



The Sweet Sorghum-to-Ethanol Initiative:

The Nigerian Experience.

A Presentation To

SWAC FORUM 2011

By

Felix Babatunde Obada, PhD.

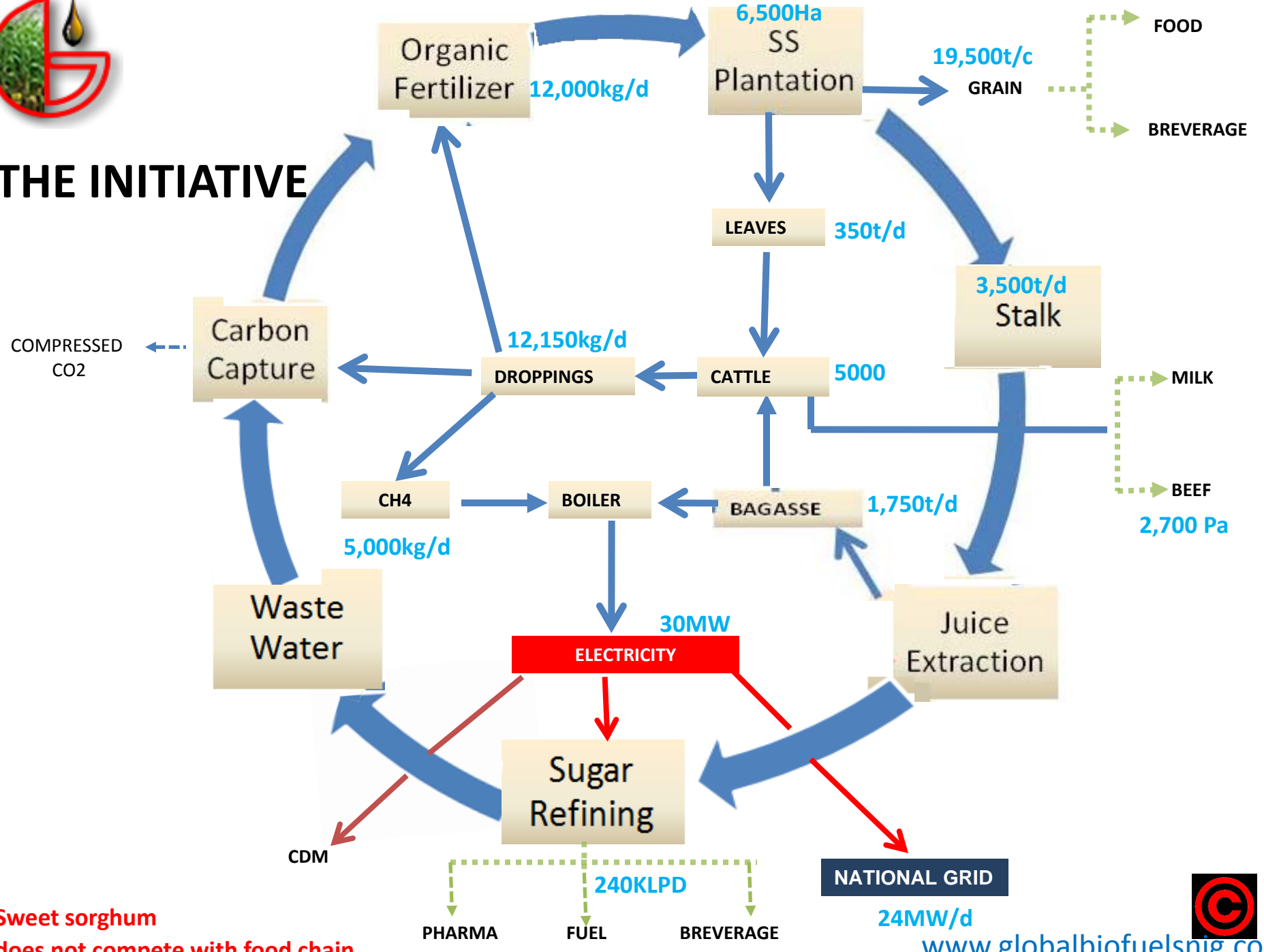
GMD/CEO Global Biofuels Nigeria

6th Dec.2011

Praia, Cape Verde.



THE INITIATIVE



Sweet sorghum does not compete with food chain





Why Sweet Sorghum?

- Growing period (about 4 months) as against 9-16 month for sugarcane.
- Water requirement (8000m³) as against 25,000m³ sugarcane
- As against cassava and corn, does not compete with food chain
- Cost of cultivation of sweet sorghum is 3 times lower than sugarcane
- Soft and friendly, requires less energy to crush
- Sequesters carbon dioxide better than other energy crops
- Leaves excellent as animal feed
- Effluent usable as liquid fertilizer
- The entire plant is useful
- Ethanol burning quality is superior- less sulphur than from sugarcane.





COMPARATIVE Advantages of Using Sweet Sorghum as Raw Material for Ethanol Production: Relative to other sources

Parameter	Sweet Sorghum	Sugarcane
Harvesting Cycle	4 months	9 – 16 months
Cycle(s) per year	2-3	1
Water Requirement	60 – 70%	100%
Fertilizer Requirement	40%	100%
Stalk Production (MT/Ha/Cycle)	45 – 75/cycle	65 – 80
Fermentable Sugar (Concentration in stalk % w/w)	80 – 110/2 cycles	10.0 - 14.0
Fermentable Sugars (Yield MT/Ha/Cycle)	9.0 – 12.0	6.0 – 10.5
Ethanol Yield (Litres/Ha/Cycle)	3.6 – 6.2/cycles	3400 – 6000
Bagasse Yield (MT/Ha/Cycle @ 50% moisture)	7.2 – 12.4/2cycles	19 – 24
	2020 – 3500/cycle	(30% on cane weight)
	4000- 7000/2 cycles	
	10 – 14/cycle	
	20 – 28/2 cycle	
	(25% on stalk wt.)	





CONVERSION TECHNOLOGY

* Sugar Based (Sweet Sorghum, Sugar Cane etc):

Sugar + Micro Organisms (Yeast) = Ethanol

Fermentation

* Starch Based (Cassava, Corn, etc.):

Starch + Enzymes + Micro Organisms (Yeast) = Ethanol

Digestion

Fermentation

* Cellulose (sugar from any plant)

pre-treating chemically into sugars + ferm.= Ethanol

Each conversion method
Leads to different Production
Technology, Bio-refinery Design and costs.
Sweet Sorghum Refinery Design Simplest and
Cheapest





Challenges

- Finance.
- Policy and Regulatory Framework.
- Legislation.

Opportunities

- Grants to developers.
- Soft Loans/Intervention Funds.
- National Body to oversee the orderly development of the biofuels sector.





About Global Biofuels Nigeria

- Established in 2008
- Pioneering the development of the Biofuels Industry in Nigeria
- In Collaboration with:
 - Various State Governments
 - The Nigerian National Petroleum Corporation
 - Nigerian Export-Import Bank
 - The Ecowas Bank for Investment & Development
 - China Export Credit Insurance Corporation
 - International Crop Research Institute for the Semi-arid Tropics
 - The Institute of Agricultural Research Nigeria
 - National Animal Production Research Institute Nigeria
- KPMG- Project Managers.





THANK YOU