

Diverse Options Exist for Securing Sustainable Feedstock for Charcoal in the Global South

On February 10, 2021, The Charcoal Project hosted a webinar titled "Securing Sustainable Feedstocks for Wood Charcoal." This policy brief summarizes the findings from various projects and lessons and recommendations made during the webinar. The Charcoal Project is a US-based nonprofit focused on finding sustainable solutions for those that rely on biomass for their primary energy needs.

EXECUTIVE SUMMARY

Charcoal is the primary energy used for cooking and heating in millions of homes and restaurants in the Global South. In Africa alone, which produces 65% of global production, an estimated 195 million people are engaged in the production of firewood and charcoal. Despite decades of efforts to transition away from charcoal, **consumption is growing and expected to increase** in the foreseeable future as it continues to be the most affordable, accessible and preferred cooking fuel. Where wood supplies are diminishing, **growing demand for charcoal threatens forests and forest-dependent livelihoods**; it also frustrates efforts to reduce greenhouse gas emissions and curb biodiversity loss. Securing biomass that is renewable, reliable, economically viable and culturally acceptable is urgently needed in the Global South to develop sustainable charcoal sectors. In this policy brief, we present three tested approaches for producing feedstock for charcoal that can be applied to diverse contexts.

THE CHARCOAL FEEDSTOCK CHALLENGE

Most charcoal in the Global South is produced from woody biomass that is sourced from trees or branches in natural forests and woodlands, fallows and farms. Recent studies indicate that approximately one third of woodfuel sourcing in the pantropics is unsustainable, with depletion hotspots most prominent in South Asia and East Africa. As charcoal producers seek out preferred tree species, woodlands are gradually degraded making them unsuitable as habitat and poor contributors to forest-related ecosystem services. Charcoal production often tails behind agricultural expansion, using up felled trees as woodlands are cleared for food production. A charcoal sector that benefits from activities that cause deforestation or from gradually degrading its natural forests is clearly unsustainable. **Securing reliable feedstock is a fundamental first step for transforming the sector into a vibrant and responsible undertaking capable of meeting current demand and planning for the future.**



SUSTAINABLE FEEDSTOCK: An Essential First Step For Establishing a Vibrant Charcoal Sector

Sustainable feedstock is feedstock that: 1) guarantees the renewability of the biomass, 2) is economically viable, 3) ecologically wise, 4) provides dignified livelihoods for producers and biomass owners, and 5) is respectful of the laws, institutions and cultures of local actors. Growing, nurturing, and managing trees and forests for charcoal should improve human well-being by reducing poverty, enhancing food security and health. Producing biomass for charcoal should regenerate rather than deplete forests; it should empower rather than marginalize communities. Securing sustainable feedstock for charcoal should promote security of tenure over land, trees and forests. In doing so, sustainable feedstock fulfills multiple dimensions of sustainability: economic, social and environmental.



Well-managed mangrove forests can produce high value charcoal without damaging ecosystems

MULTIPLE APPROACHES FOR DIVERSE SOCIO-CULTURAL AND ECOLOGICAL CONTEXTS

A wide range of options exist for sourcing feedstock for charcoal sustainably. We describe three models of feedstock production that are currently applied in Sub-Saharan Africa and Asia by communities, individuals and states. South-South exchanges of such experiences can catalyze innovations and implementation of multiple feasible alternatives suitable for the diverse contexts in which charcoal is produced. These systems are replicable in other parts of the world where charcoal is produced and used.

Note however, that each model has been heavily informed by local scientific studies. These studies are ongoing to improve and adapt each system and examine its effectiveness. Involvement of a diverse range of stakeholders in designing and implementing models for producing sustainable feedstock promotes co-learning and ensures that the proposed approaches are locally feasible and acceptable.



Community members are trained to manage their forests sustainably for charcoal



Individual farmers can incorporate trees into their food systems as biomass for firewood and charcoal

Food-Energy Systems for Wood Biomass, Sub-Saharan Africa

Trees on farms are an insufficiently explored opportunity to develop resilient food-energy systems. Applying ecological concepts allows farmers to secure wood for charcoal in addition to firewood, fodder, timber and other co-benefits, such as supporting and regulating ecosystem services. In the process of managing their trees, individual farmers can sell branches and stems to charcoal producers or produce the charcoal themselves. CIFOR and ICRAF are working with communities and other partners in expanding and improving on agroforestry in many countries in Sub-Saharan Africa. For example the Governing Multifunctional Landscapes and Regreening Africa projects supported by the European Union are working in 11 countries in Sub-Saharan Africa with the aim of improving sustainable wood production for enhanced livelihoods while conserving the environment and mitigating climate change.



Pruning and thinning of trees on farms generates renewable biomass



Invasive species, like this stand of prosopis, can be managed for biomass



Community-Based Management of Natural Forests - Tanzania

Tropical dry forests harbour tree species that are highly sought for charcoal production, but which are rapidly depleted due to the absence of targeted management. When protected from grazing and fires, the stumps of many species resprout allowing trees to recover and once again become available for harvest.

Since 2012, the Tanzania Forest Conservation Group (TFCG) and the Community Forest Conservation Network of Tanzania (MJUMITA) have helped communities manage their natural forests by allocating as little as 20% of their communal land to charcoal production. Tree harvesting quotas and a system of permits ensures that producers pay for trees and adhere to agreed-upon rules, generating income for village governments, jobs and livelihoods. Part of the revenue is used to pay for forest management costs. Harvested areas are protected from fire, agriculture and other disturbances to allow for natural regeneration. The rest of the revenue is used for community-selected development projects including construction of classrooms, health facilities and water projects. Local and scientific monitoring is providing much-needed knowledge on tree and forest management of tropical dry forests contributing to continuous opportunities to learn, improve and adjust this model in other communities.



If guarded against fires, livestock and agriculture, the stumps regenerate rapidly

Sustainable charcoal from natural Miombo woodland



Managed mangroves can supply high quality biomass for charcoal and timber.

Managing Mangroves for Charcoal and Other Ecosystem Services - Malaysia

Trees in mangrove ecosystems are highly valued for charcoal and for building, making mangroves one of the most threatened ecosystems on Earth in urgent need for solutions. Fortunately, mangroves can be managed to provide multiple ecosystem services simultaneously including biomass for charcoal and firewood, trees for timber and non-timber forest products, habitat for healthy fisheries, tourism attraction and carbon storage and sequestration (as high as $>1200 \text{ Mg C ha}^{-1}$ for 30 year-old coupes of the 40,000 ha large Matang forest, Malaysia). In many regions around the world subsistence use of mangrove charcoal and firewood is a reality and is often the only feasible option for fuelwood. Large-scale commercial exploitation of mangrove forests, such as for charcoal, has to go hand in hand with sustainability in terms of mangrove regeneration, the wider natural environment and public health and socio-economy. In the light of long-term sustainability of the mangrove ecosystem as a life-supporting system for people, transition to clean and renewable energy sources should be considered in parallel.



Mangrove plantation



Harvested wood

LESSONS LEARNED AND POLICY RECOMMENDATIONS

- Most charcoal producers are small-scale farmers with limited and insecure access to trees, land and capital. Sustainable feedstock production should aim to enable rural individuals and their communities to secure tenure and access to forests or land for long-term investment in feedstock production.
- When designed with a systems perspective, sustainable feedstock production can simultaneously address multiple socioeconomic and environmental objectives. Meaningful involvement of key actors at multiple governance levels is needed to understand the interests at play and potential synergies for achieving shared objectives.
- Given that no two places are alike, feedstock production systems should be adapted to local contexts. Models for individuals, communities, private sector and the state should be considered, with the option for multiple models to co-exist.
- Managing sustainable feedstock is a continuous process with opportunities for learning and improvements. Feedstock initiatives should collaborate closely with scientists to design appropriate monitoring and evaluation programs for multiple sustainability indicators. Monitoring information should be used to assess impacts, ensure the principles of sustainability are met and to adapt the system based on new information.
- Producing feedstock sustainably should make business sense for those involved. Capacity building in business management is usually needed for individuals, communities and managers to ensure that feedstock production is economically viable and that their businesses are financially sound.

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USEFUL LINKS:

- Securing Sustainable Feedstock for Wood Charcoal Webinar, https://youtu.be/lKu0zU_1J7s
- The Charcoal Project, <https://www.charcoalproject.org>
- MAMAFOREST Project, <https://sites.google.com/site/mamaforestproject/>
- Systems Ecology and Resource Management, <https://www2.ulb.ac.be/sciences/biocomplexity/>
- TROPIMUNDO, <https://www.tropimundo.eu/>
- "Agro-ecological options for fall army worm..." <https://www.sciencedirect.com/science/article/pii/S0301479719306097?via%3Dihub>
- "Bioenergy Production on Degraded Land: Landowner Perceptions in Central Kalimantan, Indonesia," <https://www.cifor.org/knowledge/publication/7129/>
- Regreening Africa, <https://regreeningafrica.org/>
- CIFOR, www.cifor.org/gml
- FAO State of the World's Forests 2020, <http://www.fao.org/state-of-forests/en/>