

Community action planning for sustainable woodfuel production in Baringo and Kitui counties, Kenya



*Wanjira EO, Kitema A, Sola P,
Muriuki J, Njenga M*

Community action planning for sustainable woodfuel production in Baringo and Kitui counties, Kenya

*Wanjira EO, Kitema A, Sola P,
Muriuki J, Njenga M*

This publication is part of a series of briefs describing findings from the EU-funded Governing Multifunctional Landscapes Sustainable Woodfuel project, which aims to contribute to knowledge, options and engagement for more sustainable woodfuel value chains across Sub-Saharan Africa.

cifor.org/gml/sustainable-woodfuel

Key lessons

- Community action plans (CAPs) offer a low-cost option to promote sustainable charcoal production. At a cost of around 13 USD per person per day, depending on the location, county governments could integrate CAP meetings into their activities.
- Training of Trainers (ToT) is another cost-effective approach to scaling knowledge on sustainable charcoal production. Building capacity among community trainers on the CAP process would enable charcoal producer associations (CPAs) to manage CAP meetings using their revenues from charcoal trade.
- Diversification of woodfuel products could reduce pressure on forests and trees, such as through the recovery of charcoal dust at processing sites and the use of tree branches and twigs for briquette production.
- To ensure that policy requirements for sustainable woodfuel production are met, the Kenya Forest Service and county governments can collaborate with CPAs to strengthen organizational and institutional capacities.

Introduction

A people-centred approach to community planning

Kenya is highly dependent on woodfuel, which has supplied about 70% of the country's households with cooking and/or heating energy for decades (Kendagor and Prevost 2013; Singh et al. 2019). Most of the traded charcoal is produced from wood in the drylands of Kitui, Makueni, Tana River, Kwale, Narok, Baringo, Kajiado, Garissa and Wajir counties (MoEF, 2018; MENR, 2013; Mutimba and Barasa, 2005; Burrow and Mogaka, 2007). The Governing Multifunctional Landscapes Sustainable Woodfuel project is being implemented in the counties of Kitui and Baringo, which are also major sources of charcoal in the country.

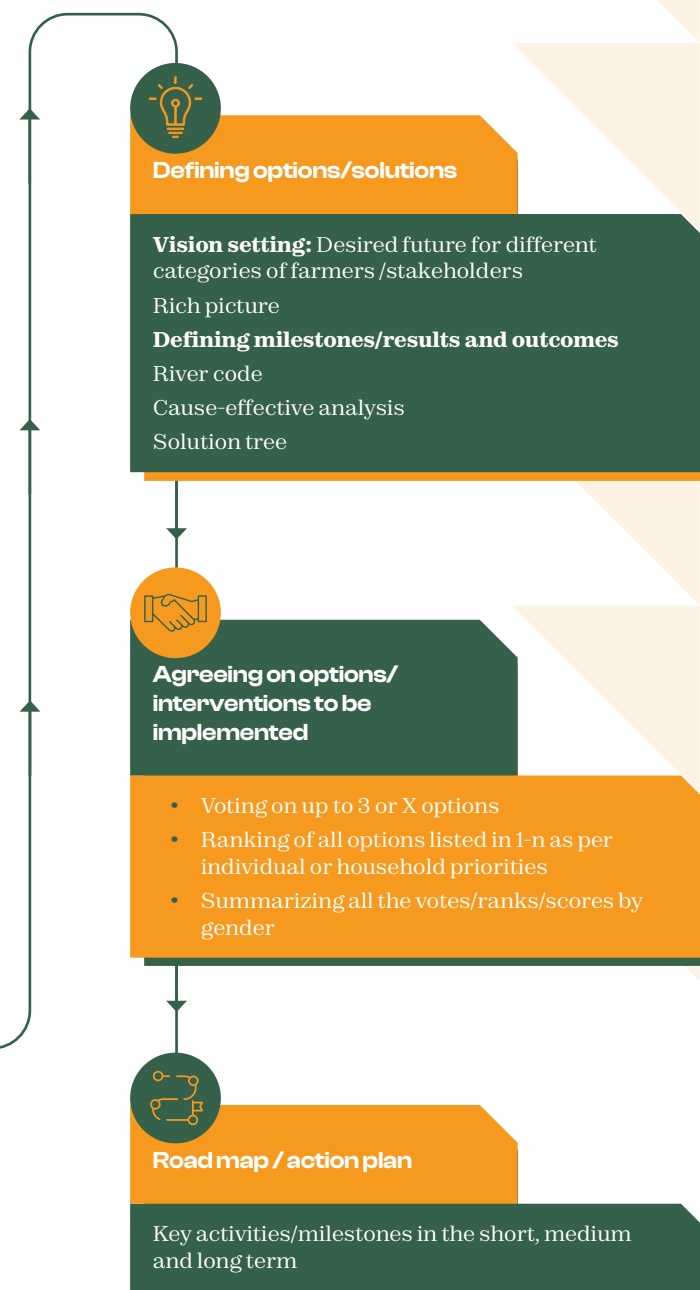
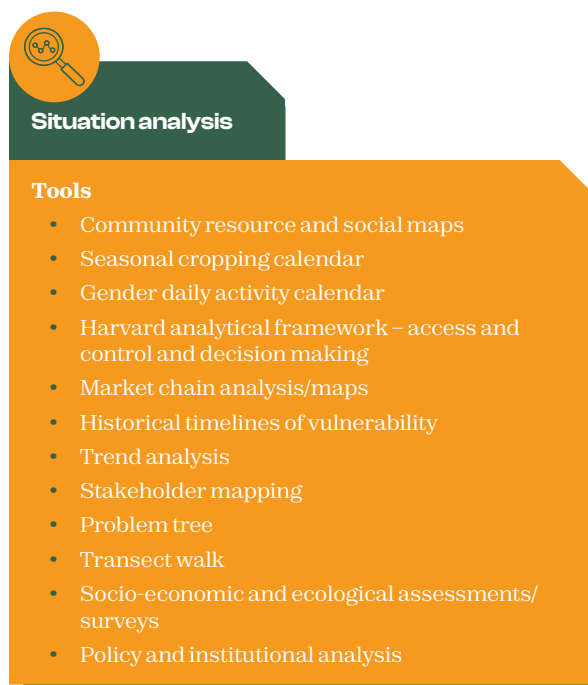
The specific target areas – which include Mwingi Central and Kitui East subcounties, and Marigat subcounty in Kitui and Baringo counties, respectively – were recommended by stakeholders during the launch of project. Both counties are located in dryland landscapes, and Baringo County is heavily invaded by the *Prosopis juliflora* shrub, locally known as *mathenge*. Baringo County is facing a wide range of challenges associated with *Prosopis*, including loss of grazing and farming lands, loss of tree diversity, and displacement of people from their homesteads as the thorny plant takes over native vegetation. *Prosopis* thickets create a suitable breeding ground for mosquitoes, leading to increased incidences of malaria, and goats can suffer tooth loss from eating the sugary pods (Mbaabu et al. 2019; Maundu et al. 2009; Mwangi and Swallow 2008). However, as described in Brief 4 of this series, charcoal production using *Prosopis* can provide communities with a sustainable livelihood option while also managing the invasive species and clearing land for agriculture (Koech et al. 2021).

Kitui, on the other hand, has experienced dwindling tree cover and tree diversity due to unsustainable charcoal production using native species (Ndegwa et al. 2020; Kipsisei 2011). Kenya's policy and legal framework on sustainable woodfuel emphasizes the empowerment of communities through charcoal producer associations (CPAs).

Therefore, there is a need to identify and test options for sustainable woodfuel (charcoal in particular) using inclusive and people-centred approaches that involve various stakeholders. A community action plan (CAP) is a tool for identifying and prioritizing interventions through community meetings involving a range of stakeholders. This brief presents findings from research on CAP for sustainable charcoal production in Baringo and Kitui counties.

There are four key steps to developing an action plan. First, the community is engaged in an analysis of the current situation using various tools to reflect on the status of natural resources, livelihoods, challenges and opportunities. The next step uses the information to craft a vision of the desired situation, including strategies and interventions needed to bring about that vision. In the third step, the community adopts participatory ranking tools to prioritize interventions for implementation. Finally, the community develops an action plan for implementing the priority interventions, as shown in the figure. In each one of these steps, gendered perspectives need to be intentionally sought out and incorporated.

Identification, prioritization, and planning for more sustainable woodfuel management





Flooded *Prosopis* trees near Lobo, Baringo County, Kenya
(Axel Fassio/ICFOR-ICRAF)

CAP meetings were facilitated from 17 to 25 June 2019 in Ng'ambo, Ilchamus and Lobo locations in Marigat subcounty, Baringo County. The three locations selected are among the areas vastly affected by *Prosopis*. A total of 160 community representatives (102 males and 58 females) participated in CAP meetings, which also brought together representatives from national and county governments, the Charcoal Producer Federation of Kenya (CPFK), the Adventist Development Relief Agency (ADRA) Kenya, and World Agroforestry (ICRAF). Outputs included resource maps (see photos), a gender-based calendar of activities, charcoal production trends, stakeholder analysis, a list of challenges faced by the community members and associated priority interventions, and a description of the communities' visions for the future (see box).

A landscape that is evergreen with clean air, high tree cover and diversity that is resilient to climate change and sustainably generating multiple benefits to the community.

Community representatives at Ilchamus
CAP meeting

Resource map for Loboi location in Marigat subcounty, Baringo County

The community identified the main challenges to achieving their desired outcomes and shared vision as: (i) the current charcoal ban; (ii) weak and inefficient CPAs; (iii) landscape degradation and loss of grazing and croplands associated with *Prosopis*; (iv) poor carbonization technologies; and (v) lack of access to improved technologies. These challenges make the value chain unsustainable and economically unattractive, especially to charcoal producers and other resource users such as beekeepers, farmers and pastoralists. To address these challenges, community members prioritized the following interventions: (i) training and stakeholder support with efficient charcoal production technologies; (ii) building the organizational and institutional capacities of CPAs; (iii) sustainable management and control of *Prosopis*; (iv) lifting the ban on *Prosopis* charcoal and trade; and others as shown in the table.

Interventions prioritized by three communities in Marigat subcounty, Baringo County

Ranking of priority interventions by location	Ng'ambo	Ilchamus	Loboi
Training and promotion of the use of more efficient charcoal production technologies	**	***	***
Building and strengthening of institutional capacities in CPAs	***	***	***
Promoting sustainable land management/restoration practices and <i>Prosopis</i> control measures (e.g., eliminating <i>Prosopis</i> from farmlands, grazing fields and riverbanks/courses; pod processing; tree nursery establishment; tree planting, etc.)	***	***	***

Priority ranking: (***) high, (**) medium and (*) low

Ranking of priority interventions by location	Ng'ambo	Ilchamus	Loboi
Developing and strengthening charcoal market systems (e.g., better prices; higher-quality charcoal; use of branding, packaging and advertising; government classification of charcoal as an energy source and consideration by the county government to reduce cess fees charged per charcoal bag).	*	***	***
Creating awareness around land tenure, tree resource use and ownership rights (including land demarcation and delineation)	**		***
Improvement and construction of more feeder roads	***	***	
Lifting the government ban on charcoal made from <i>Prosopis</i>	***		***
Promoting and strengthening village savings and loans associations	**	***	
Enforcing existing charcoal rules and regulations, acts, policies, and CPA by-laws, and raising awareness to increase compliance.	***	***	***
Control of air pollution and injury to humans through creation of tree harvesting schedules by power saw and use of protective gear against <i>Prosopis</i> thorns.	*	**	**
Long-term solutions to <i>Prosopis</i> -related health problems in both people and animals.	*		



CPA tree nursery near Endui, Kitui County, Kenya
(Axel Fassio/CIFOR-ICRAF)

Kitui County

Meetings were held in Mwingi North, Mwingi Central, Kitui East and Kitui South subcounties of Kitui County, which are key charcoal production sites. Community action planning was conducted to inform piloting and capacity development activities for both the CPAs and general community members. The CAP meetings were conducted in four locations: Endui, Nguni and Ngomeni in Mwingi Central subcounty and Endau in Kitui East subcounty. The desired outcomes and vision for the communities in these four locations are shown in the box.

Outcome and vision for communities in Mwingi Central and Kitui East subcounties, Kitui County

Outcomes and Vision

1. Improved charcoal production
2. Improved water availability for agriculture and domestic uses
3. Improved charcoal market systems
4. Acquired knowledge and skills on improved charcoal production and modern farming technologies.
5. Improved knowledge on tree nursery establishment, tree planting and management for increased tree cover
6. Enhanced community livelihood (food security, water security, income security and better health care).

Five-year vision

A more sustainable 'green' environment for a secure community and livelihood

The dryland woodland community of Kitui identified the main challenges to achieving their desired outcome and shared vision as: (i) inadequate knowledge of tree nursery establishment, tree harvesting and management practices; (ii) poor design and maintenance of soil and water conservation structures; (iii) the high cost of modern kiln and briquette machines; (iv) limited knowledge and skills on briquette making as an alternative to charcoal; and (v) lack of a market for charcoal and alternative biomass energy sources such as briquettes.

To address these challenges, the communities across the four locations prioritized the following key interventions: (i) natural resource management such as rehabilitation of degraded areas, growing and management of trees, and water and soil management; (ii) improved charcoal production such as improved technologies, zoning areas for charcoal production, packaging, effective certification and licensing, effective and pooled pricing and marketing, and alternative biomass fuel (briquettes); and (iii) alternative sources of income, and access to savings and credit facilities (see table). These priority interventions are aimed at ensuring a shared community vision of secure livelihoods and sustainable natural resources.

Key priority interventions by four communities in Kitui County

Ranking of priority interventions by location	Endau	Nguni	Endui	Ngomeni
Alternative sources of income (livestock keeping, beekeeping, and farming)	X	X	X	X
Licensing of the charcoal trade; certified charcoal production	X	X	X	X
Improved tree harvesting techniques.	X	X		X
Value addition to the charcoal produced (packaging, labelling)		X		
Establishment/creation of charcoal markets and storage/collection structures for charcoal bulking, and negotiation for better prices and security	X	X		X
Rehabilitation of degraded lands, land management, establishment of tree nurseries and tree planting activities, agroforestry, zoning of charcoal production areas	X	X	X	X
Improved access to funds, formation of saving and loans schemes and/or banking cooperatives, development of financial management skills	X	X	X	X
Improved charcoal production through better tree management, improved kilns, and better management of production sites for vegetation regrowth	X		X	X
Water harvesting technologies	X	X	X	
Briquette production		X		

(X)- Priority interventions selected by community members in each location.

Stakeholder story

Knowledge can spread as fast as *Prosopis*



Born and raised in Marigat subcounty, Baringo County, 26-year-old Mike Sikamoi has helped over 100 members of his community to produce higher-quality charcoal more efficiently.

Since his participation in a training of trainers (ToT) on the use of improved kilns, he has shared his knowledge and experience with other charcoal producers, who have in turn taken up and shared this approach to a more sustainable charcoal value chain.

As a pastoralist and charcoal producer, he was all too aware of the challenges posed by the invasive *Prosopis juliflora* bush for his livestock and community. Since his participation in the GML sustainable woodfuel project, he now sees the potential to profit from the plant while controlling its spread.

“The training showed us how to live with *Prosopis* – because it can’t be eradicated,” he said. “We can control it by using it in a very productive way through improved charcoal production.”

Mike and other trainers learned how to use three new methods: improved earth kilns (IEK), drum kilns and Casamance kilns. They found that the IEK and drum kilns had a better output and produced larger, stronger pieces of charcoal than the traditional kilns, and these fetched a higher price at the market – on average 500 shillings per bag compared to 400 shillings for traditional charcoal.

“Buyers know by the size, weight and texture of the charcoal whether it was produced by a traditional kiln or IEK,” he said. “People prefer the IEK after seeing its advantage over the TEK.” He also noted the health benefits of using the IEK, as it produced much less smoke than the older, more wasteful method.

The ban on charcoal production in Kenya has negatively affected families who depend on charcoal to buy food and pay school fees, as well as for daily household use. While some innovative people began to carve out new livelihood options by making chairs out of *Prosopis* branches, many others are hoping for an exemption on *Prosopis* charcoal from the current logging moratorium, so they can further develop the market for higher-quality, more sustainable charcoal.

“The training showed us how to live with *Prosopis* – because it can’t be eradicated”

Cost of conducting community action planning meetings in Kenya

The CAP meetings were conducted at the grassroots (location) level and at a central place that was easily accessible to community representatives from all the villages in the location. Cost was a deciding factor in the choice of meeting locations to ensure that transportation costs and accommodation were low, to ensure participants, especially women, could attend to their household responsibilities. The CAP meetings incurred costs of around 13 USD per person per day both in Baringo and Kitui counties, covering participants' two-way transport, breakfast and lunch, training supplies (pens, notebooks, and flipcharts), seating and rental of meeting hall. These costs may vary with the geographical location or country, meeting venue and incentives/provisions required for seamless community engagement.



CPA meeting in a farm near Endui, Kitui County, Kenya
(Axel Fassio/CIFOR-ICRAF)

Community action planning for sustainable woodfuel production
in Baringo and Kitui counties, Kenya

Training of trainers in Baringo

Improved and sustainable *Prosopis* charcoal production was identified as one of the priority interventions during the CAP in Baringo. The project implemented three main activities:

1. Twenty-four local charcoal producers and one primary school teacher participated in a training of trainers (ToTs) on more efficient carbonization technologies, management of *Prosopis* thickets into woodlots, and use of *Prosopis* twigs for briquette making and as biochar for soil improvement (Njenga et al. 2019).
2. Community ToT graduates facilitated peer-to-peer learning by training more than 359 other charcoal producers on charcoal production using the improved earth mound kiln and the drum kiln. Charcoal producers supported by the project in the use of the IEK reported higher yields, heavier charcoal, faster carbonization and less waste in form of dust and smoke compared to the traditional earth mound kiln.
3. A meeting with the Baringo County government's environment committee was held to discuss governance issues, and a draft county roadmap was developed to guide the development of a sustainable *Prosopis* woodfuel value chain in the county. The roadmap will include policy reforms to formalize the value chain, as well as increased support for natural resources management, including woodfuel resources. This will benefit vulnerable charcoal producers who are often exploited by unlicensed agents along the charcoal value chain.

Increasing tree cover was a key aim in Kitui County. To meet this need, 90 representatives of charcoal producer groups (CPG) comprising 62 women and 28 men from four locations were trained in the establishment of tree nurseries, farmer managed natural regeneration (FMNR), enrichment planting, efficient carbonization technologies and briquette production. This led to the establishment of 10 tree nurseries, which grew a total of 11,200 indigenous tree seedlings. In addition, 4,000 mixed tree seedlings of exotic and indigenous origin were raised by individual farmers. The main tree species grown in the tree nurseries and by individual farmers include: *Terminalia pruinodes*, *Acacia horrida*, *Cassia abbreviata*, *Senna siamea*, *Tamarindus indica*, *Melia volkensii*, *Moringa oleifera*, *Azadirachta indica*, *Mangifera indica* and *Persea americana*.

Organizational and institutional capacity development of CPAs and CPGs, particularly in business and marketing skills, was initiated in Endui, Nguni, Ngomeni and Endau locations in Kitui County. This was aimed at empowering members of the CPGs and CPAs to work well together in their organizations for effective natural resource management and sustainable charcoal production. In addition, two new CPGs were established in Ngomeni and Nguni locations in Kitui County. Organizing charcoal producers in groups provides community-level platforms that are useful in facilitating engagement and shared learning among local stakeholders for policy change and increased impacts on the ground. These community-level platforms have also raised awareness on the available legislation around sustainable charcoal production, and have initiated dialogue to influence policy change.

Despite progress, challenges remain at both sites. These include:

- Limited access to markets and restrictions on the number of bags produced and transported under the current '3 bag rule' of the logging moratorium. This disincentivized charcoal producers in these sites and particularly affected the uptake of piloted options on *Prosopis* management practices and more efficient charcoal production technologies.
- Flooding caused by rising water levels in the Baringo and Bogoria lakes, causing the displacement of target communities and submergence of demonstration plots for *Prosopis* management that were set up by trained charcoal producers. This slowed the transfer of knowledge to the rest of the community members.
- The effects of the logging moratorium on the livelihoods of charcoal producers and traders persist.
- There is a lack of market for briquettes promoted in Kitui County as an alternative energy source to charcoal.

Conclusion and recommendations

At a cost of around 13 USD per person per day, depending on location, CAP meetings offer a low-cost, effective approach to promoting sustainable charcoal production systems and trade. Thus, with limited funding, county governments through their relevant departments could integrate the facilitation of CAP into their activities. Building capacity among community trainers on the CAP process would further enable CPAs to steer their own CAP meetings at minimum cost (i.e., only for facilitation) using the revenues collected from charcoal trade.

There is a need for continued implementation of the prioritized options in natural resource management and efficient charcoal production technologies, as well as facilitation by development practitioners in collaboration with government bodies to promote more effective marketing systems, for enhanced income and environmental sustainability (Kamwilu et al. 2021). For instance, relevant county and national governments ministries and development partners could integrate these activities into their plans, programmes and training materials on improved charcoal and FMNR (Wanjira et al. 2020; Wanjira et al. 2021). CPAs, through their developed action plans or environmental conservation plans, can allocate funds from charcoal revenues to implement some of the activities, as recommended in the Charcoal (Forestry) Rules 2009 for Kenya.

Promoting diversified woodfuel products such charcoal dust recovery at processing sites and use of tree branches and twigs for production of small pieces of charcoal for briquette production could reduce pressure on forests and trees by providing an additional marketable product for charcoal producers. However, they require support to establish linkages with briquette traders and users for effective marketing.

Finally, the strengthening of organizational capacity is critical to ensure adherence to policy requirements for sustainable woodfuel production. To achieve this, the Kenya Forest Service and the relevant departments of county governments can work together with CPAs to ensure that much-needed capacity is built or strengthened.



Prosopis invasion on farmland near Ngambo, Baringo County, Kenya
(Axel Fassio/CIFOR-ICRAF)

References

Burrow E, Mogaka H. 2007. Kenya's drylands: Wastelands or an undervalued national economic resource. Nairobi: IUCN - The World Conservation Union, Eastern Africa Regional Office.

Kamwilu E, Duguma LA, Orero L. 2021. The potentials and challenges of achieving sustainability through charcoal producer associations in Kenya: A missed opportunity? *Sustainability* 13(4):2288.

Kendagor AK, Prevost RJ. 2013. Energy diversity and development in Kenya. *Joint Force Quarterly* 70 (3):94–97.

Kipsisei GC. 2011. *Environmental degradation and social conflict in Trans Mara District, South Rift Valley of Kenya*. [Master's Thesis]. University of Nairobi. <http://erepository.uonbi.ac.ke/handle/11295/4483>

Koech G, Sola P, Wanjira EO, Kirimi M, Rotich H, Njenga M. 2021. Charcoal production from invasive *Prosopis juliflora* in Baringo County, Kenya. Brief #4. Sustainable Woodfuel Brief Series. Governing Multifunctional Landscapes Project. Bogor, Indonesia and Nairobi, Kenya: CIFOR-ICRAF.

Maundu P, Kibet S, Morimoto Y, Imbumi M, Adeka R. 2009. Impact of *Prosopis juliflora* on Kenya's semi-arid and arid ecosystems and local livelihoods. *Biodiversity*. 10(2–3):33–50.

Mbaabu PR, Ng WT, Schaffner U, Gichaba M, Olago D, Choge S, Eckert S. 2019 Spatial evolution of *Prosopis* invasion and its effects on LULC and livelihoods in Baringo, Kenya. *Remote Sensing* 11(10):1217.

MENR (Ministry of Environment, Water and Natural Resources). 2013. Analysis of the charcoal value chain in Kenya. Nairobi: MENR.

MoEF (Ministry of Environment and Forestry). 2018. Taskforce Report on Forest Resources Management and Logging Activities in Kenya. Nairobi: MOEF.

Mwangi E, Swallow B. 2008. *Prosopis juliflora* invasion and rural livelihoods in the Lake Baringo area of Kenya. *Conservation Society* 6:130–140.

Mutimba S, Barasa M. 2005. National Charcoal Survey: Summary Report. Exploring the potential for a sustainable charcoal industry in Kenya. Nairobi: Energy for Sustainable Development Africa (ESDA).

Ndegwa G, Sola P, Iiyama M, Okeyo I, Njenga M, Siko I, Muriuki J. 2020. Charcoal value chains in Kenya: A 20-year synthesis. Working Paper Number 307. Nairobi: World Agroforestry (ICRAF).

Njenga M, Kirimi M, Koech G, Otieno E, Sola P. 2019. Training of Trainers (ToT) on sustainable *Prosopis juliflora* woodfuel production and utilization in Baringo County, Kenya. <https://www.cifor.org/gml>

Singh A, Lund G, Barr J, Kironde E, Mutegeki J, Apindi E, Giese K. 2019. Review of woodfuel biomass production and utilization in Africa: A desk study. https://www.researchgate.net/publication/334085317_Review_of_woodfuel_Biomass_Production_and_utilization_in_Africa_A_Desk_Study

Sola P, Zerfu E, Coe R, Hughes K. 2017. Community visioning and action planning: guidelines for integrating the options by context approach. Nairobi: World Agroforestry (ICRAF).

Wanjira EO, Kirimi M, Kinyua JG, Koech G, Siko I, Bourne M, Muriuki J, Sola P, Njenga M. 2021. Using improved kilns to produce charcoal in Kenya. A practical guide. Nairobi: World Agroforestry (ICRAF).

Wanjira EO, Muriuki J, Ojuok I. 2020. Farmer managed natural regeneration for Kenya: A primer for development practitioners. Nairobi: World Agroforestry (ICRAF).

Suggested citation

Wanjira EO, Kitema A, Sola P, Muriuki J, Njenga MM. 2022. Community action planning for sustainable woodfuel production in Baringo and Kitui counties, Kenya. Brief #6. Sustainable Woodfuel Brief Series. Governing Multifunctional Landscapes Project. Bogor, Indonesia and Nairobi, Kenya: CIFOR-ICRAF.

Contributing partners

Adventist Development Relief Agency (ADRA) Kenya
Kenya Forest Service (KFS)
Kenya Forestry Research Institute (KEFRI)
Charcoal Producers Federation of Kenya (CPFK)
Kitui County Government

Acknowledged contributors

Reviewers: Richard Eba'a Atyi, Jhony Zapata
Project coordination: Jolien Schure
Editing: Erin O'Connell
Graphic design: Laurent Nyssen

Photo credits

Cover: Briquettes production in Kitui town, Kitui. County, Kenya
Photo: Axel Fassio / CIFOR-ICRAF



This initiative is part of the project Governing multifunctional landscapes in Sub-Saharan Africa: Managing trade-offs between social and ecological impacts (GML), which is financed by the European Union.

This research was carried out by CIFOR-ICRAF as part of the CGIAR Research Program on Forests, Trees and Agroforestry (FTA). FTA is the world's largest research for development program to enhance the role of forests, trees and agroforestry in sustainable development and food security and to address climate change. CIFOR leads FTA in partnership with Bioversity International, CATIE, CIRAD, INBAR, ICRAF and TBI. FTA's work is supported by the CGIAR Trust Fund: cgiar.org/funders/

cifor.org/gml

