# Promotion of Wood-Based Bioenergy in the Tropics: Opportunities and Challenges

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International Expert Meeting on Addressing Climate Change
Through Sustainable Management of Tropical Forests

30 April 2008, Yokohama, Japan


"Massive production of biofuels is a crime against humanity"

*- Jean Zeigler*

*UN Special Rapporteur for the Right to Food*

"The real crime against humanity is to discredit biofuels and condemn food-starved and energy-starved countries to dependency and insecurity."

*- Luiz Inacio Lula da Silva*

*President of Brazil*

# International Conference on Wood-Based Bioenergy

Hanover, Germany (May 2007)

# Key Points from the Hanover Conference

- Wood-based energy offer countries, including developing countries in tropics, an opportunity to increase their energy security.
- Wood industries can use wood residues for the co-generation of energy, thereby increasing the cost-effectiveness of their operations and improving energy efficiency.
- Using wood-based bioenergy, in the wood industry and in general, can help reduce greenhouse gas emissions.

# Key Points from the Hanover Conference (cont'd)

- The wood-based bioenergy sector needs to be developed on the basis of sustainable forest management

- The international community should support the development of efficient and cost-effective wood-based bioenergy in tropical countries and facilitate appropriate technology transfer and investment.

What are the major recent developments in the wood-based bioenergy sector?

# Global Wood Harvesting (2005)

3.1 billion M3 of which:

- 1.4 billion M3 is used as firewood
- 0.5 billion M3 is used by the pulp and paper industry

# Major Developments of Wood Use

- For the production of liquid fuels (mainly ethanol)
- For power generation on sale through the grid

# Ethanol Production per Ha (liters)

- Corn: 3,100
- Sugarcane: 6,900
- Wood energy plantation: 7,300 - 16,000

# Energy Efficiency

| | |
|---|---|
| Corn ethanol: | 1.34 |
| Gasoline: | 5 |
| Sugarcane ethanol: | 8.3 |
| Wood ethanol: | up to 16 |

# Emissions Reductions (*cf.* gasoline)

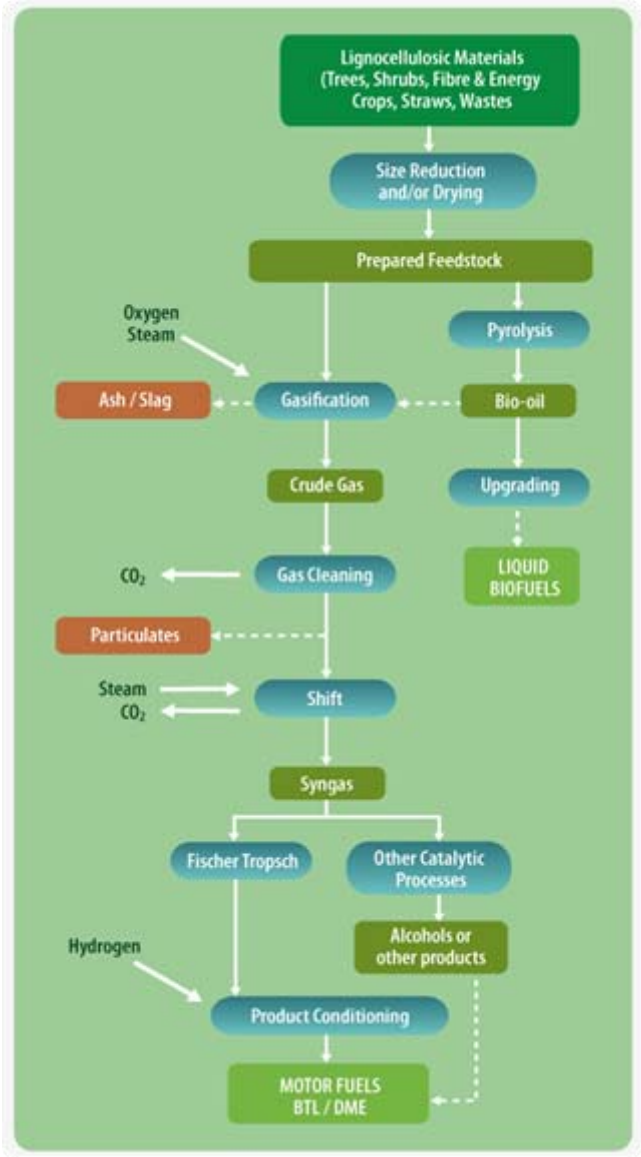
Corn ethanol – 20%

Sugarcane ethanol – 56%

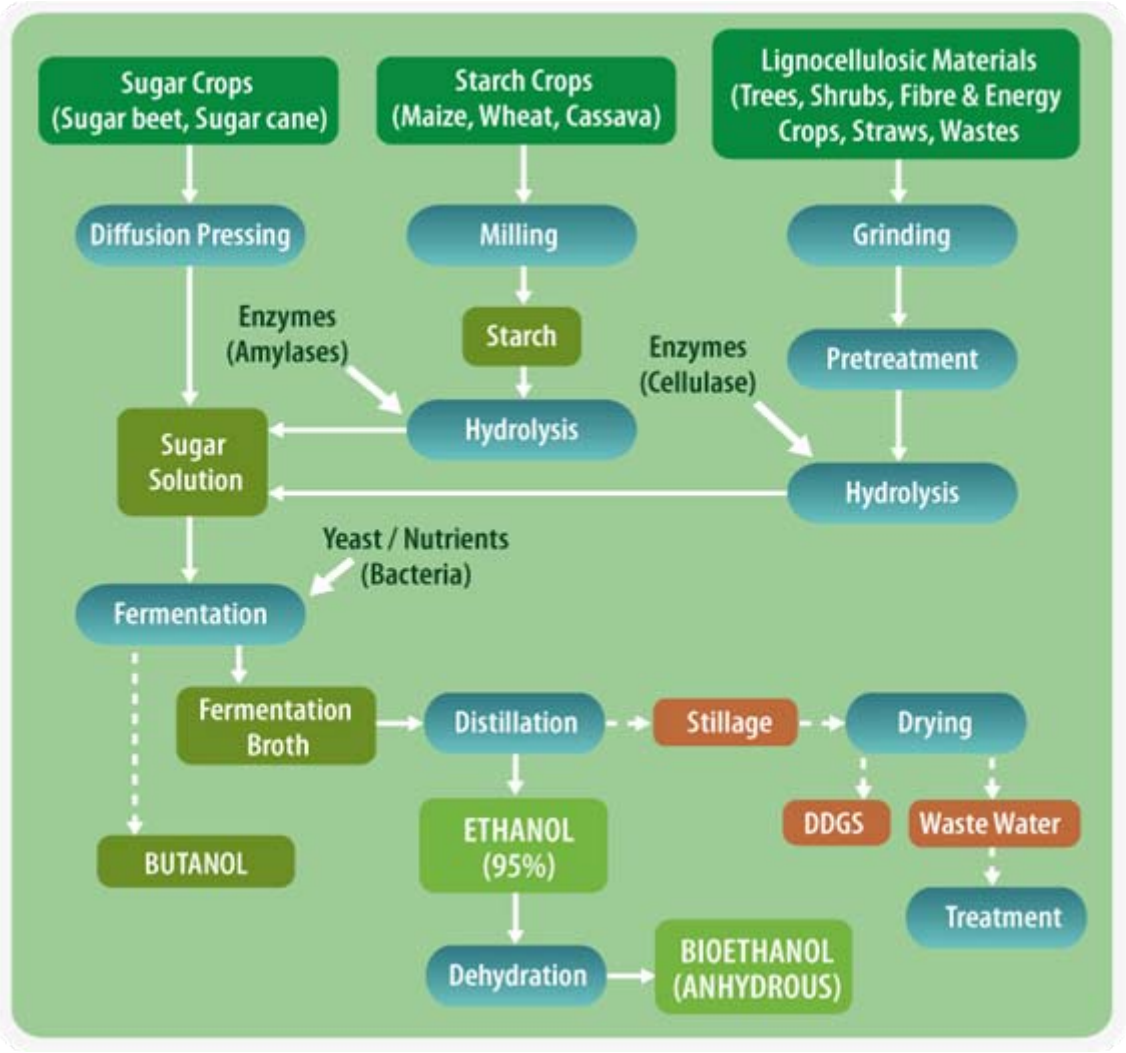
Wood ethanol – 80%

# Wood Ethanol Production

- Plant capacity: 265 million liters/year
- Ethanol yield: 292–420 liter/ dry wood ton
- Wood raw material cost: US$40/dry wood ton
- Ethanol production cost: US$ 0.33 to 0.43/liter
- Corn Ethanol production cost: US$ 0.46(with corn at US$3.5/bushell)
- Sugarcane Ethanol production cost: US$ 0.3/liter




# Thermochemical routes to liquid biofuels




# Biochemical routes to liquid biofuels

# Is commercial wood ethanol already here?

- Several pilot and semi-commercial plants already are in operation.
- Over 20 new commercial or semi-commercial plants under construction

Total land area – 850 million Ha

Agricultural land – 347 million Ha,

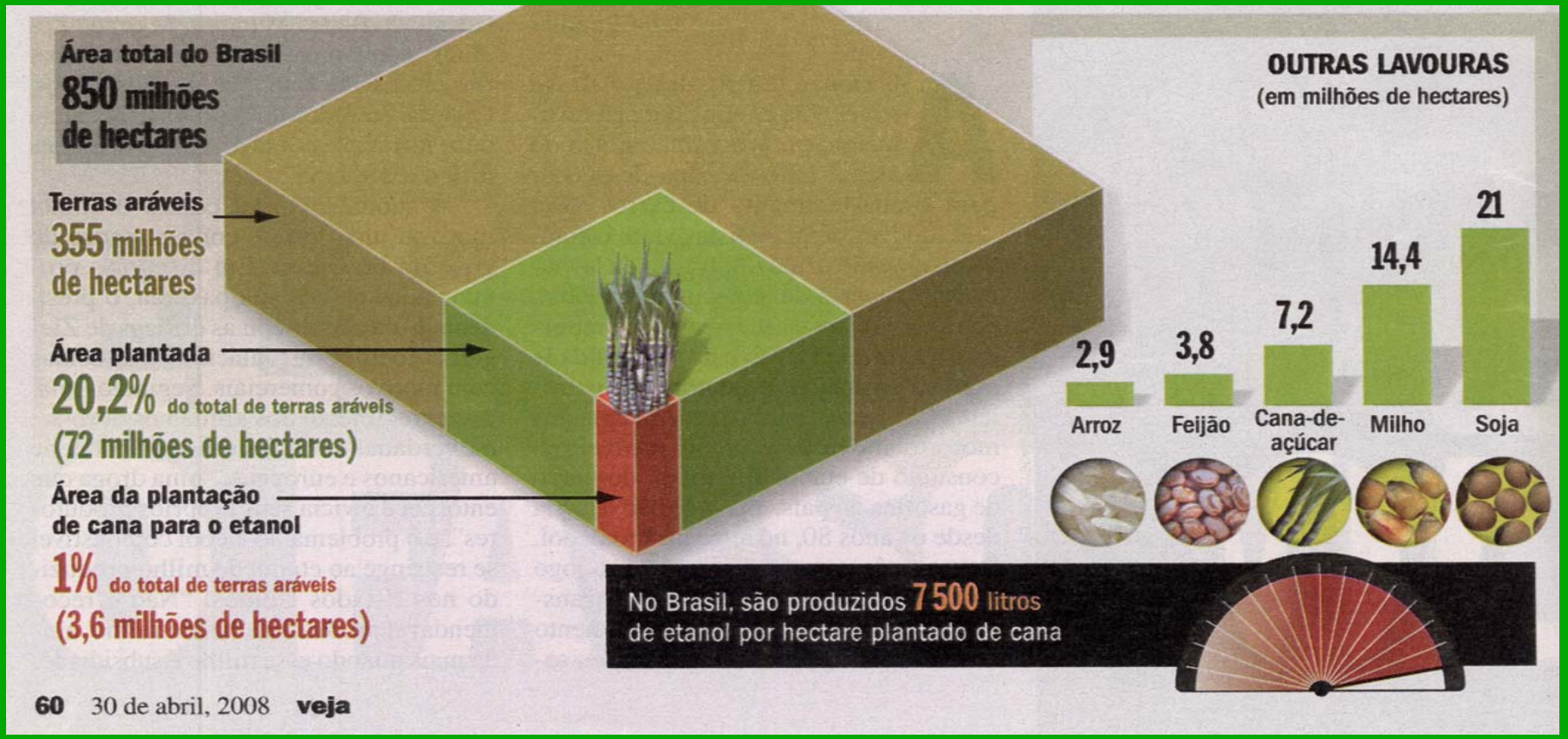
of which…

Pastures – 211 million Ha

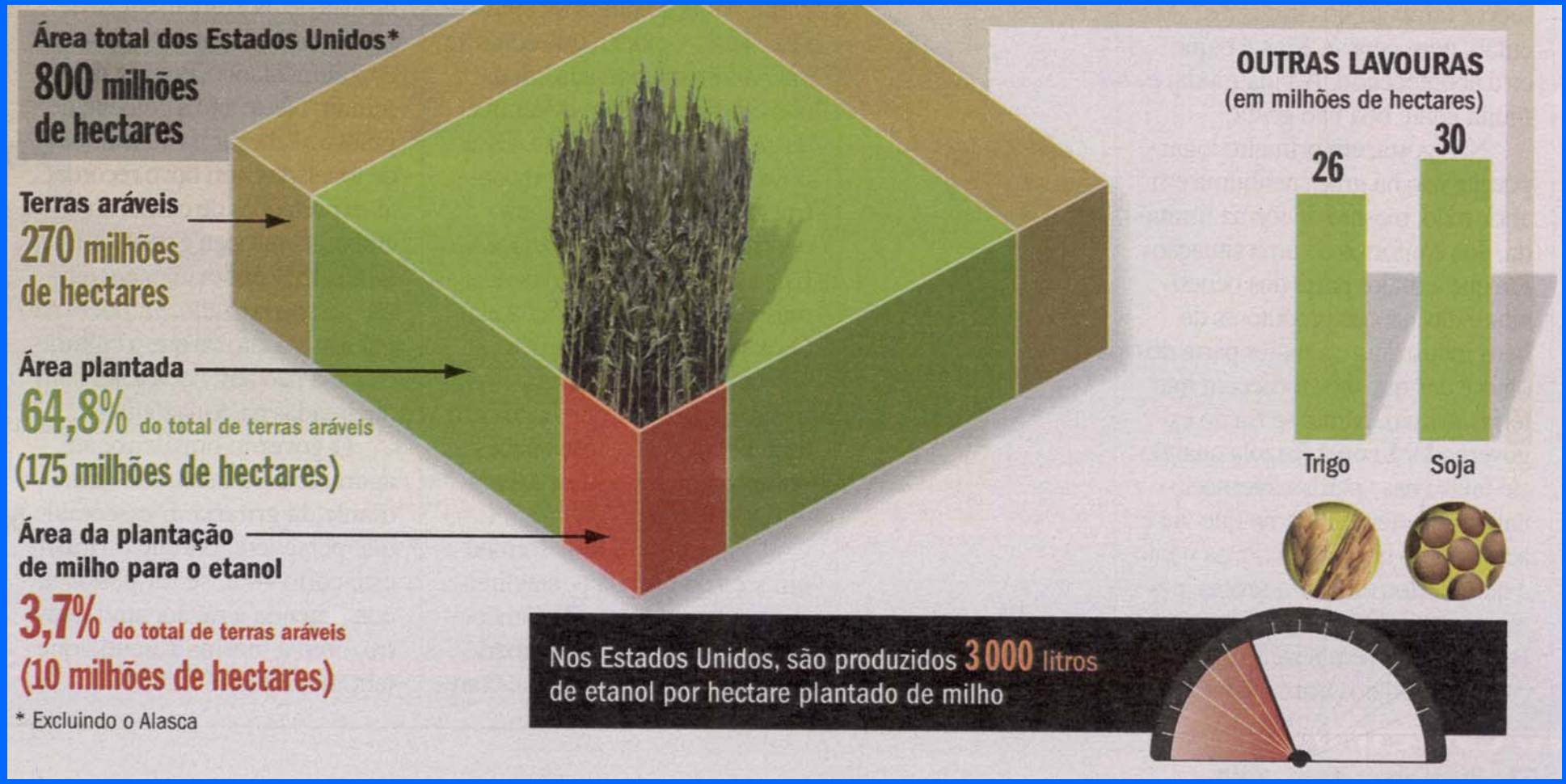
Grains & other food crops – 63 million Ha

Sugarcane – 7.8 million Ha

# Brazil


Área total do Brasil
850 milhões de hectares
Terras aráveis
355 milhões de hectares
Área plantada
20,2% do total de terras aráveis
(72 milhões de hectares)
Área da plantação de cana para o etanol
1% do total de terras aráveis
(3,6 milhões de hectares)
OUTRAS LAVOURAS
(em milhões de hectares)
2,9
Arroz
3,8
Feijão
7,2
Cana-de-açúcar
14,4
Milho
21
Soja
No Brasil, são produzidos 7 500 litros de etanol por hectare plantado de cana
60 30 de abril, 2008 veja

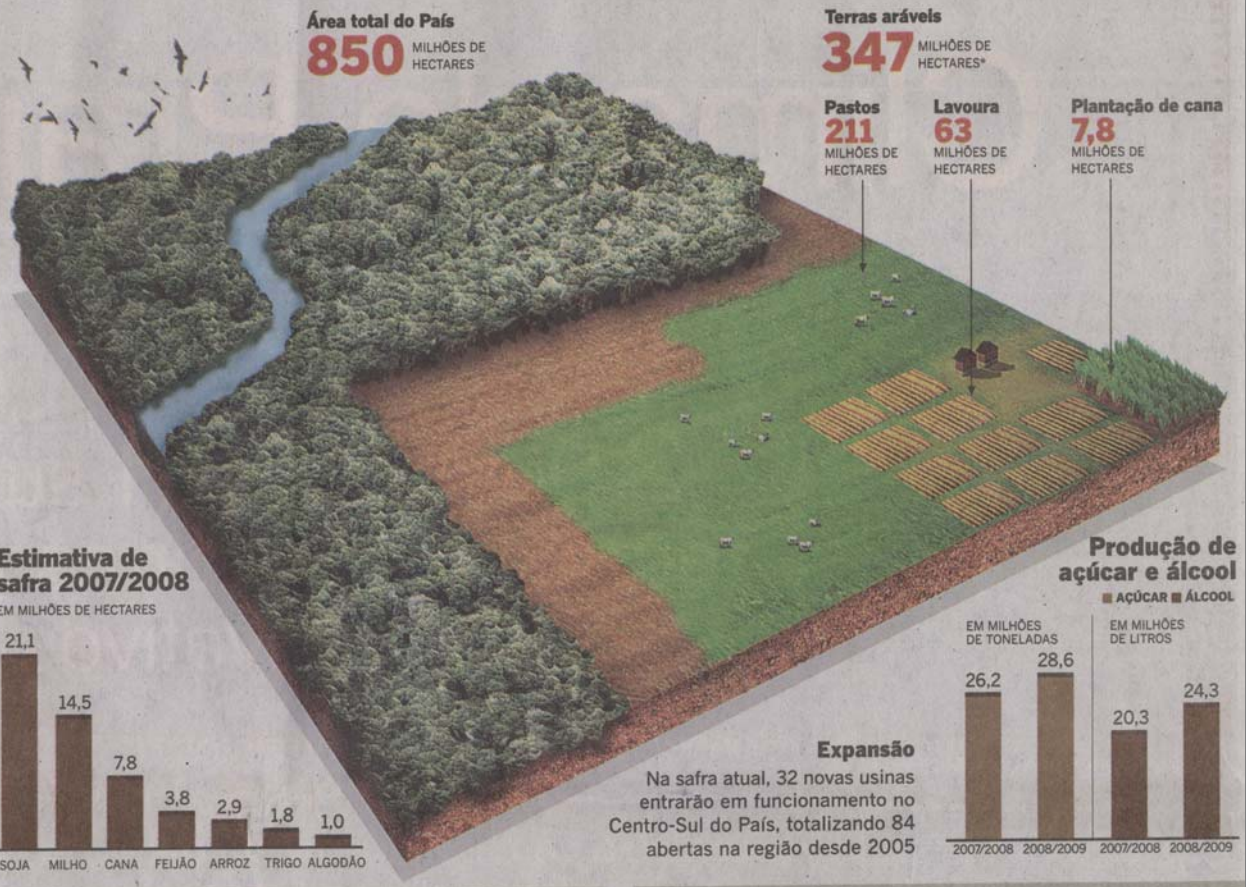
# USA


Área total dos Estados Unidos*
800 milhões de hectares
Terras aráveis
270 milhões de hectares
Área plantada
64,8% do total de terras aráveis
(175 milhões de hectares)
Área da plantação de milho para o etanol
3,7% do total de terras aráveis
(10 milhões de hectares)
* Excluindo o Alasca
OUTRAS LAVOURAS
(em milhões de hectares)
26
30
Trigo
Soja
Nos Estados Unidos, são produzidos 3 000 litros de etanol por hectare plantado de milho

NÚMEROS DO CAMPO

# O uso das terras no Brasil

A lavoura de cana-de-açúcar está avançando no País, mas, de acordo com estudo da Conab, não ameaça a área onde são produzidos alimentos




## Estimativa de safra 2007/2008

EM MILHÕES DE HECTARES




## Produção de açúcar e álcool

AÇÚCAR ÁLCOOL




## Expansão

Na safra atual, 32 novas usinas entrarão em funcionamento no Centro-Sul do País, totalizando 84 abertas na região desde 2005

## O cultivo da cana

Quanto aumentou em relação à safra anterior

**653.700 hectares**

Como se deu o crescimento

**65%** sobre área de pastagens, tendo ocupado **0,2%** do total

**22%** sobre área de grãos, tendo ocupado **0,4%** do total

## O que é exportado

Álcool destinado ao mercado externo:

**3,9 bilhões de litros**

Açúcar destinado ao mercado externo:

**18,9 milhões de toneladas**

* Sem considerar Amazônia, Pantanal e áreas de preservação

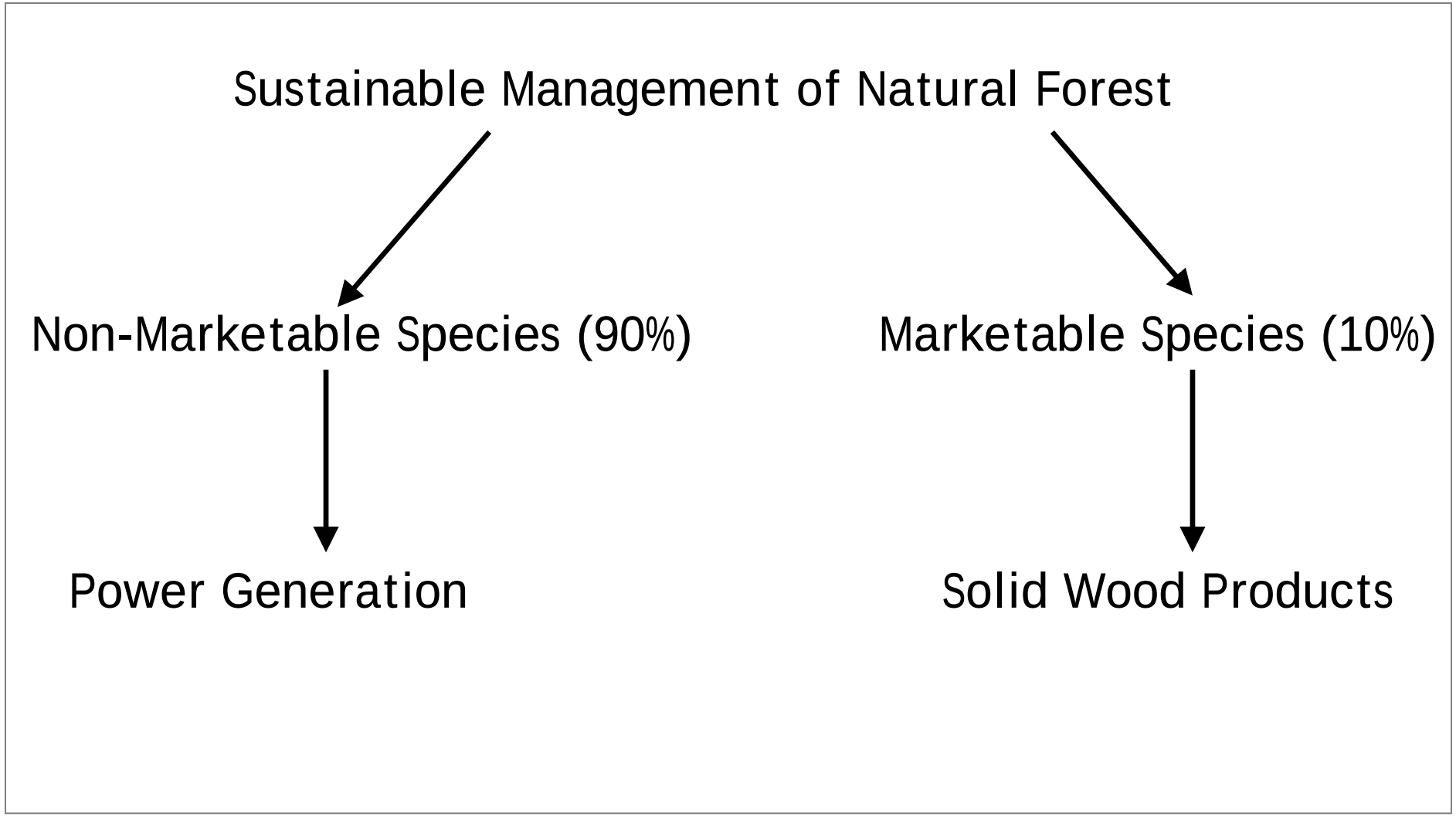
FONTE: UNICA E CONAB

INFOGRÁFICO: DANIEL RODA/A

# Impact on Tropical Countries and Forests

- Greater demand and competition for land
- Increased deforestation risks, but may enhance economic feasibility of Sustainable Forest Management (SFM)
- May enhance prospects for rehabilitation of degraded forests, but land owners will likely favor monoculture.

# Precious Wood SFM Operations



# Our Emissions to Attend this Conference

120 grams of $CO_2$ per passenger-kilometer

For an intercontinental trip:

Approx. 2 tons of $CO_2$ per passenger