields. The principle of using agricultural waste for briquette making is similar to sawdust and involves a process of drying, stacking, carbonisation, grinding and briquette making. For a detailed guide see a report titled 'Fuel from the Fields: Charcoal from Agricultural Waste' by Practical Action.¹⁷

There are data gaps in regards to the amount of agriculture waste and wood residue available. Better quality information can facilitate the use of waste and residues as a potential raw material for briquetting. This in turn can play a role in improving the rural economy similar to charcoal from wood.



FROM WASTE TO ENERGY

Challenges in Cooking Energy

Access to cooking energy is increasingly becoming a challenge and poor households are trapped in poverty cycles as most of their income is spent on it. Desperate to put food on the table for their families, poor women often resort to using unhealthy sources of fuel such as plastic waste and even old clothes and shoes. In an effort to reduce costs of cooking fuel, they also abandon nutritionally rich traditional foods that take long to cook, further affecting their families' nutrition security. Cooking a meal is a desperate need that has been noted to cause women to exchange their food rations for fuel in refugee camps.

Briquetting Technology

To address these challenges, women and youth have turned to briquetting biodegradable waste into fuel. They make the fuel briquettes by compacting dry biomass materials such as charcoal dust, sawdust, coconut shells, sugarcane bagasse, maize cob, cow dung, paper etc. For those materials with low agglomerating or binding capacity a binder such as soil is used and water is added to the mixture. The mixture is compacted by simple techniques such as moulding it using bare hands, recycled plastic cans or a manual metal or wooden press. For large-scale production of briquettes big machines using electricity are used to densify the mixture. The solid units are then dried in the sun and used for cooking just like firewood or charcoal. This is a simple local innovation that spreads spontaneously or through external support. Fuel briquette enterprises create employment for women and youth, thus empowering them. The briquette-making groups also help strengthen community-based institutions through enhanced social networks, informal savings and credit facilities. The technology also contributes to environmental management through recycling waste and saving trees.

Benefits of Briquettes

Briquettes are cheaper than other cooking fuels, for example charcoal briquettes made from charcoal dust (80%) and soil (20%) are 9 times and 15 times cheaper than lump charcoal or kerosene respectively. One needs 850 grams of briquettes to cook a traditional meal commonly known as Githeri which is a mixture of 500 grams of green maize (*Zea mays*) and 500 grams of dry common bean (*Phaseolus vulgaris*); at a cost of Ksh 3 (US\$ 0.04) if one were to buy the fuel, and Ksh 2 (US\$ 0.02) if one were to produce it. Cooking the same meal with charcoal and kerosene costs Ksh 26 (US\$ 0.3) (890 grams of charcoal) and Ksh 45 (US\$ 0.5) (0.36 litres of kerosene), respectively. It takes three hours to cook Githeri using any of the three types of fuel.



It is therefore not surprising that in areas where briquettes are produced, such as in Kibera informal settlement, 70 per cent of households within a radius of 250 metres from the production zone use them for cooking and save up to 70 per cent of income spent on cooking energy. Main customers of briquettes include factories, institutions such as schools, commercial enterprises such as hotels, households, poultry farms hatching chicks, bakeries, and others. There are also other reasons why consumers like briquettes. Briquettes made of 80 per cent charcoal dust and 20 per cent soil burn for over four hours, compared to two and a half hours for regular charcoal. The briquettes emit neither smell nor sparks. Briquettes produce less smoke than charcoal and leave no soot on pots. Indeed, experiments have proved that the above type of fuel briquette reduces household indoor air pollution with carbon monoxide (CO) and fine particulate matter (PM 2.5) by 1/3 and 1/9 respectively, compared to regular charcoal. A further environmental benefit is the use of recycled materials in briquettes. Nairobi for instance, generates 2,000 tonnes of waste, only 40 per cent of which is collected and disposed of properly. As in many cities in Sub-Saharan Africa, approximately 70 per cent of this waste is biodegradable, presenting a huge potential for briquettes.

Briquettes are also gaining popularity in the tea industry. At Makomboki tea factory in Murang'a county for instance fuel briquettes are produced from sawdust and the factory is saving up to 25% of the money spent on energy when supplementing firewood with briquettes at a 50:50 ratio. This sector, among others, presents a huge market potential for communities making briquettes as the factory still has a deficit of about 70% of its briquette demand.



Briquetting is Widely Spread in sub-Saharan Africa

Briquette production is taking place in the region. For example briquettes are being made from charcoal dust and generating income for disabled women in Mogadishu, Somalia, a war torn country. In Accra, Ghana, a private company is producing briquettes from sawdust for export while in the same country research is going on in production and marketing of briquettes made from municipal solid waste and human faecal sludge. Goodfire Uganda Ltd (GU) in Kampala, Uganda, produce briquettes from charcoal dust collected from charcoal traders mixed with cassava starch and market them locally.

For briquette-making communities to prosper and bring their full potential to bear, local authorities need to provide increased assistance to these small enterprises, in particular to the construction of appropriate infrastructure such as beds for drying and selling, as well as stores. Access to water needs to be provided at a reasonable cost, acknowledging fuel briquettes as a productive commercial sector. There is also need for further studies to assess the potential supply of a wide range of biomass materials and quality of varieties of fuel briquettes to reduce pressure on trees for charcoal and firewood. Increased demand for briquettes could be achieved through robust marketing that includes packaging, labelling and awareness raising on their benefits.

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World Agroforestry Centre (ICRAF)



Carbonisation: Policy Objectives

- These building blocks relate to charcoal production technology. From a policy standpoint, governments need to view sustainable charcoal technologies similar to those of renewable energy and energy efficiency and thus facilitate a policy environment that supports development and innovation in this industry.
- Create appropriate fiscal measures to support the development of a new industry/technology.
- Facilitate data collection, especially in regards to raw material for briquetting.

Carbonisation: Policy Recommendations

Gather Information

Surveys of charcoal producers in various regions should be conducted in a non-confrontational and confidential manner. Data collected should include: kilograms of wood needed to produce one kg of charcoal, estimated number of charcoal producers, volume of charcoal produced, wood used in charcoal production etc.

Information about briquette production should also be gathered. This information should include: companies/individuals producing briquettes, volume of briquettes used, type of waste used in briquettes etc.

Create Capacity

Training for producers: Charcoal production using traditional earth kilns requires little specialised knowledge and as a first step, the efficiency rates from wood to charcoal can be significantly improved by providing training

to charcoal producers through drying of wood and the use of efficient kilns. This can provide the basis for the development of a nationwide program to sensitise and train charcoal producers about how to improve the efficiency of carbonisation.

Training and institution building for the acquisition and use of biomass waste, such as agriculture and wood residues, can be offered to entrepreneurs interested in the production of briquettes. This would include aspects such as establishing cooperatives of waste producers, setting up collection points for the waste, proper waste management (including transport and storage). Briquette factories can be encouraged through soft loan schemes and tax breaks, financed through a Charcoal Fund.

Establish demonstration projects to promote tried and tested solutions.

Create a Policy Framework for Desired Technology and its Uptake

Promote Specific Kilns: Policy information regarding carbonisation remains unclear in many countries as policies do not explicitly mention the use of specific kiln types but leave it at ‘promote the use of efficient kilns’. This leads to challenges related to access of finance such as bank loans.

Introduce Briquetting: Similarly there are no well-known policies that promote the manufacturing of briquettes and current efforts are entirely private sector driven. Introducing briquetting should be viewed similar to introducing a new technology or industry into a country and national policies that promote industrial growth should be made applicable to briquetting. This can take the form of building capacity in financial institutions, providing tax breaks, soft loans, easing imports for importing briquetting machines, promoting research and facilitating exchange of information.

Promotion of the Use of Efficient Kilns should be highlighted in all national forestry documents, such as the Forest Code, National Forestry Plan and energy documents such as National Energy Efficiency Plans, Energy Code etc. When providing charcoal production permits to cooperatives, the use of efficient kilns should be encouraged. One possible way to provide incentives for producers to use efficient kilns is to charge a lower price for a charcoal production permit if an efficient kiln is used.

Taxing: A regulated tax system could be designed whereby charcoal produced from efficient kilns is taxed at a lower rate than charcoal produced by traditionally. Collection of taxes on charcoal can be a challenging task and an innovative enforcement system needs to be put in place so that the tax collected from various types of charcoal is appropriately channeled back to local authorities and to a Charcoal Fund.



Carbonisation: Financing Options

National governments can seek out international funds for promoting energy efficiency and additionally can encourage entrepreneurs to seek out partners in industrialised countries to target other sources of funding. The latter can be of particular interest for charcoal briquetting.

NAMAs

Technology intervention and capacity building is an integral aspect for development of NAMAs (Nationally Appropriate Mitigation Actions) – an evolving climate framework that generates international finance through innovative interventions.

The Africa Enterprise Challenge Fund

(AECF) hosted by the Alliance for a Green Revolution in Africa (AGRA) is aimed at encouraging private sector companies in Africa to compete for investment support for new and innovative business ideas. It operates as a ‘challenge fund’ to stimulate private sector entrepreneurs in Africa to innovate and find profitable ways of improving access to markets and the way markets function for the poor, particularly in rural areas.

The Fund awards grants to private sector companies to support innovative business ideas in agriculture, agribusiness, and renewable energy, adaptation to climate change and access to information and financial services. Its purpose is to improve incomes of smallholder farmers and the rural poor.

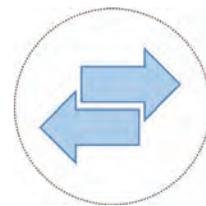
The Renewable Energy and Adaptation to Climate Technologies (REACT) is a special fund under the AECF that is open to business ideas based on low-cost clean energy and solutions that help stakeholders adapt to climate change.

UNEP Renewable Energy Enterprise Development (REED)

The Renewable Energy Enterprise Development (REED) programme is a UNEP Energy effort focused on enterprise development and seed funding for clean energy entrepreneurs in five African states of Ghana, Mali, Senegal, Tanzania, and Gambia (apart from select countries outside Africa). REED investments are placed in small and medium-size enterprises (SMEs) that deal in clean energy products and services, a sector generally considered too risky to attract conventional sources of finance.

An underlying goal of REED financing structures is to prepare young enterprises for later growth capital from more commercial sources. A young enterprise that successfully manages a first loan from REED is well positioned to attract later financing from a local bank. Underlying the REED approach is a shift from conventional grant-based technology demonstration programmes to the seed capital business. The REED fundings are tailored to the specific region’s needs. Examples of projects include a solar thermal start-up in Senegal, charcoal briquette manufacturing from agricultural by-product in Mali, and solar crop drying in Ghana.

LOGISTICS



Building Block 5: Transportation

Transportation of charcoal is the more visible aspect of the charcoal value chain, characterised by old trucks lumbering down bad roads overladen with bags of charcoal. The ‘middlemen’ (transporters, wholesalers and distributors) bridge the supply and demand side of the trade.

Transportation of charcoal in trucks

Medium capacity trucks in the range of 5 to 20 tons seriously exceeding their carrying capacity is the most common form of bulk transportation in SSA. Some of the trucks may be licensed to carry charcoal but often do not meet the safety regulations making them prone to accidents. The trucks are often hired out by the middlemen who negotiate bulk purchase of charcoal between rural producers and city based bulk buyers.

Mini-trucks and utility vehicles

Drivers of such vehicles make additional income by negotiating on-the-spot prices with road-side charcoal sellers for a limited number of charcoal bags. These drivers are limited by the amount of money they can pay upfront.

Transportation of charcoal on bicycles

This is a popular form of transportation used directly by charcoal producers and small scale distributors operating from the vicinity of urban and peri-urban areas. Bicycles fixed with rudimentary fittings can transport 100-150 kg of charcoal to city based distributors or those operating in peri-urban areas. The popularity of this form of transportation though limited by the physical distance, allows charcoal producers to have a greater control on the charcoal prices by reducing the involvement of middlemen.





Stakeholders in Transportation:

Truck owners: They are the legal owners of the truck and have no direct involvement with charcoal transportation or seem to care little about the illegal nature of activity. Truck owners usually operate within a closed group (transport cartels), renting out trucks to people from within their extended family, community or commercial circle.

Truck drivers are the weakest link in this aspect of the value chain. They often need to balance their financial commitments between having to pay-off the rentals, paying off illegal tax collectors while trying to earn enough to make a living. Truck drivers are paid by the load delivered (i.e. per trip and not weight) which encourages charcoal producers to overload the trucks to minimize the cost. The truck drivers usually have their own associations with union offices located in the larger cities. This association is the ideal means to build trust and communicate with the truck drivers.

Transport agents play the role of ‘middlemen’ with linkages to the rural producers and city based distributors. The roles of the agent and wholesalers are not clearly defined with agents referring to actual people on-ground who handle the negotiations (and earn a commission) under the ultimate control of charcoal wholesalers who are the kingpins and operate the entire charcoal trade. The wholesalers together with these agents form the ‘charcoal cartel’. Given their existing political and financial influence, any policies that cut-off these agents from the value chain will be met with stiff resistance and disruption during the implementation phase.

Some governments have tried to regulate this aspect of the charcoal trade by introducing a ‘charcoal transport license’, however collection of illegal and unofficial taxes are well-known.

Successful charcoal policies will need to have an inclusive approach to tackling these stakeholders.

Building Block 6: Distribution of Charcoal

Bulk charcoal sellers can commonly be found in the marketplace, creating the hub for charcoal related products. The small time charcoal retailers who repackage charcoal in smaller quantities however can be found scattered across the city, giving them better access to the end consumers. Small quantities of charcoal can also be purchased from shop owners.

Transportation, wholesale and distribution of charcoal are undoubtedly the least understood

and most challenging aspects of building a sustainable charcoal value chain. This is due to ineffective and incoherent policies and laws, as well as inefficient enforcement.

These issues are then exacerbated by corruption and disregard for laws. Furthermore, it is not known how much in unofficial “fees” are paid along the transport and distribution journey of the charcoal.

Logistics: Policy Recommendations

Improve the Professionalism of Transport and Distribution Actors

- Establish a database of charcoal transporters and distributors. Data collection must focus not on the illegal nature of the trade (which can potentially result in transporters finding other means to move charcoal into a city) but on practical information such as the quantity, point of origin, transportation etc.
- Establish a charcoal transporters and distributors licensing system.
- Support the creation of transporters/ distributors association.

Support the Ability of Producers to Transport

An alternative to renting trucks for charcoal producers associations is to purchase trucks. This will give greater freedom regarding transport and will eliminate the need for a middle man. A Charcoal Fund can help to facilitate truck

purchases through the provision of subsidies and soft loans for cooperatives which use the trucks exclusively to transport charcoal.

Introduce Charcoal Taxation

Tackling charcoal cartels needs a more inclusive approach to ensure that the existing cartel members continue to stay employed in the charcoal trade. This can be done by setting up a mechanism for charcoal taxation that distinguishes between legal (sustainable) and illegal (conventional) charcoal. It reduces the government’s dependency on external finance while regulating the charcoal trade and involving the members of cartels as ‘tax collectors’.

Charcoal Bags: In this example, charcoal is divided into ‘legal’ and ‘illegal’ charcoal. Legal charcoal is one that is produced by licensed charcoal producers either using conventional kilns (‘black’ charcoal) or sustainable means

(‘green’ charcoal). A system of eco-labels will determine the rate with conventional charcoal taxed at a higher rate. Charcoal producers associations registered with authorities will be required to purchase ‘green’ or ‘black’ charcoal bags from either local councils or revenue collection agencies.

Charcoal Revenue Agencies: These ‘agencies’ can be private entrepreneurs – former members of charcoal cartels who are provided with alternative source of income by continuing to be involved with the charcoal trade but in a ‘legalized’ capacity. The agencies can purchase the charcoal bags from city based regional administrations and then resell them to village based associations by including a commission. These revenue agencies can also provide facilities such as transportation of charcoal. The concept of pre-purchase of bags allows the local administration to collect revenues upfront thus creating incentives to promote legal charcoal.

Taxing Illegal Charcoal: All charcoal that is produced by un-licensed charcoal producers and transported in un-labelled bags is illegal

charcoal. The revenue agencies can be selected through a bidding process (e.g. a bidder who can provide the highest tax collection gets the contract with a 50 per cent upfront payment). As the cartels are familiar with transportation routes, charcoal producers etc, they can seek out the illegal charcoal and levy a tax. All revenues generated from illegal charcoal can be deposited into a Charcoal Fund. It is hoped that the inconvenience of this taxation will encourage actors of illegal charcoal to opt for the legal route. The local administration can support this transformation through necessary capacity building and finance.

Charcoal Warehouses or Depots

The construction of charcoal depots in urban areas can yield many benefits. Apart from serving as a centralised point and helping reduce the congestion in the city caused by numerous overloaded trucks, the depots are ideal points for data collection. Information regarding the daily purchase price of charcoal at the warehouse (similar to agricultural commodity price) can be provided free to producers/transporters via SMS/text.

Logistics: Policy Objectives

- Regulate the trade and reduce any negative impact from a potential backlash by existing stakeholders.
- Decrease payments requested en route by charcoal transporters.
- Increase transparency.
- Build competence of the actors, increasing efficiency and reliability.
- Support the development of a charcoal taxation model that can facilitate the transition from conventional to more sustainable charcoal practices.
- Pursue an inclusive approach that allows existing stakeholders to play a role in the transformed charcoal value chain.

DEMAND SIDE MANAGEMENT



Building Block 7: Marketing Charcoal

As charcoal is one of the basic necessities, there has been no need for charcoal marketing. Some marketing efforts have been undertaken by briquette manufacturers. Marketing efforts will have to be made to create a market demand for sustainable charcoal, thus providing charcoal producers and other actors with an opportunity.

The perception of charcoal use in SSA is that of a cooking fuel for the urban poor. While that is mostly true, charcoal consumption patterns can vary greatly, from large-scale consumers who buy in bulk quantities to individual households who buy based on daily needs. The key issue affecting the consumption of charcoal is cost.

Industries: While heating requirement in industries is one of the primary drivers of charcoal demand, its impact is often less acknowledged and understood. It is not uncommon for industries to have boilers that are fed with biomass and charcoal. Charcoal not only offers a cheaper alternative to fossil fuels but also an assured supply considering that several SSA countries are dependent on fuel imports, often transported in rickety trucks travelling on poor quality roads that cause further delays and accidents. Moreover, these fossil fuels are taxed at international borders which further increases their cost. Industrial consumers typically procure bulk quantities of charcoal from wholesalers and are offered bulk discount rates.

Restaurants and Food Stalls: The use of charcoal for cooking at roadside food stalls and restaurants is relatively more visible given the nature of the trade, and this particular group is more particular about the quality of charcoal being supplied. While softwood charcoal is quicker to ignite and provides intense energy, there is an equal demand for hardwood charcoal which can provide continuous heat for a period of time required to keep the food warm over 3-4 hours. Through experience the chefs – mostly women, can identify between the types of charcoal being supplied. However, there exists no formal system for identifying charcoal quality. At present, the quality of charcoal supplied is based on trust and goodwill.

Organisations and Schools: These employ chefs who use significant quantities of charcoal in combination with woodfuel in large capacity cookstoves. However, unlike restaurant operators, there is no revenue generation and keeping fuel cost low is of prime concern.

Households: Typical households using charcoal are urban low income to middle class or peri-urban residents with limited access to firewood on a regular basis. The middle class usually buy charcoal in bags up to 5 kgs while lower income buyers base their consumption on the daily wage available.

ECO-LABELS

One of the means to market charcoal could be through a system of 'Eco-labels'. Basically, an Eco label is a graphic labelling system which identifies overall environmental performance of a product (or service) based on multiple factors. Eco-labelling has a number of major benefits:

Informing consumer choice: Eco-labeling is an effective and visual way of informing customers about the environmental impacts of selected products. It empowers people to distinguish between products that are harmful and those more compatible with environmental objectives.

Promoting economic efficiency: Eco-labeling is generally cheaper than regulatory controls. By empowering customers and manufacturers to make environmentally supportive decisions, the need for regulation is kept to a minimum. This is beneficial to both government and industry.

Stimulating market development: When customers choose eco-labeled products, they have a direct impact on supply and demand in the marketplace. This is a signal which guides the market towards greater environmental awareness.

Encouraging continuous improvement: A dynamic market for eco-labeled products encourages a commitment to continuous environmental improvement.

Examples for Eco-labeling Schemes:

- Information on the woodlot/biomass: Consumers can benefit to know that charcoal from a particular species of hardwood or softwood tree may be of better quality and therefore be willing to pay a premium.
- Information on kiln: The type of kiln can determine the quality and efficiency (and therefore the quantity of biomass consumed) of the charcoal.
- Information on social parameters such as number of people employed, the beneficiaries, the actors etc. This information can support gender equality and women's empowerment.
- A geographical label can build competition in the market: A certain region may have a reputation for producing better quality of charcoal and other regions can strive to get that premium price through improvements.

Policy Action:

A Charcoal Taskforce could be responsible for establishing and promoting an eco-labelling program for black (conventional) and green (sustainable) charcoal. The Charcoal Taskforce would develop standards in partnership with appropriate technical institutes; establish an accreditation process to accredit auditors to verify the charcoal and design labels for bags which communicate the type of charcoal contained in the bag.

Building Block 8: Charcoal Cookstoves

Government actions need to support market creation and expansion of efficient cookstoves. Any improvements in the efficiency of cookstoves can lead to a lower demand for charcoal. With efficient cookstoves having undeniable advantages such as cutting fuel costs or reducing the time spent gathering firewood, the reluctance with which households approach this technology seems surprising. However, household decisions are complex.

This handbook therefore advocates that governments should work in partnership with the country led efforts of the Global Alliance for Clean Cookstoves (GACC) which operates in several countries in SSA. The GACC is an innovative public-private partnership, led by the United Nations Foundation and comprising over 600 partners, set up with the objective of promoting use of clean and efficient cookstoves in developing countries.

The GACC website (www.cleancookstoves.org) and publications provide market assessments undertaken by its member organisations in various countries including consumer behaviour, preference information, and other research studies.¹⁸ The GACC is currently in the process of developing an ISO standard 'ISO/TC 285 Clean Cookstoves and Clean Cooking Solutions' which will define clear methods and quantitative values for efficient cookstoves and standards.

A partnership avoids duplicating efforts and takes advantage of the existing networks, international finance and support programs. National cookstoves policies need to be developed in consultation with the stakeholders of the respective country unit of the GACC with qualitative targets aligned. The GACC actors include cookstove manufacturers, briquette manufacturers, institutions that provide finance, capacity building, technology support etc.

Finance for Clean Cookstoves

The existing climate frameworks such as 'Clean Development Mechanism' (CDM), Programme of Activities (PoAs) and even Nationally Appropriate Mitigation Actions (NAMAs) can promote the usage of efficient cookstoves by securing finance through sale of carbon credits. Developing PoAs under the UNFCCC frameworks can be an important facilitation tool for involving the private sector in SSA.

A Charcoal Taskforce can also promote Voluntary Carbon market Standards (VCS), such as the Gold Standard which have additional

emphasis on sustainable development elements. Soft loans can support SME manufacturers to establish a countrywide network.

In regards to REDD+, cookstoves and sustainable woodlots are being considered within national programmes, the finance being channelled towards these investments is said to be far below the scale required, as a recent study has shown. The authors recommend greater alignment and coordination between cookstove and REDD+ agendas.¹⁹

'Successful implementation and sustainability of an improved stove are subject to the influence of informal opinion leaders, a woman's ability to exercise independent decisions within the household, the cost of the technology itself, and perceptions of the utility of an improved stove over a traditional stove, weighed against cultural predilections about abandoning old ways of cooking.'²⁰

Demand Side: Policy Objectives

- Focus marketing activities on urban and peri-urban areas.
- Create an 'enabling environment' for promoting efficient cookstoves.
- Recognise policy options for demand side management

Policy Recommendations

Overcome Barriers

Help GACC members to overcome major market barriers in order to ensure the development of a sustainable cookstoves market.

Raise Awareness

of the efficiency levels of various cookstoves and promote healthy competition among manufacturers. Awareness campaigns can provide additional information about finance schemes and soft loans that can be made available to buyers to purchase cookstoves. Creating a market demand through educating people is crucial for the success of efficient cookstoves programmes.

Support Innovation and Differentiated Products

As efficient cookstoves target the entire spectrum of customers from an urban middle class to peri-urban dwellers, policies should encourage the development of different quality grades of cookstoves designed for specific target market segments and appropriately priced.

Mobilize Change

High-level national support, donor commitment, and investment will help drive the universal adoption of clean cookstoves and fuels.

Reach Scale

Emphasis on reaching scale through market based solutions will ensure the greatest impact through long-term adoption of clean cooking solutions.

COOKING INNOVATIONS

One of the novel innovations that could reduce the burden of sourcing firewood, reduce expenditure on cooking fuel, save trees and improve kitchen air quality is a domestic gasifier. A gasifier burns biomass under controlled oxygen where the volatiles and tars are burnt and charcoal and wood gas are made. The resulting gas mixture and charcoal can be used as energy.

A domestic gasifier has three parts: the top part is a gas chamber, 15 cm in height where combustion of gases take place; the middle inner part is a fuel canister that is 22 cm high where gasification takes place; and a lower air inlet, 6 cm in height. The gasifier is lit at the top and primary air enters at the bottom and moves up through the packed bed of fuel. The gasifier is lit outside using dry tree pruning, leaves or paper and taken into the kitchen after the fuel has caught fire and stopped smoking.



When the flame goes out, it means the charcoal is ready. One can also lift the pot to check if the charcoal is ready. To harvest the charcoal, one removes the cooking pot and then the top part. The charcoal in the fuel canister is emptied in a pot and covered completely for about 30 minutes to stop oxygen supply and any further burning. Communities that use the gasifier prefer to empty the charcoal onto the ground and cover it with soil. This way, it takes less than five minutes to cool down. After that, the cooled charcoal is picked carefully – avoiding soil so as not to reduce its heating value – and stored in another container, ready for use. Studies are on-going to assess the benefits of using charcoal from the gasifier cook stoves as soil amendments for increased crop productivity.

The gasifier produces low emissions which could reduce premature deaths and costs of health associated with smoke in the kitchen which mainly affect women and children. This benefit of the gasifier contributes to sustainable development goal (SDG) no 3, 'ensure healthy lives and promote wellbeing for all at all ages'. As this cook stove uses crop residues, tree prunings and twigs in low amounts it reduces women's and girls' burden in fetching firewood, freeing time for other productive activities for women and schooling for girls hence addressing SDG no 7, 'achieve gender equality and empower all women and girls'. Women's perception of the gasifier despite its multiple benefits is that it is expensive (Ksh 3000, US\$35), fails to heat space as good as the traditional three stone cook stove and the galvanised steel walls get very hot posing risks to burns. There is therefore need for capacity building on efficient use of the gasifier, improvement on design to meet local needs and understanding of social-cultural issues around cooking. There is need for mindset change and awareness-raising on the benefits of improved cooking technologies for improved livelihoods and environment.

This article is an excerpt from: Njenga, M., Iiyama, M., de Leeuw, J., Röing de Nowina, K., Kätterer, T., Kimutai, G., Sundberg, A. (2015). Keeping healthy and saving trees, Miti April - June 2015 37.

The article is based on on-going research that is investigating the feasibility of small-scale bio char production and use to improve livelihoods on smallholder farms in Kenya by World Agroforestry Centre (ICRAF), Swedish University of Agricultural Sciences (SLU), International Institute of Tropical Agriculture (IITA) and Lund University

RECOMMENDATIONS FOR GOVERNANCE

Formalisation of the charcoal value chain needs to start with establishing institutions that can then be entrusted with the task of developing and implementing coherent policies and regulations. The following institutional set-ups are recommendations only and countries need to identify the most suitable structure.

Inter-ministerial Steering Committee

The establishment of an inter-ministerial steering committee to discuss coherent activities leading to improvement of the charcoal value chain is of utmost importance for effective coordination. Charcoal policies are influenced by issues which fall under a number of ministries – e.g. Ministry of Energy, Ministry of Forests, Ministry of Agriculture, Ministry of Finance, Ministry of Environment, Ministry of Planning and their respective implementing agencies.

Such a committee can provide a single voice for sustainable charcoal policy development. This will ensure that there is limited scope for individual agendas of different stakeholders that can potentially hinder the development process. It is proposed that a country establish such a steering committee with the mandate to coordinate the development of sustainable charcoal policies. One may need to be sensitive about avoiding bruising egos when setting up such a committee and it is recommended that this ministerial group is headed by a figure who commands significant influence and authority in decision making.

National Charcoal Taskforce

Government agencies or regulatory authorities (e.g. for electricity, forestry or even the internet) are a commonplace across the globe. Potentially based under a specific Ministry, this will be the federal implementing agency and responsible for coordinating and facilitating charcoal related activities in the country including acting as the national coordinating and managing entity (CME) for international donor finance and MRV (measuring, reporting and verification). Key tasks of the Charcoal Taskforce will include:

- **Data Collection:** Act as the one-point-contact for all charcoal related information including social, economic and environmental impacts from greening the value chain.
- **Eco-Labelling and Standard Setting:** Establish quality standards for types of charcoal, efficiency levels of cookstoves, carbonisation technology etc.
- **Awareness Creation:** Create a market environment for the introduction of new technologies and products.
- **Licensing:** While the physical issuing of licenses and permits can be decentralised, the taskforce can set the overall standards and maintain a database of actors.
- **Capacity Building and R&D:** Similar to licensing, the actual capacity building and research can be decentralised with the taskforce coordinating with various institutional stakeholders (e.g. universities, technology centers)

The taskforce should include four major groups of stakeholders. As the implementing agency, it should be led by representatives of the steering committee. The policies will be converted to implementable actions by 'management teams' with dedicated focus. The third group will involve on-ground government staff who will be stationed with regional or district administrations and will be responsible for carrying out specific tasks (e.g. undertaking training programs) and providing feedback to the taskforce. The fourth group of stakeholders will be representatives of the stakeholders directly involved with charcoal production, supply and distribution (e.g. community leaders, representatives of transport associations etc.) This will ensure that concerns of the stakeholders are heard by the steering committee to facilitate continuous improvement of the policy development process.

Charcoal Fund

Initial funding is required to start the socio-economic activities until they become self-sustaining. This can be met through a committed 'charcoal fund' which can be monitored, reported and verified periodically to ensure that the overall objectives are being met. It can deliver financing for the Charcoal Taskforce activities.

The Charcoal Fund can receive finance from international donors but a more sustainable source of funding can be established through a robust charcoal taxation policy targeting illegal charcoal activity. The Fund can support a range of activities including: seed funding, finance for R&D/eco-labels, soft loans and quick start finance, capacity building and awareness raising.

Charcoal Cooperatives

A majority of private sector actors in the charcoal value chain work independently of each other. Having these actors form co-operatives by formal registration and licensing procedures can provide several benefits including building collective bargaining power. Currently, as individuals, the value chain stakeholders have a limited voice, which hinders their ability to provide inputs and opinions regarding the development of policies and regulations. With cooperatives, the stakeholder voices will be stronger with the Charcoal Task-force taking a lead in arranging consultations with the cooperative representatives.

The second benefit is the opportunity of stakeholders to pool their resources which can help with securing bank loans, securing better prices by circumventing middlemen and directly transporting charcoal bags to urban centers and warehouses. This will lead to higher revenues and equitable distribution of wealth.

From a policy stand-point, the act of registering the cooperatives and renewal of licenses supported by on-site verification will enable the government to collect baseline data against which the social, economic and environmental impacts of sustainable charcoal policies can be measured. Data can include the number of workers and technology employed, the type and production capacity of kilns, mode of transportation and distribution.

Managing Institutional Relationships

Once institutions such as the steering committee, Charcoal Taskforce and cooperatives are established, it is imperative that there exists a good working relationship and exchange of information between the institutions. While the roles and responsibilities of each need to be clearly defined and budget allocated, meetings need to be conducted between these stakeholders to ensure that a common vision continues to evolve along with stakeholders' evolving opinions and action. Similarly, cooperatives need to be involved in the discussions. The informal participants must be given the opportunity to express their concerns and opinions. This will result in more successful development and implementation of new and revised policies.

Decentralisation

Decentralisation has been one of the mantras for good governance in some SSA countries. It is a process of redistributing or dispersing functions, powers, and people away from the centre to regional, provincial or district level. In order to facilitate the formalisation of a charcoal value chain, government services should be decentralised and brought down to an accessible local level. While certain aspects of the decision making needs to be retained at national level (e.g. setting a charcoal eco-label standard), most aspects of the politics of the value chain, particularly dealing with implementation, need to be divested to regional governments.

In the context of charcoal, decentralisation may be the key to proper enforcement, if a taxation system which motivates the regional / provincial governments to promote sustainable charcoal is established. Charcoal producing regions (with large forest reserves) are often economically weaker compared to the more urban and economically stronger charcoal consuming regions. A charcoal taxation system has the potential to restore this economic imbalance.

Incentives

Together with improved enforcement and good governance, policies and regulation should also be revised or designed in a way that increases incentives and decreases disincentives for compliance. Incentives can be provided in the form of finance (e.g. subsidies or tax incentives), technology or capacity. To reduce disincentives, the process for compliance should be facilitated. Therefore, a combination of carrot (incentives) and sticks (improved enforcement and governance) needs to be included in the design of a formalised value chain. After a long history of having an informal charcoal value chain, it will take a number of tools and time to formalise the value chain.

FORESTS FOR PEOPLE

In the International Year of Forests 2011, the World Future Council presented the Future Policy Award to exemplary forest policies that sustainably protect, enhance, and utilise forests. The National Forest Policy of Rwanda, initiated in 2004, won the gold award and the Gambian Community Forest Policy received the silver award.

The **Future Policy Award** celebrates policies that create better living conditions for current and future generations. The aim of the award is to raise global awareness for these exemplary policies and speed up policy action towards just, sustainable and peaceful societies. Its methodology is based on the Seven Principles for Sustainable Development Law.

Following the Award, the World Future Council has facilitated knowledge exchange on forest policy in East Africa, bringing together Members of National Parliaments, policy-makers, researchers, international experts, activists and youth to raise awareness of some of the best solutions in place to halt and reverse the plight of forests in Africa.

Our key engagement tools were annual **Inter-Parliamentary Hearings** in cooperation with national parliaments, environmental ministries and other partners, in Rwanda (Kigali, 2012), Tanzania (Dar es Salaam, 2013), Kenya (Nairobi 2014). The parliaments of Ethiopia, Kenya, Malawi, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe sent delegations to the Hearings.



‘From meetings like this you learn to understand the things you see every day at home and you learn how to act.’

Hon. Anastancia Ndhlovu, Member of Parliament, Zimbabwe, Chairperson of the Environment, Water, Tourism and Hospitality Industry Committee, Vice President at World Federation of Democratic Youth

‘On behalf of the Zambian delegation I want to thank for this extremely wonderful interaction. We are very impressed and we have been challenged to go back, work on the ground on implementation of issues of forest destruction such as logging, mining, and charcoal production. We are going home highly determined to make a difference.’

Hon. Prof. Geoffrey Lungwangwa, Member of Parliament, National Assembly of Zambia, Chairperson of the Committee on Lands, Environment and Tourism, former Minister of Communications & Transport, former Minister of Education



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This handbook is based on a 2014 study by Arindam Kumar Basu on policy options for sustainable charcoal which the World Future Council has commissioned. Arindam Kumar Basu is involved in two NAMA policy framework studies on sustainable charcoal in West Africa and co-authored a UNDP study for sustainable charcoal in Uganda. He has good experience in dealing with rural energy topics and the supporting policy development. He currently works for an international energy and environment consultancy in Denmark. Arindam Kumar Basu is leading UNDP's LECB (Low Emission Capacity Building) efforts in several countries. This involves providing technical assistance and capacity building for climate finance and MRV.

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IMPRINT

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Commissioned by:

The World Future Council, Hamburg, Germany
Published: 2015

Photos:

Nathalie Bertrams: cover, back cover, p 1 (l), p 7, p 15, p 17, p 23, p 29, p 53
Simon Wilkie: p.1 (r), p 38, p 39. Goran Gajanin: p 9 (l)
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Aisha Karanja: p 10, p 11. Shutterstock: p 8 (l), p 9 (r), p 41

Design: Karin Hahn

Layout: Ina Neuberger

Print: John Meinert Printing (Pty) Ltd., Windhoek, Namibia

Paper: Triple Green Silk. Sappi South Africa.
60% sugar cane fibre, chlorine free, sustainable afforestation.

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The World Future Council was launched in 2007 by Jakob von Uexkull, Founder of the 'Alternative Nobel Prize'. It operates as an independent foundation under German law and finances its activities from donations.

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