

Biofuels Experiences in Zambia

By

Bernadette Lubozhya



Map of Zambia

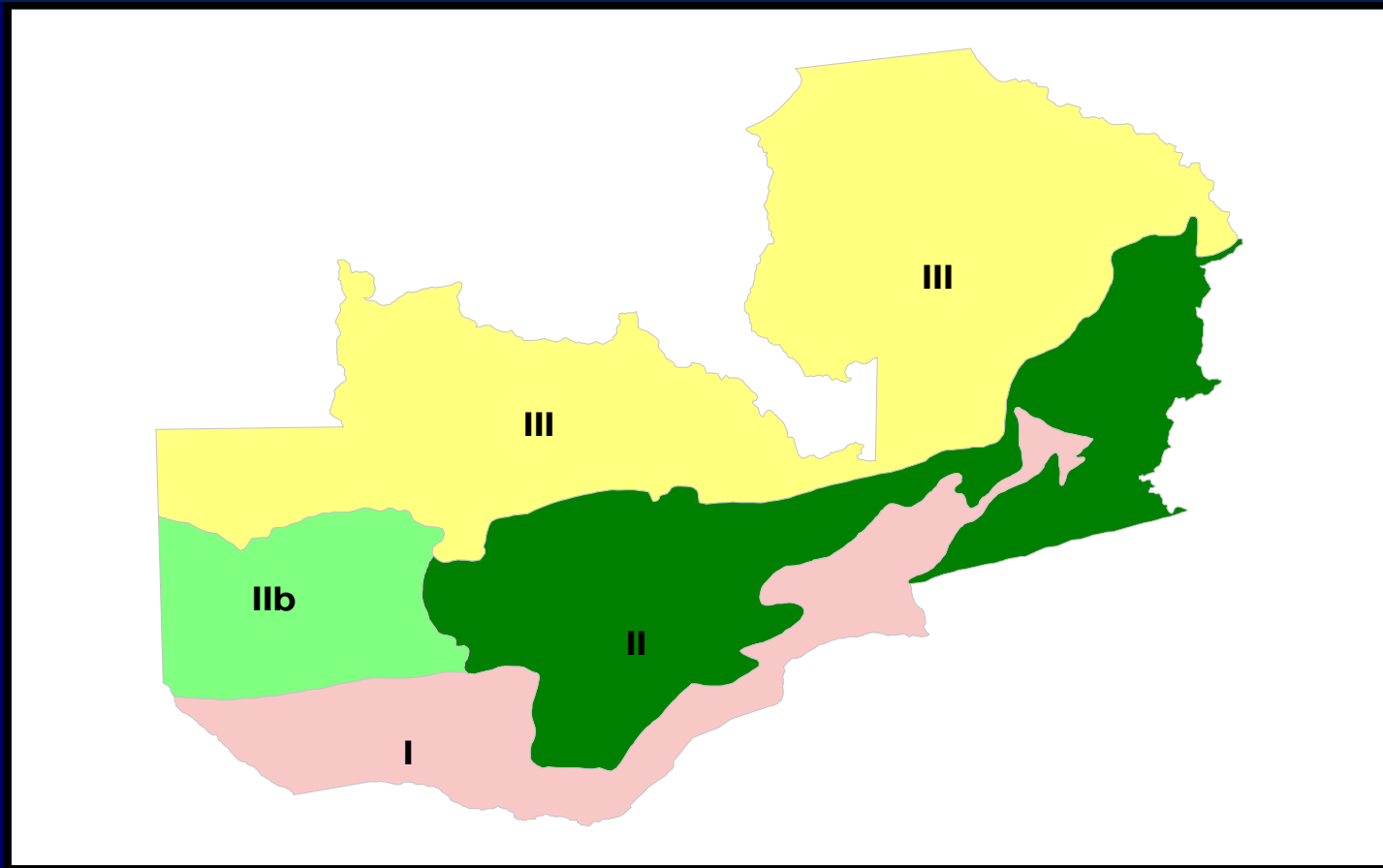


Figure 1. Agro-ecological Regions.

III	-	Region III
II	-	Region II
IIb	-	Region IIb
I	-	Region I

Zambia

Area: 752,614 square kilometers

Population: 11.7 million

- growth rate of about 2.9%



752,614 square kilometers

75,185,000 ha landmass

- 16,540,700 ha is suitable for arable use
- Roughly 14 percent is under cultivation



Agriculture

- **provides** livelihoods to more than 50 % of Zambia's population
- **absorbs** about 67 % of the labour force
- **main source** of income and employment for rural women who constitute 65 % of rural population.



Farmer Category

700 large-scale commercial - over 40 ha;

5,000 semi-commercial farmers – 20 to 40 ha;

75,000 emergent farmers - 5 to 20 ha; and

850,000 small-scale farmers - restricted mainly by energy to managing 0 to 5 ha



Poverty

- 68 % of the population earn less than 32 USD per month
- Extreme poverty (people earning less than 22 USD per month) stands at 53 %
- In rural areas incidence of poverty stands at 78%
- Rural small scale farmers have the highest incidence of and stands at 79%
 - with 66% being extremely poor

Hunger

- Household food insecurity is more prevalent in rural areas and stands at 60 per cent.



Limited power

- Rural people have no energy to
 - pump water
 - Cultivate their land etc.



Energy

- 97% of Zambia's population depends on wood-fuel (firewood & charcoal) for cooking and heating

- Deforestation

- 350,000 – 400,000 ha of forests every year



Deforestation

- Soil loss

- Rapid soil fertility decline which cannot be rectified by use of petroleum based fertilizers



Petroleum products

- Account for 12 % of Zambia's energy needs.
- imports all its petroleum requirements
 - Hence insecure in both supply and prices



National Requirement of Petroleum products

- 45,000 liters per day or 16.425 million liters per annum of gasoline (petrol)
- 1.1 million liters per day or 401.5 million liters per annum of diesel



Need to reduce full dependency on Petroleum Products

Zambia needs to get good

- Petrol extender – bioethanol
- Diesel extender - biodiesel



Zambia's perception of Biofuels

- could ensure security of supply of fuel
- have potential to contribute towards poverty alleviation among the rural poor.



Government is keen to establish a biofuels industry

1. Has constituted inter-ministrial steering committee to spearhead biofuels development



2. Facilitated the formation of Biofuels Association of Zambia (BAZ).

ZAB is an association of firms, companies and individuals involved and/or planning to be involved in the production of feedstock and/or biofuels in Zambia



3. Has allocated equivalent to 150,000 United States Dollars for research work on *Jatropha Curcas* and other biofuels in its 2007 budget.



4. Revising the Energy Policy to accommodate biofuels



5. Has drafted Biofuels Legislation



6. Has facilitated the drafting of Biofuels Standards through the Energy Regulation Board



Need for Bioethanol

- To blend with gasoline petrol to 5% by 2011



Ethanol Production Plans from Sugar Cane

Raise sugar output by almost 70 % to

- Meet rising local demand,
- supply exports to the EU and
- produce ethanol.



Ethanol Production Trials from Sweet Sorghum

- . Sweet sorghum possible alternative or complementary crop to provide raw material to the sugar cane for ethanol production

The potential has been evaluated by the University of Zambia



Figure 2: Fresh Stem Yield of Sweet Sorghum Varieties

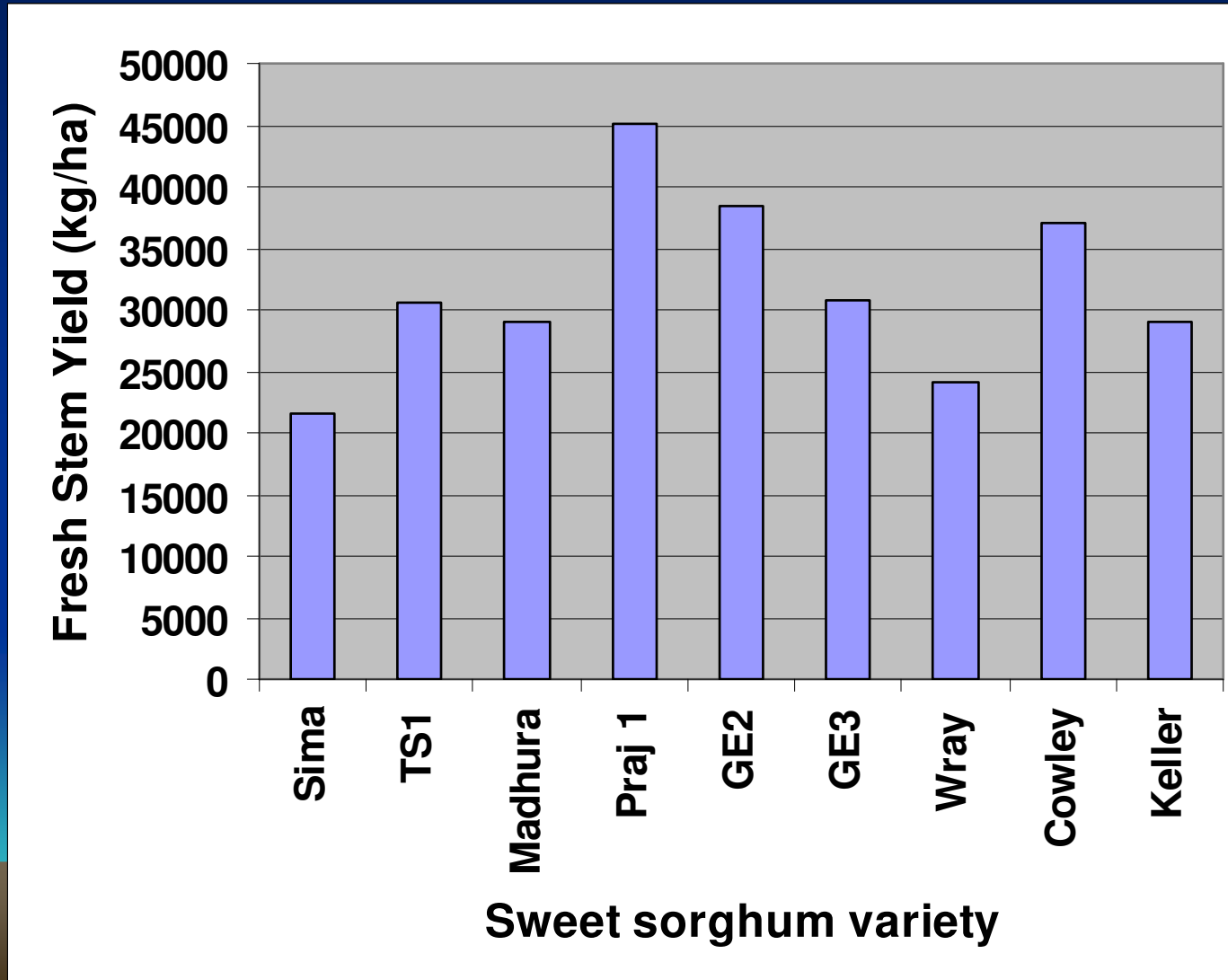
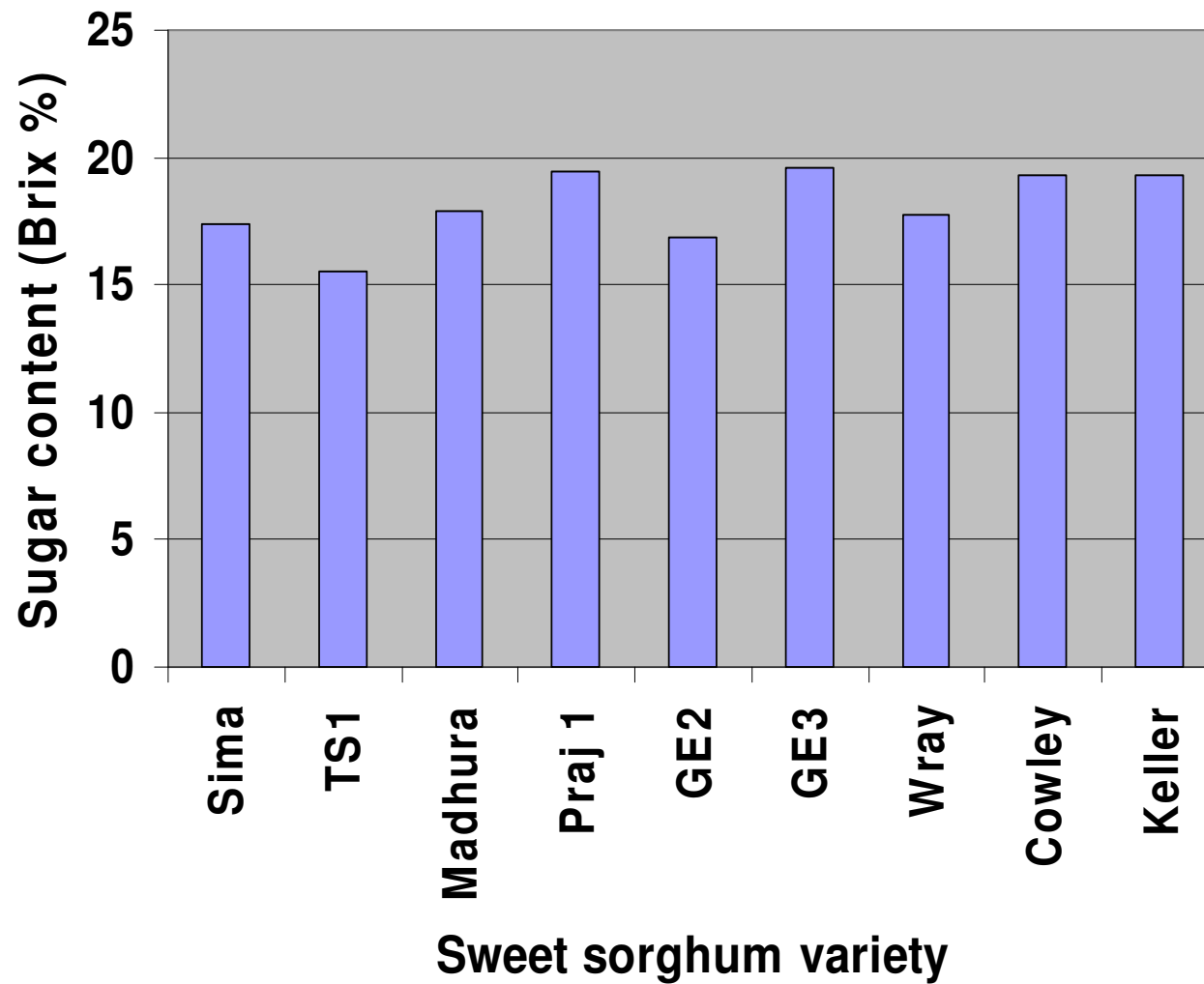


Figure 3: Sugar content of sweet sorghum varieties



Preliminary Results

- show promise that production of sweet sorghum could be integrated with sugar cane production



Need for Biodiesel

- To blend with fossil diesel to 10% by 2011
- **And also Viable Energy alternative to wood fuel**



Viabile Energy alternative to wood fuel

- (1) whose source is renewable and does not require much foreign exchange for its production;
- (2) whose production can be decentralized and
- (3) Can be incorporated in land use planning in order to improve the ecological conditions in rural areas – thereby contribute towards hunger and poverty reduction in general.



Jatropha Curcas

- Identified as the plant that possesses all the three characters.



Jatropha Curcas Oil

- (1) good alternative to paraffin in lamps;
- (2) good in running grinding mills, water pumps and decentralized generation of electricity; and
- (3) a good substitute to tallow,



Limited Experience with Jatropha in Zambia

- soap making enterprise – women groups
- demonstrations on the various uses of Jatropha oil through National Agricultural and Commercial Shows.
- Three-day workshop to train some entrepreneurs spearheaded by Dr. Henning on Jatropha System .

