

# ADVANCING SUSTAINABLE BIOMASS ENERGY PRODUCTION IN UGANDA THROUGH PRACTICAL INCENTIVE MECHANISMS

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**During the National dissemination and policy engagement workshop on identification of practical incentives for advancing sustainable Biomass Energy Production within Central Forest Reserves and Forest Landscapes in Uganda.**

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# Sustainable biomass energy production within central forest reserves and forest landscapes in Uganda

- ▶ **Focus of Presentation**
- ▶ *MWE should address the biomass energy production through dedicated large scale biomass plantations in the country using species like bamboo, eucalyptus, Grevillea, Calliandra, Sesbania, Melia, Senna, since they are fast growing"*
- ▶ *MOFPED should provide the private sector with economic incentives like cheap ground rent and soft loans, performance rewards, grants to support investment in dedicated biomass energy plantations and efficient biomass energy production and use technologies."*

# Introduction

- ▶ Biomass is the main source of energy in Uganda, contributing about 94% of all energy consumed
- ▶ Of the total biomass consumed, wood fuel accounts for about 80%, charcoal 10% and crop residues 4% while firewood and crop residues are majorly consumed in rural areas while charcoal is consumed in urban areas
- ▶ The main source of wood for charcoal production in Uganda is from privately owned forests (43%), followed by central forest reserves (22), on-farm trees (20%) and others (14%)

## Introduction cont'd

- Uganda's energy balance is dominated by biomass based fuels. Firewood and charcoal contribute 88% and 6% respectively to the country's total energy consumption.
- The remaining 6% is shared by electricity, petroleum products and other sources of energy such as Solar and thermal.
- There are profound uncertainties surrounding the availability and high costs of "would be" alternative energy sources like LPG(Liquefied Petroleum Gas).
- High population dependency on biomass energy, loss of forest cover due to unsustainable harvesting of forest products, forest clearance for agriculture, urbanization, industrial development; inefficient technologies in the production and use of biomass resources resulting in more trees cut and above all the lack of dedicated and sustained investments in biomass production to replace the biomass harvested. Demand for charcoal and fuel-wood is fast increasing due to population growth, increased urbanization and the development of cottage industries in Uganda.

# Past and Current Project Interventions

- ▶ GCCA Project -Bio-energy component that aimed at establishing commercial bio-energy plantations and demonstrations as well as promoting efficient charcoal production technologies in the six cattle corridor districts of Nakaseke, Nakasongola, Luwero, Kiboga, Mubende and Sembabule. As a result, 100 hectares (ha) of Bio-energy demonstration plots and 600 hectares (ha) of subsidized private sector plantation were established (MWE, 2016).
- ▶ Similarly, Ministry of Energy and Mineral Development in partnership with Ministry of Water and Environment have been implementing a project named “*Addressing barriers to adoption of improving charcoal production technologies and Sustainable Land Management through an integrated approach*” Green Charcoal Project where a total of 6,537,000 seedlings were distributed to the pilot districts of Kiboga (1,594,800), Kiryandongo (1,395,000), Mubende (1,930,000), Nakaseke (1,325,000) and NFA (292,200) to support the establishment of bio-energy plantations. A National Charcoal Guideline and a list of candidate charcoal species was produced under this project.
- ▶ General Tree Planting Support under projects - FIEFOC, REDD+, Community Tree Planting targeting mainly indigenous (NFA); ReFOREST (UNHCR support), SPGS, Investing In Forests And Protected Areas For Climate-smart Development (IFPA-CD)
- ▶ Licensing of land in Central Forest Reserves to the Private Sector

# Lessons Learnt

- ▶ Management regimes of forests for charcoal and fuelwood production depend entirely on whether the trees are to be managed as plantations, woodlots or as natural growing rangelands or woodlands.
- ▶ Woodlots could be planted for charcoal and fuelwood production and could be managed sustainably by using selective harvesting for charcoal and fuelwood production.
- ▶ Few introduced tree species could be promoted as plantations or woodlots for charcoal/ fuelwood production in the two project areas. These could include *Eucalyptus grandis* and *Terminalia spp.*
- ▶ *Albizia coriaria*, *Milicia excelsa*, *Albizia zygia* and *Ficus natalensis*, *Combretum collinum*, *Terminalia glaucescens*, *Combretum molle* and *Albizia coriaria*.
- ▶ Both indigenous and introduced tree species suitable for charcoal should be promoted to ensure that economic values and ecological benefits are enhanced

## Lessons cont'd

- Apart from high density other characteristics of tree species which are suitable for charcoal and wood fuel production include;
  - ✓ *Grow quickly and yield a high volume of wood quickly,*
  - ✓ *Coppice or sprout well from shoots.*
  - ✓ *Dense wood with low moisture content.*
  - ✓ *High Calorific value for wood*
  - ✓ *Produce little and non-toxic smoke.*
  - ✓ *Produce wood that splits easily and can easily be transported.*
  - ✓ *Produce wood without thorns.\**
  - ✓ *Produce wood that does not spark when burning.*
  - ✓ *Require minimum management time.*
  - ✓ *Yield other products or services for the household.*

# Challenges

- ▶ Most of the charcoal production is carried out from unsustainably managed plantations. Only 41% of charcoal producers engage in full-time charcoal production and the rest being occasional producers.
- ▶ Land owners lack substantial knowledge in forest management, which casts doubt about the sustainability of wood supply. There are no systematic harvesting regimes followed as both young and old trees are cut indiscriminately. Land owners have not yet embraced fast growing tree species suitable for charcoal production as most of them are still stuck to indigenous trees that normally take long to regenerate once cut down. Thus, there is need to ensure improved wood production and proper management techniques are adequately shared with rural tree/forest planters.
- ▶ There is lack of consistency in enforcing the existing policy framework and relevant regulations. For example, wood is cut down for charcoal production without a charcoal burning permit in many areas of the country while several districts have different fees on charcoal burning permits. In some instances, charcoal is burned in central forest reserves without the knowledge of the DFS. Therefore, robust and holistic policy regulations and enforcement mechanisms need to be put in place.
- ▶ Charcoal production faces challenges and gaps which include traditional, rudimentary and inefficient charcoal production technologies that are still widely used in the burning of charcoal. While efficient charcoal production technologies exist in Uganda (see Figure 1), most charcoal burners have no knowledge of their existence and operation, hence the need for awareness creation about alternative charcoal production technologies.
- ▶ Licensing and enforcement
- ▶ Tendering and blanket application of the laws



# Existing Policy and Planning Framework

- ▶ REDD+ Strategy
- ▶ Forest Landscape Restoration
- ▶ FSC standard for Uganda
- ▶ National Forest Plan 2012/2022
- ▶ Water and Environment Refugee Response Plan, 2019
- ▶ Approach in institutional tree planting energy woodlots- Bioenergy Woodlots alongside fruit orchards, timber plantations and boundary planting

# NDP III and Forest Sector Biomass Energy considerations

- ▶ **Forest Sector Goal:** Forest resources significantly contributing to household incomes and quality of life through: Provision of forestry goods and services for livelihoods and economy; Mitigating climate change effects (reduce vulnerability of livelihoods and economy + increase resilience opportunities through provide safety nets); and forest products processing and value addition
- ▶ **Equivalent Objective No 1:** Increase economic productivity of forests and employment in the forestry sector through Forest products processing and value addition
- ▶
- ▶ **Equivalent Objective No 2:** Natural Forests and Planted Forest Stocks enhanced in quality and Productivity
- ▶
- ▶ **Equivalent Objective No. 3:** Increase the forestry incomes/revenues to national economy and livelihoods; through private sector and community led investments
- ▶
- ▶ **Equivalent Objective No. 4:** Strengthening the Private sector to drive forest sector growth
- ▶
- ▶ **Equivalent Objective No. 5:** Increase and maintain all types of forests as green infrastructure within protected forest areas through judicious public sector investments in protection, restoration and regulation

# NDPIII cont'd

- ▶ National Development Plan III. Sustainably pursue resource-led industrialization. 500 efficient charcoal kilns with conversion recovery of 40-50% operational in areas with sustainable stock feed. This will be carried out in liaison with Ministry of Energy
- ▶ 15,000ha of biofuel-wood energy woodlots established annually.
- ▶ Provision of Biomass for energy and biomass synergy use technologies.
- ▶ Natural Capital Resource Accounts. Woodfuels are already included in Uganda's GDP calculations, where they are assigned a positive value based on total demand and average price .
- ▶ With recognition, formalization and a more level playing field, investors could be attracted to introduce more modern, efficient approaches and advanced technologies for production, conversion and end-use. Those who work in the industry could be afforded legal safeguards.

# Current considerations Going Forward

- ▶ Assignment of a single central control with oversight for commercial woodfuels, to avoid current overlaps and duplication;
- ▶ Development of enforceable packaging standards for charcoal, with uniform bag weights and consistent fees;
- ▶ Expanded technical and financial support for commercial tree growing on private land, from which woodfuels are a merchantable by-product since dedicated 'energy plantations' are not commercially competitive at present;
- ▶ Greater support for industrial use of fuelwood, pellets and wood chip for thermal applications, with incentives to convert fossil fuel systems, to create a consistent market and investment incentive for sustainably sourced woodfuel;
- ▶ Development of value-added markets for sustainably produced charcoal for urban retail and for bulk consumers concerned with responsible sourcing;
- ▶ Commercial incentive packages for manufacturers and importers of high-tier cookstoves for fuelwood and charcoal that meet the minimum standards of the Uganda; and
- ▶ Measures to reduce the cost of LPG adoption and use, including credit schemes for appliances and research into pay-as-you-go LPG technology.
- ▶ Reviewing law on exports and trade based on source
- ▶ There are certain aspects along the charcoal value chain that need to be regulated so as to make the subsector more lucrative and these include; forest management, charcoal production, charcoal licensing, charcoal transportation, charcoal marketing, charcoal pricing, charcoal dust, charcoal quality, charcoal consumption and improved energy efficient cook stoves.
- ▶ Recruit Assistant Forest Officers at Sub county Level to improve extension services, enforcement and revenue collection
- ▶ Mass National Tree Planting - One Ugandan, One Tree.

**Thank You**

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the right side of the frame, creating a modern, layered effect against the white background.