

Towards sustainable charcoal production and trade in Kitui County

Phosiso Sola¹, Mieke Bourne¹, Mary Njenga¹, Anthony Kitema², Siko Ignatius¹ and Grace Koech¹

Key messages

- Woodfuel, particularly charcoal, is an important livelihood source in Kitui County, with consumption largely in urban areas within and beyond the county, where it is still a critical energy source.
- While charcoal movement out of the county has been banned since 2018, trade has continued in some form because of inadequate support, guidance and regulation.
- While briquette production has been promoted, it has not seen substantial demand.
- Because charcoal production has continued, a sustainable charcoal value chain in Kitui County has to be explored, including i) management of woodlands and sustainable harvesting of trees, e.g. through natural regeneration and enrichment planting of trees on degraded private and public lands; ii) promotion of efficient processing and carbonization; and iii) efficient and clean cooking.
- Current institutional arrangements for guiding, supporting and controlling the value chain activities and actors can be improved to enhance the sustainability, enforcement, compliance, capacity and competitiveness of local value chains.
- World Agroforestry (ICRAF), Adventist Development Relief Agency (ADRA) and partners undertook a number of activities in Kitui County and more widely in Kenya as a whole to generate evidence, knowledge and policy options, and to facilitate engagement for more sustainable woodfuel value chains under the project entitled Governing Multifunctional Landscapes (GML) in sub-Saharan Africa launched in 2018. This brief summarises the key interventions and learnings from the project with particular focus on Kitui County.



Charcoal on the roadside in readiness for customers according to the 3-bag policy in Endau location, Kitui East Sub-County.

Photo: A. Kitema/ADRA



Briquettes at a marketing shed with no buyers.

Photo: P. Sola/World Agroforestry

¹ World Agroforestry (ICRAF)

² Adventist Development Relief Agency (ADRA)

Woodfuel situation in Kenya

Woodfuel is of critical importance for millions of households in rural and urban Kenya. Charcoal is a common and affordable form of energy in urban areas. It is used by 86% of households in Nairobi, with 43% having charcoal as their primary energy source (Ndegwa et al. forthcoming). While charcoal is important both as an energy and livelihood source, its legality has been in limbo under the logging moratorium of 2018, extended to November 2020, with a ban on movement but not on production and use. In Kitui County, the Governor issued a charcoal ban earlier in 2018, which restricted movement of charcoal out of the county. Charcoal production in the county is allowed to continue however with no licensing, support or guidance as long as it is termed local production with only 'three' bags being sold on the roadside. However, this charcoal still often finds its way to big cities such as Nairobi, just as it did prior to the ban. Charcoal production has been associated with the clearing of indigenous trees and land degradation, particularly in the arid and semi-arid regions of the country as well as with health problems of the consumers. Prior to the bans, Kitui was one of the main suppliers of charcoal to big cities such as Nairobi and Mombasa. Degradation of public forests and tree cover on private lands was of grave concern to the government. Charcoal production has continued; and yet key issues have not been adequately addressed to enable the woodfuel value chains to be more sustainable in the county.

Woodfuel governance in Kitui County

Charcoal production and trade are mostly managed under the national government forestry legislation, especially the Charcoal Rules of 2009, as echoed by 81% of the respondents during the governance and institutional assessment survey. However, with devolution in 2013, county governments have developed strategies to guide and control this value chain. Likewise, while the Kitui County had enacted the Kitui County Charcoal Management Act in 2014, implementation of the act has been challenging. One such challenge is the overlapping mandate between agencies, with many institutions perceived to be controlling, guiding and regulating woodfuel value chains. (Figure 1; Sola et al. In press).

Kitui County instituted a ban on charcoal movement out of the county in addition to the national logging moratorium; this affected commercial charcoal production despite local production on private land being permitted. To date, no movement permits have been granted, making transportation of more than three bags illegal. Furthermore woodfuel value chain governance is complicated by weak coordination and duplicity of roles among key government players in the county and other stakeholder as revealed by a social network analysis survey (Figure 2; Sola et al. In press).

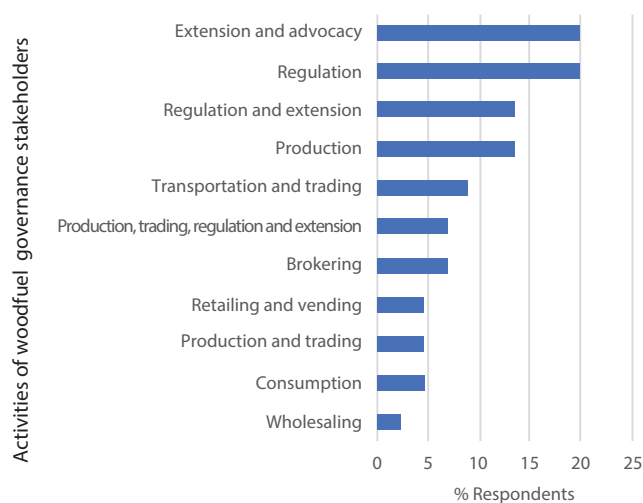


Figure 1. Institutions said to be regulating the woodfuel value chains.

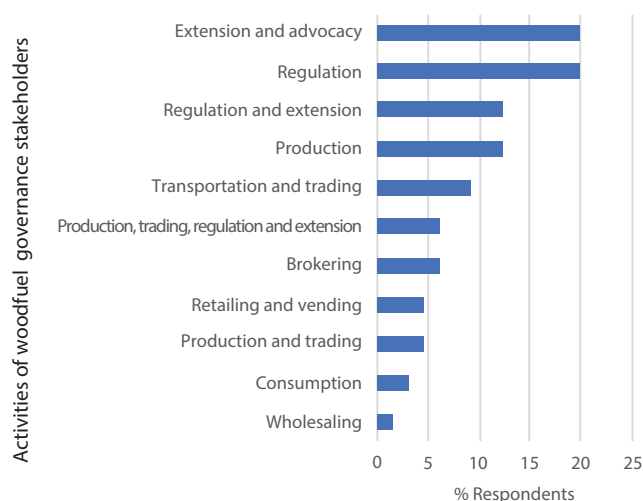


Figure 2. Roles played by various woodfuel value chain stakeholders.

Community engagement toward sustainable charcoal value chains and natural resources management

Since the launch workshop, ADRA and ICRAF have been working with communities developing community action plans and piloting interventions to support natural resources management and sustainable charcoal production. Community action planning (CAP) (Sola et al. 2016) was conducted and involved participants from across 10 charcoal hotspot wards to inform piloting and capacity development activities for both the Charcoal Producer Associations (CPAs) and community members. The CAP meetings were conducted in Ngomeni,



Kenya GML project team meeting with Charcoal Producer Group members in Mutwagombe–Endui location, Mwingi Central Sub-County.

Photo: A. Kitema/ADRA

Table 1. Natural resources priority options/interventions in Ngomeni, Nguni, Endui and Endau sublocations.

Options	Overall priority rank
Promote charcoal production technologies	1
Boreholes	2
Formation of CPAs	2
Earth dams/ Earth pans	4
Tree planting	4
Sand dams	6
Charcoal market creation	6
Natural tree regeneration	6
Tree planting and nursery establishment	6

Nguni, Endui and Endau locations and covered several sublocations. A total of 466 community members were involved in Kitui, with 66 actively engaged in the development of the CAPs (37 women and 29 men) representing the four locations.

Promotion of charcoal production technologies and CPA formation were some of the top priorities across the four sublocations. The remaining priority interventions were related to water harvesting and buffering structures, given the areas are very dry (Table 1). However, the priorities varied by location and gender.

Building on the community action plans, charcoal producer groups in Mwingi Central and East subcounties formed tree growers’ associations. The groups identified and set aside land on their farms for farmer-managed natural regeneration (FMNR) and enrichment planting. One hundred and fifty people from Endui, Nguni, Mutwangombe and Mbuvi locations were



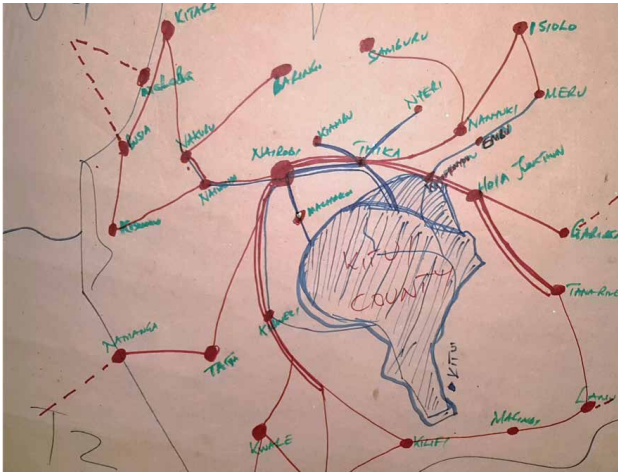
Practical learning sessions around tree planting and nursery establishment in Endui location, Mwingi Central.

Photo: A. Kitema/ADRA

trained in tree nursery management, tree seedbed establishment, tree planting techniques and tree management. In addition, the community was encouraged to form tree growers associations and to attend introductory training sessions on FMNR, enrichment planting, efficient carbonization technologies and briquette production. Eleven CPAs were identified and engaged in the charcoal production hotspot areas: four from Mwingi North and Central and seven from Kitui Rural, East and South. A total of 200 charcoal producer group members have participated in awareness meetings in Endau, Endui, Ngomeni and Nguni locations. Discussion with the charcoal producers showed that the two main challenges that they faced were poor management of natural resources leading to degradation and lack of knowledge about modern technologies for charcoal production.

Charcoal production and trade in Kitui County following the ban

During a stakeholder engagement workshop in June 2018, participants highlighted charcoal production hotspots such as Kora, Endui, Nuo, Mutito, Mutha and Nzoani, which mostly border onto Tana River County. It was noted that the volumes of charcoal being transported had reduced by 35–40% compared with the pre-ban volumes. While the overall cost of charcoal for consumers had gone up as a result, producers were receiving lower prices due to the movement risks faced by the transporters. Before the ban, charcoal from Kitui was transported to markets in Embu, Meru, Thika, Kiambu, Nyeri, Machakos, Kibwezi, Nairobi, Naivasha and Nakuru.



Charcoal trade from Kitui County before (red lines) and after the ban (blue lines).

A field visit in February 2019 to the Mbuvu sublocation near Mwingi in Kitui County revealed that charcoal producers were still working, guided by the 'three-bag policy'. They sourced trees from their own farms, but with reduced production, and sold small quantities locally and on roadsides. Following the ban on charcoal trade out of the county, Kitui County Government

had promoted the production of briquettes using charcoal residues. However, a stakeholder survey in June 2018 found that while the majority of respondents engaged with charcoal, only a limited number engaged with briquettes and a lack of demand and market were the main challenges.

The woodfuel value chain survey indicated that 92% of the households producing charcoal sourced wood from their own farms and 70% of landowners did not apply any tree management practices. Most of the trees harvested for charcoal production were reported to be from woodlands (58%), grazing land (23.5%) and cropland (17%). About 64% of the producers stated that their preferred tree species for charcoal were scarce. Furthermore, 19% of the respondents reported that their preferred tree species were completely absent from their land. The most preferred tree species for charcoal were *Acacia tortilis* and *Terminalia prunioides* as indicated by 64% and 53% of the producers, respectively. Other tree species used included *Acacia gerrardii*, *Delonix elata* and *Acacia elatior*. These preferences were driven by charcoal quality and customer preference. Almost all (97%) households involved in charcoal production used traditional earth mound kilns. Improvements in the nature, processes and technologies employed during production are crucial to ensure that trees are not cut down unnecessarily (Figure 3; Ndegwa et al. forthcoming).

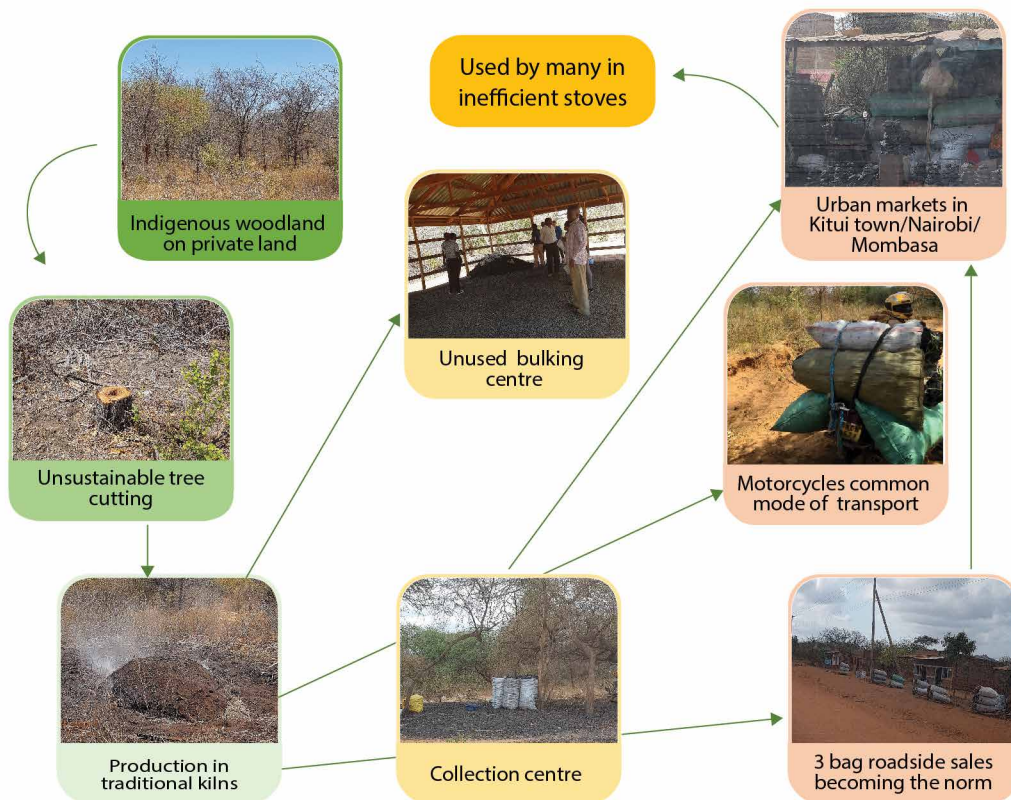


Figure 3. Charcoal production to trade during the ban in Kitui and beyond.
Photos: P. Sola/World Agroforestry and A. Kitema/ADRA

Impacts of the charcoal ban in Kitui

The ban has resulted in both intended and unintended outcomes. It was reported that the ban has resulted in night-time tree harvesting and charcoal burning. While transportation of charcoal within the production sites is legal, outside the county it is illegal. To navigate this restriction, transporters used motorbikes to transport 2–3 bags of charcoal to a certain location at the border, which were then loaded into other vehicles. In addition, several other consequences have resulted from the ban, including loss of household income, school dropouts and crime (Figure 4).

Charcoal production is a livelihood source for many in Kitui (43% of survey respondents), contributing 14% of household income, which may have been even higher before the moratorium of February 2018 (Ndegwa et al. forthcoming). Producers want charcoal prices to increase, and formalized systems to be instituted for greater benefits from the charcoal trade. Producers suggest several key interventions to improve the industry: i) increase in charcoal prices, ii) formation of CPAs, (iii) provision of support and extension services such as training on improved technology, and (iv) access to loans and seedlings (Figure 5).

Kitui–Nairobi charcoal value chain

Income and profit in the charcoal value chain between Kitui and Nairobi were concentrated in the center of the value chain. The transporters' gross margin accounted for the largest share of the final profit at 52% when charcoal is sold in bags or 43% when it is sold in tins, while producers only realized gross margins of 16% (Figure 6). The transporters also had the largest net income per bag of KES 710 while producers made KES 239 per bag. Even then, this was still a significant livelihood portion of the household income for producers. In Kitui, about 64% of charcoal producers were men, indicating low involvement of women. Women were less involved in the trade of charcoal in Kenya overall but were engaged again at the retail end of the chain.

Opportunities for a sustainable woodfuel value chain in Kitui County

Charcoal remains an important energy, livelihood and income source in Kenya in general and in Kitui in particular. Thus, there is a need to invest in making woodfuel value chains green, sustainable and competitive.

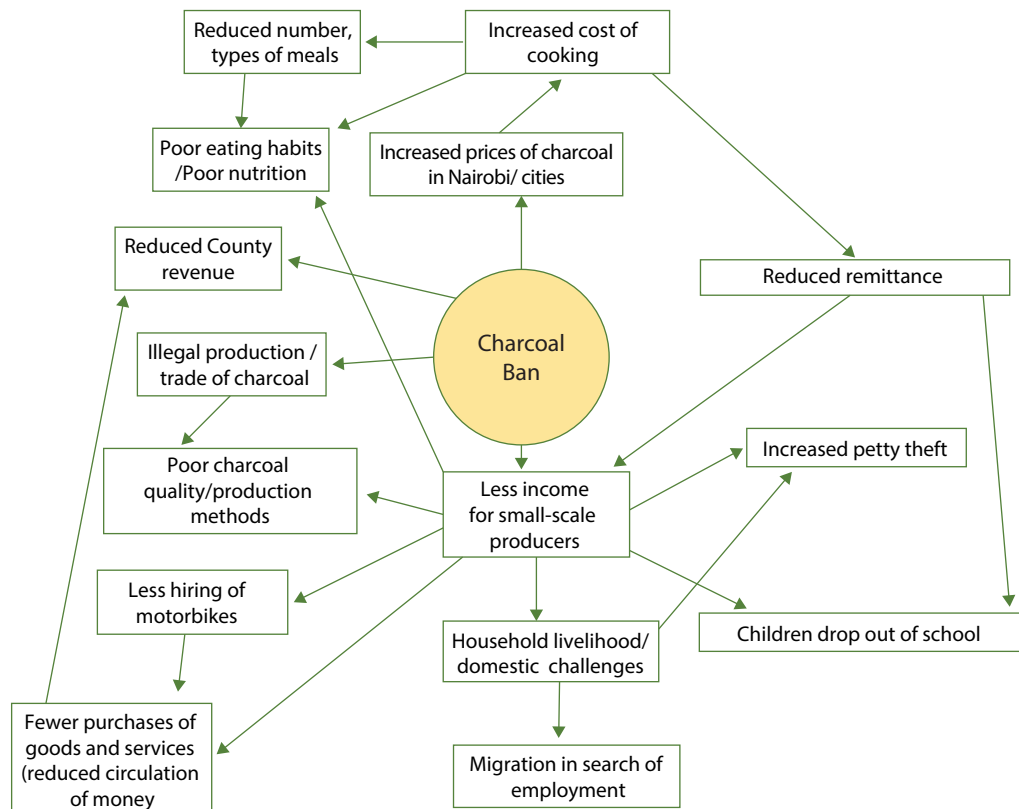


Figure 4. Schematic representation of cause–effect impacts of the charcoal ban in Kitui as reported by the community during field visits.

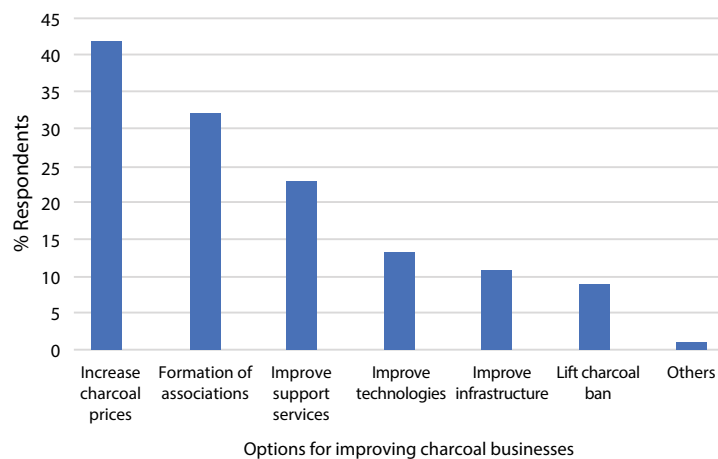
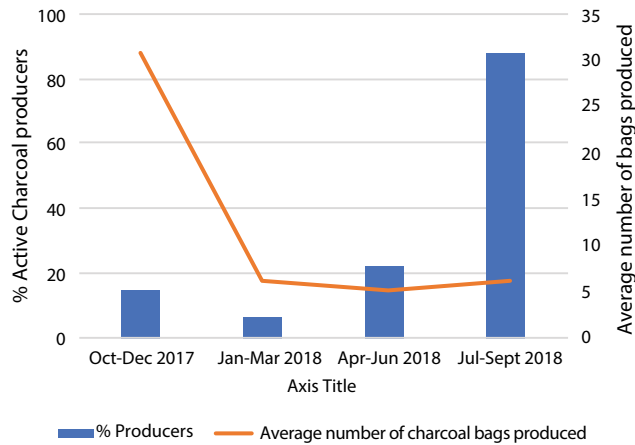
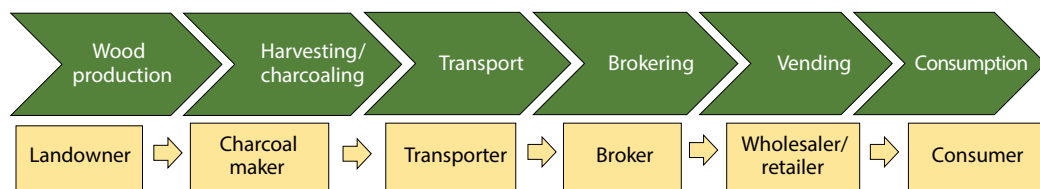


Figure 5. Above: Charcoal production levels in 2017 and 2018. Below: Options for improving charcoal advanced by value chain actors.

Baringo-Nairobi



Buying price (KES)	0	423	1500	2050	2300	(2773) *
Expenses (KES)	0	105	464	0	143 (154)	
Gross margin (KES)	0	423	1077	550	250 (723)	
Gross margin share %	0	18% (15%)	47% (39%)	24% (20%)	1% (26%)	
Net income (KES)	0	318	613	550	107 (569)	

*values when charcoal is sold in tins are presented in brackets

Figure 6. Schematic representation of Kitui-Nairobi charcoal value chain with prices per bag.

Build capacity of community and CPAs to manage natural resources

1. Educate communities on the importance of managing and protecting natural resources.
2. Train CPAs and communities in tree planting, sustainable tree harvesting techniques, farmer-managed natural regeneration (FMNR) and more efficient charcoal production techniques.
3. Support CPAs to develop conservation plans to ensure net gains in tree cover.

Planned forest policy and review of the Charcoal Act

4. Kitui County has just completed setting up a Climate Change Fund and would like to give more focus to forestry by developing a forestry policy and subsequently reviewing the current Charcoal Act; this offers an opportunity to develop a road map towards sustainable woodfuel value chains.
5. Signing of transitional implementation plans (TIPs) to streamline roles and responsibilities between national and county governments, and could improve support and regulation of the charcoal value chain.
6. Wider stakeholder engagement in co-designing the road map for a sustainable woodfuel value chain development in Kitui County remains crucial.

Acknowledgments

This project is implemented with the generous support of the European Union through the Governing Multifunctional Landscapes (GML) in sub-Saharan Africa project, implemented by the Center for International Forestry Research (CIFOR) in partnership with World Agroforestry (ICRAF), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Forest and Farm Facility (FFF), the Food and Agriculture Organization of the United Nations (FAO), and national and local organizations. We are also grateful for the support received from the CGIAR Program on Forests, Trees and Agroforestry (FTA) and Water Land and Ecosystems (WLE) - Sustaining Rural-Urban Linkages.

References

- Ndegwa G, Sola P, Siko I, Kirimi M, Wanjira EO, Koech G and Iiyama M. 2020. *Woodfuel value chain in Kenya*.
- Sola P, Bourne P, Okeyo I and Siko I. 2020. *Governance of woodfuel value chains in Kenya: An analysis of policies, legislative frameworks and institutional mechanisms*.
- Sola P, Zerfu E, Coe R and Hughes K. 2016. *Community visioning and action planning: guidelines for integrating the options by context approach*. Nairobi, Kenya: World Agroforestry (ICRAF).



RESEARCH
PROGRAM ON
Forests, Trees and
Agroforestry

This research was carried out by CIFOR 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/



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems

cifor.org/gml

forestsnews.cifor.org



Center for International Forestry Research (CIFOR)

CIFOR advances human well-being, equity and environmental integrity by conducting innovative research, developing partners' capacity, and actively engaging in dialogue with all stakeholders to inform policies and practices that affect forests and people. CIFOR is a CGIAR Research Center, and leads the CGIAR Research Program on Forests, Trees and Agroforestry (FTA). Our headquarters are in Bogor, Indonesia, with offices in Nairobi, Kenya; Yaounde, Cameroon; Lima, Peru and Bonn, Germany.

