



**SUSTAINABLE CHARCOAL AND WOOD ENERGY  
PRODUCTION IN AFRICA : DEVELOPMENT AND  
ENVIRONMENT IMPLICATION**

**COMPETE 2ND WORKSHOP IN MAURITIUS**

**Stephen N. Mutimba  
ENERGY FOR SUSTAINABLE DEVELOPMENT AFRICA (ESDA)**

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**Presentation structure** 

1. About ESD/A
2. General Introduction
3. Short Introduction on wood and charcoal in a few selected countries
4. Case study of Charcoal research in Kenya
5. Making charcoal sustainable
6. Why Charcoal
7. Wood energy for industry



## ABOUT ESD/A

- ESD is a world leading carbon and sustainable energy company with offices in UK, Bulgaria, China, Russia, Kenya, TZ & soon RSA & USA
- ESDA is part of ESD and is based in Nairobi. Our mission is to work with clients to **build sustainable energy infrastructure in Africa**
- ESDA was established in 1998 and became part of ESD UK in 2002
- We have a diverse client base including government, private sector, UN, WB, Donors & communities.
- We have wind, solar, biomass energy and carbon projects in East and Southern Africa



## Introduction

- Biomass fuels (fuelwood, agri-waste, dung and charcoal) dominate primary energy supply in sub-Saharan Africa.
- The use of wood energy and charcoal has impacts on biodiversity, deforestation and health
- Wood energy for industry is becoming important for fuel switching.
- Sustainable wood energy and charcoal have potential to attract carbon finance.

## Traditional Biomass in Rural Africa



- Freely available
- Land clearing
- Low calorific value
- Indoor Air Pollution
- Respiratory problems



- Not freely available,
- Relatively cheap
- Takes time to fetch
- Deforestation
- Indoor Air Pollution
- Respiratory problems

## Introduction (1)

- **In Ethiopia**, access to modern forms of energy is extremely constrained. Ethiopia Electric Power Company (EEPCO) serves predominantly urban and peri-urban population.
- Rural Ethiopians, who make up 85% of the population, rely primarily on wood, charcoal, cattle dung, and agricultural wastes as their fuel source for cooking and heating (IGADD2002)



## Introduction (2)

- **Tanzania** has abundant identified energy sources, which include; hydropower, natural gas, biomass, coal, geothermal, solar energy and wind.
- Energy consumption is dominated by biomass, which accounts for 90%, petroleum accounts for 8% and electricity accounts for 1.2 %.
- Approximately 1%) of the rural population have access to grid electricity supplied by TANESCO.
- Charcoal business in Dar alone accounts for about Tsh 200 billion (USD 200 million). (**NorConsult 2002**)



## Introduction (3)

- **In Uganda**, an estimated 4.5 million households, out of a total of about 4.7 million, remain without access to grid electricity.
- About 72% of the total grid supplied electricity is consumed by 12% of the domestic population concentrated in the Kampala, Entebbe and Jinja.
- There is large amount of wood-fuels, mainly charcoal entering Ugandan urban centers to satisfy the needs of households, tertiary, commercial and industrial sectors.
- Charcoal is worth over Ush. 58 billion to the economy (US \$ 300 million). (REDC, 2003, ERT, 2004)



#### **Introduction (4)**

- In Kenya biomass energy provides 68% of the national energy requirements.
- Petroleum fuels and electricity provide 22% and 9% respectively.
- All other forms of energy (e.g. solar, biogas, wind) put together provide 1%. (MoE 2002)
- Studies have shown that charcoal consumption in urban areas is rising



#### **Introduction (5)**

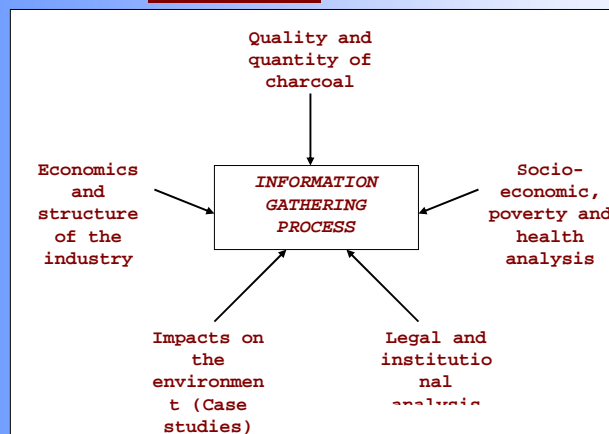
- Despite woodfuel providing most of the national energy requirements, the sector has attracted little capital investments.
- Factors such as
  - Lack of or unreliable statistics on wood energy
  - Poor understanding of the roles played by wood energy in the social and economic sectors,
  - Propaganda by Environmental NGO and Oil Industry
- Are the main causes for the insufficient attention given to wood energy in the national policies, strategies, programmes and allocation of human and financial resources

## Kenya National Charcoal Study



- Study carried out in 24 randomly selected districts
- Main objectives were:-
  - To update and analyze information on the charcoal sector
  - To heighten awareness and make public more knowledgeable on charcoal trade
  - To develop and popularize a regulatory framework, national standards and certification process for sustainable charcoal production and trade in Kenya.

### Types of Information collected



## **Main findings (1)**



- There are 200,000 producers operating in Kenya, and around half a million people (producers, transporters and vendors) involved directly in the charcoal trade who support around 2.5 million dependents.
- The amount of charcoal produced each year in Kenya is 1.6 million tones. Govt estimate is 2.4 million
- The annual income from charcoal is around Ksh. 32 billion,(USD 400 million) almost equivalent to the income generated from Kenya's tea industry.

## **Policy recommendations (1)**



- A regulatory framework should be put in place. Such a framework should:
- Outline standards and guidelines for the production of sustainable charcoal, as well as simple licensing procedures.
- Recognise charcoal associations



## **Policy recommendations (2)**

- Encourage pilot projects to demonstrate that sustainable charcoal production can be practised..
- A charcoal or wood-fuel fund or levy needs to be set up (like the Road Levy or the Rural Electrification Fund), and any money collected re-invested into the charcoal industry.
- This fund would be generated from taxation of charcoal and fines on illegal producers.



## **Making charcoal production sustainable (1)**

- Packaging and labeling of sustainable charcoal to differentiate it from illegal charcoal production.
- Allocation of land for sustainable charcoal production and space for vending.
- Addressing the unchecked harvesting of trees without replacement
- Address inefficiencies during harvesting and conversion during charcoal production .



## Making charcoal sustainable (2)

- Organize charcoal workers into associations or cooperatives.
- Training of charcoal workers to widen their skills in technical and economic issues.
- Better regulations and guidance on land-use, especially where changes in land-use are taking place

## Pilot demonstration of eco-charcoal

### SUSTAINABLE CHARCOAL

1. Set up of short rotation forestry and
- 2, modern kilns installation for sustainable charcoal



## On-going sustainable practices



- Tree farming for charcoal is slowly becoming the norm in Kenya
- New charcoal law encourages association of charcoal producers

## Hunt for efficient kilns for carbonization



## Research on sustainable Transport & Markets



## Why sustainable charcoal?



- Realization that charcoal is an intricate part of socio-cultural life, it will not go away
- Charcoal is NOT the cause of deforestation, but land use change to agriculture and settlement are main culprits
- Charcoal's potential to alleviate poverty, generate income and enhance livelihoods
- Cheaper, non renewable source of energy if harvested sustainably
- Sustainable charcoal's potential to attract carbon finance



### Woody Biofuel: Plantations for Carbon-Neutral Fuel



#### Objectives

1. Produce wood as fuel for the cement kilns to substitute fossil fuels
2. Reduce green-house gas emissions through substitution of fossil fuels
3. Sustainably utilize Bamburi's mining reserve land
4. Reduce fuel costs
5. Involve communities

#### Projected energy production

- Approx. 9% of fuel requirements of Mombasa Plant
- Energy costs estim. 20% lower than coal
- Expected to earn carbon credits from biomass fuel

#### Implementation

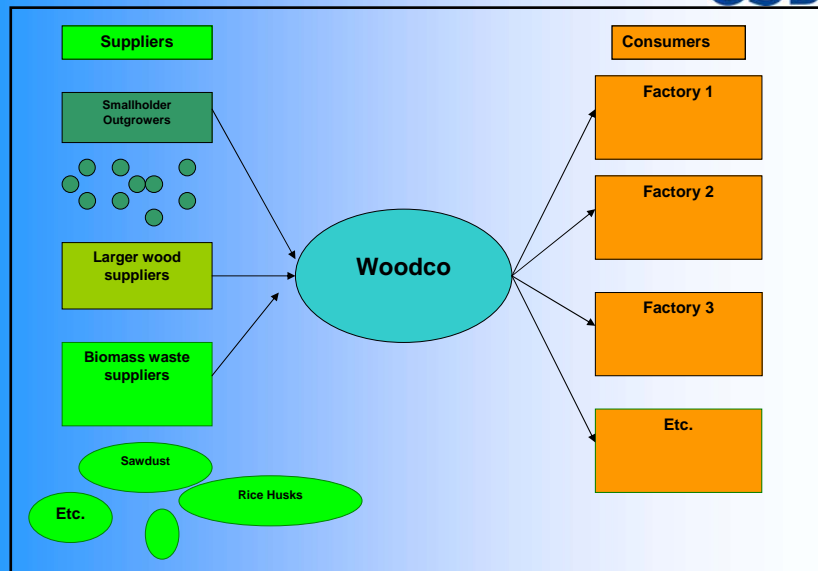
- Approx. 900ha of mining reserve land available for plantions
- Approx. 15ha new quarries available for plantations per year
- Outgrower schemes (community plantations)
- Plantations to be established over 6 years, harvesting starting from year 7



Biofuel nursery in Vipingo



### Woodco Model for the tea industry





**Thank you!**

**ESDA**

[smutimba@esda.co.ke](mailto:smutimba@esda.co.ke)

[www.esda.co.ke](http://www.esda.co.ke)

[www.esd.co.uk](http://www.esd.co.uk)

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