

# **The *Replicability* of the Brazilian Bioenergy Model in Africa**

By Klaus G. Dalgaard  
Research Fellow  
LACAf Project  
University of Campinas  
Brazil

# Defining *Replicability* & BR mentality

***Replicability***. Definition: Property of an activity, process, or test result that allows it to be duplicated at another location or time.

(<http://www.businessdictionary.com/definition/replicability.html>)

*“for each African problem, there is a Brazilian solution”*

– Representative of the Brazilian Cooperation Agency (ABC) in Maputo, Mozambique

[Cited in Alves, A.C. (2013) ‘Brazil in Africa: Achievements and Challenges’. In Alden, C. *et al.*, *Emerging Powers in Africa*. London: LSE IDEAS Special Reports.]

# Brazilian Foreign Policy Under Lula

- *Why Africa?*
- *How to pursue this policy in Africa*

# Defining the Brazilian bioenergy model: main characteristics

- Joint sugar/ethanol production
- Privatised & Deregulated
- Focus on production for transportation fuels & Flex-Fuel Vehicles
- Large-scale & Hi-tech, with bioelectricity cogeneration

# Different kinds of sugarcane production in Brazil

Brazilian sugarcane production can be classified in three categories:

- 1) Sugar mills that only produce sugar;
- 2) Sugar mills with distilleries, which produce both sugar and ethanol;
- 3) Independent distilleries that only produce ethanol.

The largest group is the one that combines sugar mills and distilleries (close to 60% of the total).

Around 85% of all sugar and ethanol are produced in sugar mills with annexed distilleries.

# Joint sugar/ethanol production

- \* Full use of all sugars in sugarcane and not only sucrose.
- \* Better quality raw sugar can be produced, with less energy use as final molasses are not exhausted of all sugars.
- \* The beginning of the crushing season can be anticipated since the lower sucrose content of the cane is partially compensated by a higher inverted sugar content.
- \* All sugar recovered (as sugar or ethanol) is sold at sugar prices, while the molasses (in sugar only mills) are sold at much lower prices.
- \* The flexibility of producing more sugar or more ethanol with the same cane milling allows mills to adjust production according to market needs.
- \* Diversification of sugarcane derivatives contributes to diminishing production and operational costs.

# Privatized & Deregulated

- Completely privatized; no PPP
- Fully deregulated: anhydrous '97, hydrous '99
- Only regulation left: E18-E25 blend mandate
- High efficiency of BR mills due partly to competitiveness after deregulation

# Focus on transportation & FFVs

- World's highest blend mandate (E18-E25) = high market penetration & energy mix share
- Increasing FFV share of car fleet = rapidly growing demand for ethanol
- FFVs allow consumers to arbitrage between gasoline & ethanol price at the pump
- Blend mandate + FFVs = ethanol 20.4% of all transport fuel in BR (2009 figure)



# Large-scale, Hi-tech, Cogeneration

- Sugarcane ethanol benefits from economies of scale
- Distilleries built within large monocultures are the dominant mode of production
- Better management and technologies
- Significantly reduced production costs
- Electricity cogeneration from bagasse burning

# Problems with large-scale model

- Large scale more capital intensive, less labour intensive than small scale
- Many small-scale producers in Africa: hard to compete with BR-style large-scale model
- Leads to concentration of land ownership to a few powerful large-scale producers

# The limits of *Replicability*

- Despite similar edaphoclimatic conditions, Africa is *not* like Brazil!
- Several African challenges to the BR model
- The problem with BR's "one-size-fits-all" mentality
- Importance of understanding local contexts
- Brazil's policy myopia

# Conclusions

- From *Replicability* to *Adaptability*
- Even *Adaptability* to different contexts should not be taken for granted
- Context is paramount