

REFERENCE NO.: 81098569

PROJECT NO.: 01.2457.8-007.24



**BIOMASS ENERGY
STRATEGY (BEST),
RWANDA**

Summary

June 2009

Introduction

The Ministry of Infrastructure, MININFRA, in collaboration with the Ministry of Environment and Natural Resources, MINIRENA, recently issued a Biomass Energy Strategy, prepared together with the firm MARGE and EUIE-PDF partnership financing. The results are interesting in the sense that Rwanda appears to be miles ahead of other countries in the Region or the rest of Africa in terms of sustainable supplies of wood energy. Unlike other countries, shifting cultivation has stopped and land clearing for agriculture and firewood does no longer take place. Whereas wood in other countries mainly continues to come from natural forests, in Rwanda it has come for some time now from tree plantations. These tree plantations have been planted by the Government and by farmers, mainly to earn revenue and to protect the environment. It is just a matter of time before other countries will enter into the same situation that now prevails in Rwanda.

Centenarians –if any - will remember that Kigali during the previous turn of the Century was devoided of trees, and hillsides were completely empty. Today, hillsides are covered with trees, which all have been planted. Indeed, severe deforestation problems reported in other countries do no longer occur in Rwanda: deforestation and charcoal making are no longer related, although not many people do realize this. If today there is a shortage of firewood and charcoal, this is because farmers do not plant enough trees, or because the regulatory aspects of the forestry sector should be further improved. Does that mean that there are no problems at all then?

Issues

Urban areas do not really experience charcoal and firewood shortages and the supply continues as always. Prices have risen somewhat, but the price fully incorporates the production cost of the wood, the conversion cost of the charcoal, and the transport and distribution costs of woodfuels to town. If a tighter future supply results in higher prices of firewood and charcoal, farmers are likely to be planting additional trees while some households might switch towards substitution fuels. Thus, there is a good chance that urban supply and demand are, and will be in balance. However, available data do not concur: the number of ha with plantations as found in the Forestry Inventory (2007), adjusted for the additional 38,000 ha of plantations below 0.5 ha discovered through MININFRA's 3000 random household Rural Biomass Energy Survey (2009), show that 50% of the supply is not sustainable. This is determined by multiplying the average productivity of plantations¹ with the total number of ha of such plantations. Data on both the *number of ha* and the *productivity* are uncertain, and thus the fact that there is an imbalance may not mean too much. To illustrate, SORWATHE is able to obtain a productivity of 20-30 m³ of eucalyptus wood with proper management techniques and some irrigation/fertilizer application. If the productivity were around 18 m³/ha, the present urban supply and demand would be in balance.

However, tree cutting permits and other rules that govern the harvesting and transformation of trees are still based on the assumption that wood comes from natural or public forests, and not from private plantations. As a result, farmers who earlier decided to plant trees, cannot harvest these whenever deemed appropriate; they need a permit and it remains uncertain if they obtain this. As a result, they are starting to disobey the rules and charcoal making is therefore becoming more and more an affair that cannot always bear the daylight. This has huge consequences and it was estimated that 10-20% of the trees needed for charcoal making do not really need to be cut if charcoal making were fully legal. So, to reduce supply-demand imbalances, an easy and quick measure would be to review the current legislation and publicly state that charcoal making from private plantations is a legal business. At the moment, the charcoal and firewood market has a value of \$120-150 million per year, of which 50% remains in rural areas: it is a really large source of income for rural farmers!

The supply of woodfuels in *rural areas* is a different matter altogether. Rural households appear to prefer low-grade fuels that they can gather around their homes and in the fields, free of charges. They do not use firewood and charcoal in large quantities. So at the moment, the supply and demand for wood fuels are in balance, although three negative aspects play a role: (i) residues should be ploughed back into the fields, to enrich the soils; (ii) low grade fuels do not burn well in improved stoves and cause smoke, increasing health problems; and (iii) why should rural households stick to using low grade fuels? They have started to use cell phones² and if that can be taken as a sign for modernization, then will better kitchen performance be just

¹ Productivity of 7 m³/ha per year; source: Forestry Inventory, 2007, MINIRENA/ISAR; this is extremely low by all standards.

² About 1/3 th of the survey respondents had at least one mobile phone.



around the corner. If and when they do start using higher grade fuels, the woodfuel supply and demand are likely to be quickly out of balance.

Biomass Energy Strategy

If there are problems now, they will certainly get worse once rural households move to urban areas or decide to modernize the way they cook. It is therefore necessary to intervene now, when there is still time, rather than later when the problems get worse. Hence, a biomass energy strategy is developed to deal with the above issues:

- Increase the sustainable supply of woodfuels. The result of this component is to make sure that in the future the supply of wood from non-sustainable sources stops completely and that the productivity of the sustainably managed resources is at a much higher level than today. This is expected to be done through the following activities:
 - *rehabilitation, better management and exploitation of State and District plantations;*
 - *tree planting and increasing the productivity of private small-holder tree farms; and*
 - *improvements to the regulatory framework with regards to cutting permits and taxation policy;*
 - *efficient planning of wood fuel supply management activities;*
 - *professionalizing of the charcoal value chain;*
- Increase the efficiency of energy use. The result is that less energy will be needed for cooking than today. This is expected to be done through the following activities:
 - *capacity building among equipment manufacturers and importers to make modern appliances for the use of biomass available;*
 - *develop a mechanism based on a Quality Label to promote the use of these modern appliances; and*
 - *launch a long-term publicity and awareness campaign to convince households, institutions and firms to adopt the new equipment and energy saving practices;*
- Promote the production of alternative fuels, particularly based on peat, papyrus and typha as well as biogas if and when viable, and LPG for households and institutions (once taxes have been reduced), kerosene and some electricity.
- Develop the institutional capacity of Government organizations (concerned ministries, specialized agencies, local authorities) to deal with biomass and energy in the short and medium term future on an equal footing as gas, petroleum fuels, and electricity. Clear indications of the responsibilities of each institute and ways of collaboration with others.

Importance of biomass for the national economy:

- 85% of the energy used in Rwanda is in the form of biomass (mainly for cooking, households & institutions)
- Biomass is a green, renewable fuel. In Northern countries it is now called a modern fuel (when using modern appliances) with minimal GHG emissions
- Important for Rwandan national energy security: 85% of the national energy demand is locally produced, only 15% is imported
- Big business (\$120-150 million), 5% of GDP
- Important for Rural development (50% of market value remains in rural areas)
- Actually, in terms of sustainable supply of wood, Rwanda is *far ahead* of other countries in the Region, and in Africa!

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