# Improved supply chain for biomass energy (charcoal and fuel wood), and access to non-biomass energy alternatives

## Overview

The demand for fuel wood is growing in line with the population. The current supply chain of fuel wood and charcoal gives rise to deforestation, forest degradation and resource wastage, which ultimately increases the price of biomass energy. At the national level there are institutional conflicts as policy and institutional mandates are not integrated, leading to inadequate political will to provide incentives for creating wood lots or cleaner household energy supplies. At the subnational level there are underdeveloped value chains for both fuel wood and non-biomass alternatives, therefore the provision of sustainable wood fuel and charcoal through tree planting is not economically advantageous to the local growers. At the local level, cultural beliefs may limit substitution to cleaner alternatives and there may in fact be limited awareness of available options; and the limited availability of affordable technologies and/or cleaner alternatives (e.g. cook stoves, solar) means energy substitution is not a viable solution to the local population.

## Actions to maintain and/or enhance the benefit:

1. Promoting sustainable enterprises along the fuel wood and charcoal value chains, namely in the development of fuel wood plantations and the supply for biomass energy to markets;
2. Appropriate targeting and raising awareness at the local level to efficient energy use, sustainable harvesting of fuel wood and production of charcoal and adoption of alternative energy sources;
3. Lobbying and advocacy to improve Inter-sectorial coordination, drive forward the implementation of ENR policies and enforce byelaws;
4. Increased investment in research and development of cleaner and more efficient cook stoves and non-wood fuel alternatives;
5. Improve access to credit for the production of cleaner alternatives and for local people transitioning to cleaner energy alternatives.

## Beneficiaries:

* **Households and local communities**
  + Decreased use of fuel wood and charcoal in improved cook stoves;
  + Revenue generation from fuel wood production and/or increased savings from lower fuel consumption in improved cook stoves;
  + Access to low cost alternative energy sources;
  + Improved health through use of clean energy alternatives.
* **National institutions, NGOs and civil society**
  + Researching, piloting and promoting efficient energy use and alternative energy sources
* **Private sector**
  + Reduced costs of production
  + Investment opportunities
* **Central and Local Government**
  + Legislation, enforcement, Participation, Awareness, research
  + Achievement of Government priorities/commitments in terms of maintaining forests
  + Reduced Expenditure on health;

## What needs to be understood to deliver the benefit?

1. Understanding the current value chain of fuel wood and charcoal, including mapping demand and supply and identifying employment opportunities and skills gaps within the current value chain.
2. Identification of appropriate tree species (high yield and fast growth rates) for fuel wood production and biophysically suitable areas to growing these species.
3. Economic analysis of the contribution of fuel wood and charcoal rom natural conservation forest estates and other land-uses to the GDP, and cost-benefit analysis of the provisioning and use of alternative sources of fuels/energy.
4. Mapping the availability areas for fuel wood plantations, examining competing and complementary land-uses to different tree planting options, and understanding boundary conflicts across different tenure systems.

## Maintenance of water catchments and water quality through forest conservation

## Overview

## Actions to maintain and/or enhance the benefit:

## Beneficiaries:

* **Households and local communities**
* **National institutions, NGOs and civil society**
* **Private sector**
* **Central and Local Government**

## What needs to be understood to deliver the benefit?