

# brief

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## Woodfuel for urban centres in the Democratic Republic of Congo

### The number one energy and forest product returns to the policy agenda

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#### Key points

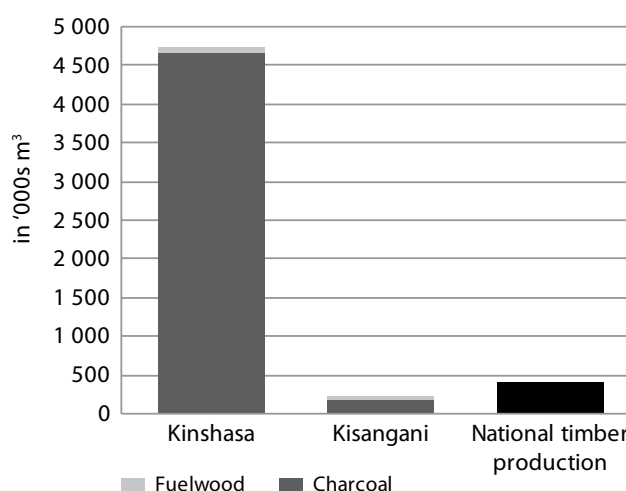
- Policymakers should recognise the size and value of the woodfuel sector and its importance to many people.
- Harvesters and producers need better access to trees and land to promote better management and reduce conflicts.
- The tax system for woodfuel should be revised to be transparent and pragmatic.
- Woodfuel from plantation forests and agroforestry should be favoured over woodfuel from valuable or threatened tree species.
- More attention should be paid to energy-efficient charcoal kilns and cooking stoves, as well as activities to promote their use.
- Management options that combine agroforestry, plantations and improving energy efficiency need collaboration from different sectors: energy, forest, land-use planning and agriculture.

#### The diverse woodfuel sector

For tropical humid forests, such as those of the Congo Basin, it has long been assumed that woodfuel<sup>1</sup> is abundant and merely a by-product of timber exploitation or agriculture. However, recent observations in DR Congo, Republic of Congo, Central African Republic and Cameroon show diverse production patterns, as well as an increase in urban demand and a shift from consumption of fuelwood to charcoal. Growing demand for urban woodfuel has increased pressure on the region's forest resources, which is especially problematic in the absence of incentives to restore or manage these resources sustainably. However, it has also created possibilities for

many local people to gain an income from woodfuel production and trade.

The woodfuel sector in the Congo Basin is mainly informal and few data are available. The DR Congo, where abundant forest resources cover roughly 155.5 million hectares (Eba'a Atyi and Bayol 2009), is among the poorest countries in the world. It ranks 168th out of 169 on the 2010 Human Development Index (UNDP 2011). The Makala Project<sup>2</sup> aims to enhance understanding and management of the woodfuel sector for urban centres in the DR Congo. It contrasts woodfuel supply zones from savannahs and degraded forests near Kinshasa with a



**Figure 1. Woodfuel traded in Kinshasa and Kisangani and official national timber production (m<sup>3</sup> in 2010)**

Note: This is the official timber production figure from the International Tropical Timber Organization (ITTO) 2011. However, statistics about formal wood production vary largely from one source to the other and the larger informal timber sector has not yet been taken into account.

region copiously endowed with still undisturbed tropical humid forest near Kisangani. This brief<sup>3</sup> provides key data on the woodfuel sector and recommendations for improved management.

## Growing demand in urban centres

Woodfuel consumption in DR Congo's urban centres is increasing thanks to a growing population and a lack of alternative energy sources. Households depend largely on woodfuel for daily cooking (87% in Kinshasa and 95% in Kisangani). Businesses, such as bakeries, breweries, restaurants, brick makers and aluminium forgers, also depend upon fuelwood or charcoal for their daily operations. The volume of the woodfuel market to the cities of Kinshasa and Kisangani alone (4.9 million m<sup>3</sup>) exceeds the volume of official national timber production (400 000 m<sup>3</sup> (ITTO 2011)) by more than 12 times. In Kinshasa, the country's capital city with around 6 million inhabitants<sup>4</sup>, the total charcoal market value was estimated at US \$143 million in 2010; this represented 3.1 times the value of the country's national timber export (\$46 million in 2010 (FAO 2011)).

The woodfuel supply zone of Kinshasa stretches to the southwest and northeast over an average distance of 102 km for fuelwood and 135 km for charcoal (Figure 2). The provinces of Kinshasa and Bas-Congo provide most of the woodfuel (43% and 34% respectively) and the rest (23%) enters via the Congo River from the provinces of Bandundu, Equateur and Orientale up to 1000 km away. Kisangani, the

capital of Orientale, is supplied via six main routes (river and road) from an average distance of 25 km for fuelwood and 37 km for charcoal (Figure 3).

The woodfuel sector provides a significant number of jobs in the informal sector. While 15 000 are employed in the formal forestry sector (Eba'a Atyi and Bayol 2009), more than 300 000 are involved in informal woodfuel production for Kinshasa alone. Most cash-generating opportunities exist at the level of production where woodfuel income contributes considerably to average household income (ranging from 12% for fuelwood harvesters around Kisangani to 75% for charcoal producers around Kinshasa). Woodfuel income provides households with capital to invest in other activities (mainly in agriculture and some in petty trade, livestock and fishing). Overall, however, the income of producers remains low with over half earning less than US \$50 a month, reflecting the country's high poverty levels.

## Less supply, less access

For the DR Congo, unsustainable practices and deforestation are mainly observed in peri-urban areas, savannah zones and around protected areas (Schure *et al.* in press). Two-thirds of the woodfuel produced for Kinshasa and Kisangani originates from slash-and-burn agriculture, while around one-third comes from forests (generally degraded forest along rivers in the regions of Kinshasa and primary forests around Kisangani). Environmental costs are not internalised and producers rarely replant trees. Demand is surpassing supply for Kinshasa's rapidly depleting peri-urban forests.

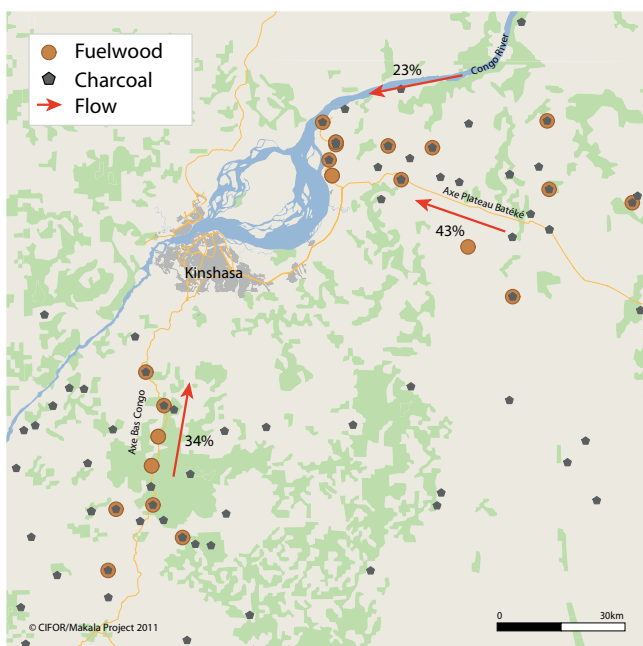


Figure 2. Woodfuel flow in the Kinshasa supply zone

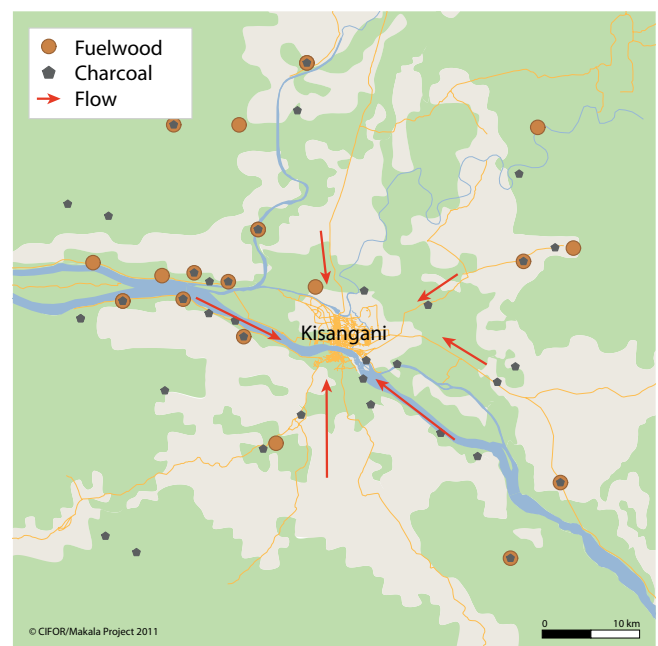


Figure 3. Woodfuel flow in the Kisangani supply zone

Distances to the resource are increasing and accompanied problems, such as conflicts about access to trees, are common. Unlike Kinshasa, where every available tree is used, there tends to be more selection around Kisangani, which leads to degradation of preferred tree sources. Among the various species used for woodfuel production, major timber and non-timber forest products are commonly used. There is little information on the conservation status of most of these species. For example, the International Union for Conservation of Nature (IUCN) Red List, a comprehensive inventory of the global conservation status of plant and animal species, has only assessed a few woodfuel species (IUCN 2011). Of these, some face risk of becoming endangered in the future such as *Milicia excelsa*, *Pterocarpus angolensis* and *Irvingia gabonensis*, while two species – *Millettia laurentii* and *Autranella congolensis* – have been assessed as endangered and critically endangered respectively.

Regulatory frameworks for the woodfuel sector exist in the forestry code and land tenure law. Possible legal options for managing woodfuel production are: (1) public plantations; (2) private plantations; (3) reforestation of agricultural parcels; (4) woodfuel exploitation with a permit for woodfuel cutting and carbonisation; and (5) rural community forests.

In practice, most wood is sourced from (newly slashed) agriculture land and (degraded) forests; the few woodfuel plantations that exist include the Mampu Project at the plateau Batéké with production of charcoal from 8000 ha of acacia trees (*Acacia auriculiformis*), the neighbouring reforestation project village Ibi with related charcoal production under the Clean Development Mechanism and the EcoMakala Project in North Kivu. Reforestation to date is insignificant; despite the higher targets set by the National Forest Fund (500 ha per year from 1986 to 2006, recently raised to a target of 1000 ha per year per province), only 4787 ha were planted between 1986 and 2006<sup>5</sup>. The permit system for woodfuel does not capture the nature of rural production far from Kinshasa. Figures from the urban division of the Ministry of Environment of Tshiangu (Kinshasa) show a lack of implementation; only 19 permits, for a total of 910 tonnes of charcoal, were issued in 2009<sup>6</sup>, which represents less than 1% of Kinshasa's charcoal market.

The current weak implementation of woodfuel sector regulations contrasts with the customary rules that largely govern access to wood. Only 3.5% of producers own an official forest concession. Access is commonly through customary land rights, by renting land or by buying trees

from the landowner or village chief. Any intervention in the woodfuel sector needs to take the strong role of traditional local authorities into account.

## Recommendations

Given increasing demand for woodfuel and a lack of alternative energies in the short term, the Congolese government needs to immediately improve management of the sector, in collaboration with stakeholders. The national Reducing Emissions from Deforestation and Degradation (REDD) programme creates momentum for this, as its recently endorsed Forest Investment Programme (FIP)<sup>7</sup> grant an important place to potential production and consumption benefits to be gained in the woodfuel sector. Future interventions need to consider the dependence of many people on woodfuel production and the importance of sales as a cash-generating activity. These activities are mostly still in the informal sphere and collaboration among different sectors – energy, forest, land-use planning and agriculture – is necessary to professionalise and formalise, without harming the livelihoods of those involved. New management options that combine agroforestry, plantations and improving energy efficiency at producer and consumer levels can provide opportunities to guarantee sustainable future energy supplies, while maintaining the natural resource base.

At the level of production:

1. Recognise the importance of the sector in providing revenues to a large number of people.
2. Improve the energy efficiency of charcoal kilns (both production skills and technology).
3. Raise awareness about protecting valuable and threatened species.
4. Replant trees (for multiple uses) in plantation and agroforestry systems.
5. Improve the rights of harvesters and producers to access trees and land to promote better management and reduce conflicts.
6. Improve transparency on tax payments and target informal tax payments that drive up production costs.

At the level of sales and consumption:

1. Promote woodfuel from plantation forests and avoid woodfuel from valuable or threatened tree species.
2. Recognise the importance of woodfuel as the primary source of households' cooking energy and as an important source of energy for businesses and industries.

3. Revisit the low level of adoption of energy-efficient cooking stoves and support activities to promote their use.
4. Support access to alternative energy (such as gas, electricity and small-scale bioenergy).
7. DR Congo's Forest Investment Programme (FIP) (Ministry of Environment, Nature Conservation and Tourism) was endorsed at the FIP subcommittee meeting in June 2011.

## Notes

1. Woodfuel refers to all types of biofuels originating from woody biomass. Fuelwood is woodfuel in which the original composition of the wood is preserved, including wood in the raw and residues from wood-processing industries. Charcoal is the solid residue derived from carbonisation, distillation, pyrolysis and torrefaction of fuelwood. These definitions follow the Unified Bioenergy Terminology (UBET) published by the Food and Agriculture Organization (FAO) in 2004.
2. The Makala Project (2009–2013) is coordinated by Agricultural Research for Development (CIRAD) in partnership with CIFOR, the Hanns Seidel Foundation, Gembloux Agro-Bio Tech and the Faculty of Science at the University of Kisangani. The content of this work is the sole responsibility of the authors and can in no way be taken to reflect the views of the European Union, which financially supports the Makala Project.
3. This brief, a collaboration between CIFOR and CIRAD within the Makala Project, presents key data from field research conducted from 2009 to 2011.
4. Estimates about the population of Kinshasa differ largely from one source to another. This study took the recent census data generated by the urban division of the Ministry of the Interior, Decentralisation and Security (2010), which counted 5.8 million inhabitants.
5. Directorate of Reforestation and Horticulture of the Ministry of Environment, personal communication, Kinshasa, August 2009.
6. Urban Division of the Ministry of Environment in Tshiangu (Kinshasa), personal communication, Kinshasa, April 2010.

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