Las Políticas Públicas sobre Ciencia, Tecnología e Innovación en América Latina y el Caribe: su adaptación a las necesidades de desarrollo de la Región

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Lima, October 13, 2016
To Brazil realize the dream of a prosperous, just and sovereign society is crucial that progress in structuring an economic basis supported by an endogenous and dynamic process of innovation building an ambitious agenda of ST&I, which should have as foundation education and basic research of quality.
Sustainable Development

ST&I as a basis for sustainable development
Brazil at a Glance

- Population: 206 million
- Total Area: 8.5 million km²
- GDP (2015): US$ 1.77 trillion
- Scientific Production: 2.37% of the World (2015)
  - Scientists and Researchers: 180 thousand (2014)
  - Enterprises (industrial Sector): 512 Thousand (2016)
Gross domestic expenditure on R&D as a percentage of GDP

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Expenditure as a % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile (2012)</td>
<td></td>
<td>0.36</td>
</tr>
<tr>
<td>México (2013)</td>
<td></td>
<td>0.50</td>
</tr>
<tr>
<td>Argentina (2013)</td>
<td></td>
<td>0.58</td>
</tr>
<tr>
<td>BRASIL (2013)</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>África do Sul (2012)</td>
<td></td>
<td>0.73</td>
</tr>
<tr>
<td>Índia (2012)</td>
<td></td>
<td>0.88</td>
</tr>
<tr>
<td>Rússia (2013)</td>
<td></td>
<td>1.12</td>
</tr>
<tr>
<td>China (2013)</td>
<td></td>
<td>2.08</td>
</tr>
<tr>
<td>Espanha (2013)</td>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td>Italia (2013)</td>
<td></td>
<td>1.26</td>
</tr>
<tr>
<td>Canadá (2013)</td>
<td></td>
<td>1.62</td>
</tr>
<tr>
<td>França (2013)</td>
<td></td>
<td>2.23</td>
</tr>
<tr>
<td>EUA (2013)</td>
<td></td>
<td>2.73</td>
</tr>
<tr>
<td>Alemanha (2013)</td>
<td></td>
<td>2.85</td>
</tr>
<tr>
<td>Japão (2013)</td>
<td></td>
<td>3.47</td>
</tr>
<tr>
<td>Coréia do Sul (2013)</td>
<td></td>
<td>4.15</td>
</tr>
</tbody>
</table>
Changing world

New classes of problems:

✓ what is the molecular basis of life and death?
✓ functioning of the brain - the human-machine interaction
✓ cognitive computing
✓ energy: generation, use, storage and conservation
✓ water and food security
✓ conflict and national security
✓ climate instability
✓ ...

...
Some advances in ST&I policy in Brazil

- **Human Resources**
- **Research Networks**
- **Research Infrastructure**
- **Innovation Support**

- Sirius
- RMB
- Satélite CBERS-4
- Ship “Vital de Oliveira”
INCT – National Institutes of Science and Technology

The networks of the best research groups in strategic areas with interaction with the productive system and society, providing a strong national distribution of scientific and technological research.

**Distribuição de INCT por temas**

- Saúde: 30%
- Engenharias, Física e Matemática: 10%
- Biotecnologia e Nanotecnologia: 9%
- Ciências Sociais: 8%
- Agronegócio: 7%
- TIC’s: 6%
- Amazônia: 6%
- Biodiversidade e Meio Ambiente: 6%
- Energia: 6%
- Mar e Antártida: 5%
- Outras: 5%
- Nuclear: 2%

**125 inct institutos de ciência**
National Integration and Interaction
1,937 institutions
6,794 researchers
436 partnerships with public entities and/or non-governmental

Human Resources Training
10,994 trained researchers
79 Graduate Programs created
566 disciplines created

International Cooperation
787 international cooperation agreements
1,318 foreign researchers
139 companies
376 international associated laboratories

Science, Technology and Innovation Production
70,389 records of academic publications
578 patent applications
12 patents already in marketing
Human Resources Training

Federal Universities

- Total sites: 63
- Campus total: 321
- Municipalities served: 275

Federal Network Professional Education, Science and Technology

- Campus total: 644
- Municipalities served: 568
Ipê/RNP Network - the internet network infrastructure dedicated to the Brazilian community of higher education and research.
MCTIC - National Presence

Parques Tecnológicos
- (28 em operação)
- (28 em implantação)
- (38 em projeto)

Redes de Pesquisa:
- Rede Clima
- Rede Pra-Centro-Oeste
- Rembrtio
- FFBio
- ComCerrado
- LBA
- GEOMA
- BF-Bio
- RENAMA
- RRC
- Rede BIOSUL
- Rede de Bioinformática
- Rede CRB-Br
- Rede Biotecnologia Marinha

Navio Hidroacústico
“Crusoeiro do Sul”

Supercomputador
SANTOS DUMONT
LNCC

Supercomputador
TUPA/INPE

اثبت النص باللغة العربية لاستخدام الأداة.
Brazil has successful examples of how to convert knowledge into wealth.
Examples of positive impact of ST&I in the success of the current Brazilian economy
Brazil - examples of successful implementation of the ST&I policy

Examples of positive impact of ST&I in the success of the current Brazilian economy.

World leader in deep sea drilling
Brazil - examples of successful of the ST&I policy

Examples of positive impact of ST&I in the success of the current Brazilian economy

Prof. Richard H. Smith, head of the Department of Aeronautics at MIT
Embraer has become one of the leading aircraft manufacturers in the world by focusing on specific market segments with high potential for growth in commercial, defense, and executive aviation.
Brazil - examples of successful of the ST&I policy

Examples of positive impact of ST&I in the success of the current Brazilian economy

Grand Schools of Agronomy

IAC

USP

Esalq

Embrapa

UFU
Brazil is the world leader in R&D in tropical agriculture.

Scientific papers in trans-disciplinary agriculture: 9% of the world.

Examples of positive impact of ST&I in the success of the current Brazilian economy.

<table>
<thead>
<tr>
<th>Product</th>
<th>World Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar, Orange Juice, Coffee</td>
<td>1º</td>
</tr>
<tr>
<td>Soybeans, Beef, Poultry</td>
<td>2º</td>
</tr>
<tr>
<td>Corn, Fruits</td>
<td>3º</td>
</tr>
</tbody>
</table>
Brazil - examples of successful ST&I policy

**Sugarcane Bioethanol for Vehicle Fuel**

- First experiments date back to 1925
- Proálcool (1975): bioethanol blended in gasoline (25%)
- Flex-fuel engines (gasoline, bioethanol or any mix) introduced in 2003
- 90% of all cars sold are flex-fuel
- Total bioethanol today equals the amount of gasoline
Brazil - examples of successful ST&I policy

Sugarcane Bioethanol for Vehicle Fuel

Brazil produces about 30 billion liters of ethanol from sugar cane per year, 7.2 thousand liters of ethanol per hectare at a price lower than $0.60 per gallon (3.6 L).

For the production of 8 units of energy as ethanol (sugarcane) it consumes 1 unit of energy.
Science, Technology and Innovation for National Development
ST&I Policy dimensions

- Social
- Economic
- Scientific and technological
ST&I Policy challenges

- Placing Brazil among the countries with the highest development in ST&I
- Improve institutional conditions for increasing productivity of innovation
- Reduce regional disparities in production and access to ST&I
- Strengthening the basis for promoting sustainable development
- Develop innovative solutions for productive and social inclusion
ST&I Policy - Axis

- Human Resources
- Research and Infrastructure
- Innovation
- Financing
- Legal Framework
Some priority issues

Water  
Food  
Energy  
Climate  
Health  
Biomes and Bioeconomy  
Digital Economy and Society  
Enabling and Converging Technologies  
Aerospace and Defense  
Nuclear  
Social Sciences and Technologies
Puente hacia el futuro

Education, Science, Technology, Innovation and Communications is the bridge to a future of economic and social development.
Thank you!

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