

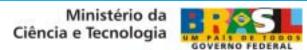
#### Brazilian Science and Technology Research on Climate Change at a Glance

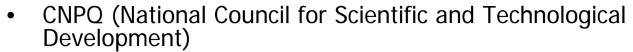
Bonn, 19 May 2006

#### José Miguez

Ministry of Science and Technology General Coordination on Global Climate Change Executive Secretary of the Interministerial Commission on Global Climate Change

### ) in Brazil





- Annual Budget (US\$ 1.5 billion in the last 5 years and increasing):
  - 2001 US\$ 262 millions
  - 2002 US\$ 266 millions
  - 2003 US\$ 289 millions
  - 2004 US\$ 311 millions
  - 2005 US\$ 335 millions
- Support for 51,753 scholarships in Brazil and Abroad
  - MsD 7,256 (only in Brazil)
  - PhD 6,863 (Brazil) and 181 (Abroad)
- Several researches/thesis related to Climate Change
  - Bottom-up approach
- INPE (National Institute for Space Research)
  - Annual Budget US\$ 80,5 millions
  - Several researches/thesis related to Climate Change specially on deforestation issues in Amazonia
  - Budget for Earth Observation satellites images US\$ 2 millions (CBERS data and others)
    - MAPSAR (Multi-application Purpose Synthetic Aperture Radar) initiative (DLR)

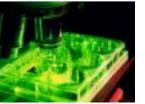
      (Average US\$ in 2005 = 2.40)





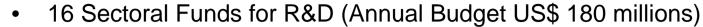






# ) in Brazil



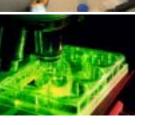


- S&T Oil US\$ 36 millions
  - To stimulate the innovation of oil sector and natural gas productive chain.
- S&T Hydro US\$ 18 millions
  - Capacity building of human resources and products development to improve the use of hydro resources.
- S&T Energy US\$ 31 millions
  - Stimulate the research and innovation turn to new alternatives of energy generation with low costs and better quality.
- S&T Amazonia US\$ 8,6 millions
  - To foment research activities and the development in Amazon Region.
- S&T Transports US\$ 86,286
  - To improve the quality, costs reduction and competitiveness increase of road transportation in Brazil.
- Green and Yellow US\$ 87 millions
  - To stimulate the implementation of scientific research projects and technological cooperation between universities, researches centers and the productive sector.



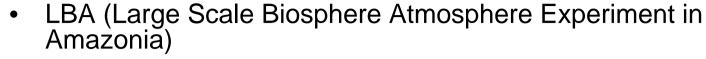






## ) in Brazil





- Objective:
  - LBA is an international research initiative coordinated by Brazi being implemented since 1998
  - LBA to create new knowledge for the understanding of the climatological, ecological, biogeochemical and hydrological functioning of Amazonia and the impacts of land use change in the local regional and global climate
- Annual Budget (2005) US\$ 2,7 millions
- 120 Projects

• Brazilian 20

Brazil/USA 81 (Amazonian Countries 4)

Brazil/EU 18 (Amazonian Countries 2)

Brazil/USA/EU

- LBA Indicators from 1998 to January 2006
  - Scholarships 932 (MSc 297; PhD 241)
    - Papers, Monographs and Thesis 1142 (MSc 166; PhD 144)
    - Researchers 1803 (Brazilians 1054; Foreigners 749)









### Priority in Climate Change io da

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  - MCT General Coordination on Global Climate Change
    - Annual budget US\$ 600,000 per year
    - National Communication 150 institutions and 700 experts
  - Inventory Preparation
    - Development of National Emission Factors
      - Livestock (Beef and Dairy Cattle)
      - Rice (Irrigated/Flooded lands in the South of Brazil)
      - Deforestation (Complete monitoring since 1978)
        - 4 Layers Cells (Soil, Vegetation, Municipalities, Land Use)
      - Methane Emissions from 10 Reservoirs in different biomes and latitudes (2 campaigns in 2 years)
  - Vulnerability and Adaptation
    - Coastal Zones
    - Coral Bleaching
    - Vegetation under 2xCO<sub>2</sub> (Jatobá (*Hymenaea courbaril* stinking toe) and Sugar Cane)
    - Disease propagation (Dengue, Malaria, etc)
    - Precipitation (Hydro Management)

















#### Priority in Climate Change encia e Tecnologia



- Climate Change Modeling
  - Downscaling of Hadley Centre Model and Max Planck Institute Models
    - Use of ETA/MACRO Model of INPE/CPTEC
      - 10% of Supercomputer Time (.768 T Flops)
      - 8 T Bytes Data Storage Capacity

#### Renewable Energy

- Flex Fuel Car Technology (Gasohol/Ethanol and Gasohol/Ethanol/Natural Gas)
- Sugar Cane/Ethanol Industrial and Agricultural Improvement of Productivity (7000 I/ha)
- Fuel Cells using Ethanol
- Airplane for Agriculture Use burning Ethanol (EMBRAER)
- Biodiesel from Castor Seed Oil (Ethanol Route)
- Cogeneration using Bagasse, LFG and Methane from Manure in Pig Farms (CDM)





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