



Foresight - between science and fiction  
3rd annual iFQ conference 2008

# **Foresight in Latin America Experiences in six Countries**

**Argentina, Brazil, Chile, Colombia , Peru , Venezuela**

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Venezuela**

**Bonn, 11th and 12th of December 2008**

# Outline

- **1 Chronology of TF Activities**
- **2 Foresight Programmes**
- **3 Comparing foresight 'style'**
- **4 Obstacles**
- **5 Success Factors**

# 1 Chronology of TF Activities

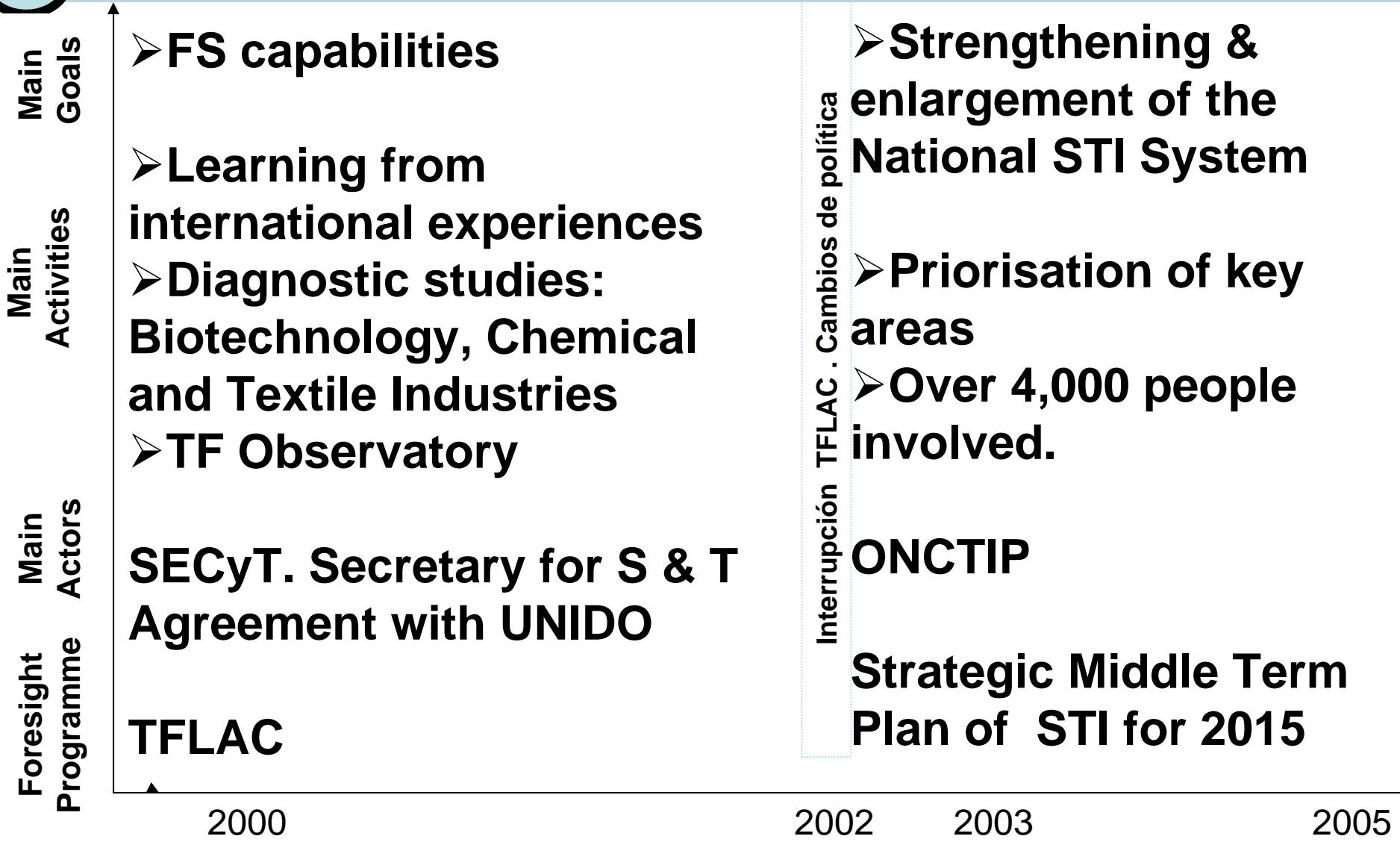
Year	Country	Exercise/Programme	Methods
2000	Brazil Brazil	Prospectar TFP Brazil	Delphi Delphi + Others
2001	Venezuela Chile	TFP Venezuela <b>1<sup>st</sup> Cycle</b> TFP Chile	Delphi Delphi
2002	Colombia	TFP Colombia <b>1<sup>st</sup> Cycle</b>	Delphi + Others
2004	Venezuela	TFP <b>2do Cycle</b>	Others
2005	Colombia	TFP Colombia <b>2<sup>nd</sup> Cycle</b>	Delphi + Others

**Others: Scenarios, panels, roadmapping, critical technologies.**

**Years: Significant activity**

2.1

ARGENTINA





**CHILE**

2.3

Main Activities and Goals

Main Actors

Foresight Programme

- **Identification of S&T areas** focused on specific sectors and themes.
  - e-ducation industry': ICT applied to Education
  - aquaculture industry
  - wine production and exports
- **Biotechnology** applied to
  - Horticulture
  - Forest industry
- The Chilean **software industry**.
- **Expert database**: 180 specialits/exercise

**Ministry of Economy**  
**Public and private sectors**

- TFP**
- **Discovery of pathways** toward a desired future
  - **Identification of strategies or action plans** for its achievement.

- Three Studies:**
- Post-graduate knowledge and skills required by the food industry productive chain
    - of **crop products**
    - of **livestock products**
  - The development of the **Maule Region** in the next 10 years.

➤ **Ministry of Economy**

➤ **The Chilean TF Programme**

2001 - 2005

2006

2.4

COLOMBIA

Main Activities and Goals	<ul style="list-style-type: none"> <li>➤ International Conference</li> <li>➤ FS capabilities</li> <li>➤ Key stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>➤ FS capabilities</li> <li>➤ 1<sup>st</sup> calls for proposals:</li> <li>➤ FS on economic sectors; Regional Cluster &amp; Productive Chains</li> </ul>	<ul style="list-style-type: none"> <li>➤ Centres of Excellence</li> <li>➤ Technology Watch and Thematic FS</li> <li>➤ National System of ST&amp;I</li> </ul>	<ul style="list-style-type: none"> <li>➤ Evaluating</li> <li>➤ Promoting “foresight culture”.</li> <li>➤ Identifying critical factors affecting practices</li> </ul>				
	Regional Prospective Agendas 2001-2007. Strategic plans in 20 Universities							
Main Actors	<ul style="list-style-type: none"> <li>➤ Ministry for the Economic Development</li> <li>CAF, UNIDO, UniValle, CNPQ</li> </ul>	<ul style="list-style-type: none"> <li>➤ Colciencias, CNP, SENA, CAF, CAB</li> <li>20 Universidades</li> <li>Cámara de Comercio</li> <li>•Regional Government</li> <li>Commerce Chamber</li> </ul>	<ul style="list-style-type: none"> <li>➤ Colciencias</li> <li>➤ UniValle</li> <li>➤ Manchester University</li> <li>➤ CE</li> <li>➤ SELF-RULE</li> </ul>	<ul style="list-style-type: none"> <li>➤ UniValle</li> <li>➤ Manchester University</li> <li>➤ International stakeholders</li> </ul>				
	Foresight Programme	Genesis of the CTFP	First Cycle CTFP	<div style="border: 1px solid black; padding: 5px; display: inline-block;">SELF RULE (2005-2007)</div>				
	2001	2002	2003	2004	2005	2006	2007	2008

➤CTFP Colombia Technology Foresight Programme // CNPQ. Centre of Productivity  
➤Colciencias Colombia Office of S&T

Popper and Medina, 2008  
dos Santos and Fellows 2008

PERU

2.5

Main Activities and Goals  
Main Actors  
Foresight Programme



2.6

VENEZUELA

Main Activities and Goals

- Multi-region FS on Yucca sector
- Pilot study in Petroleum industry
- National Inventory
- Capacity-building workshops for the Regional S&T Offices
- International FS participations.

Main Actors

MCT, UNIDO, PDVSA

Foresight Programme

1<sup>st</sup> cycle.  
PNPCyT TFP in ST

Suspended FS activities. Political problem

- National STI Plan 2005-2030
- FS on biotechnology for agro-food security 2011
- Definition of STI-Strategic plans in 6 categories
- More than 1300 participants
- FONACYT, IVIC, INTEVEP, MCT, FUNDACITES, CE Universities

- Industrial Development Network in Orinoco Apure Exes
- Capacity-building in Orinoco Apure economic sector.
- Social inclusion. Endogenous development programmes

- Ministry of Social Security, UNESR, UBT, UBV, CE Regional Government (4), Social Productive Network, ALCASA .

SELF RULE Network (2005-2007)

**2<sup>nd</sup> Cycle. The National Plan 2030**

- 3<sup>rd</sup> Cycle.
- Industrial-Academic

2000      2002      2003      2004      2006      2007      2008

2.6

**SELF RULE Network (2005-2007)  
COORDINATED FROM VENEZUELA**

**The Euro-Latin Foresight Network**



Latin America

Europe

Brazil  
Colombia  
Peru  
Venezuela

Finland  
Spain  
Hungary  
United Kingdom

**EU-LA Academic Network  
Objectives**

- Exchange FS knowledge, tools & experiences
- Build FS capacity
- Articulate with ST&I stakeholders
- Contribute to regional development

**Responsible: Yuli Villarroel**

Scientific Committee: **Rafael Popper, Michael Keenan**

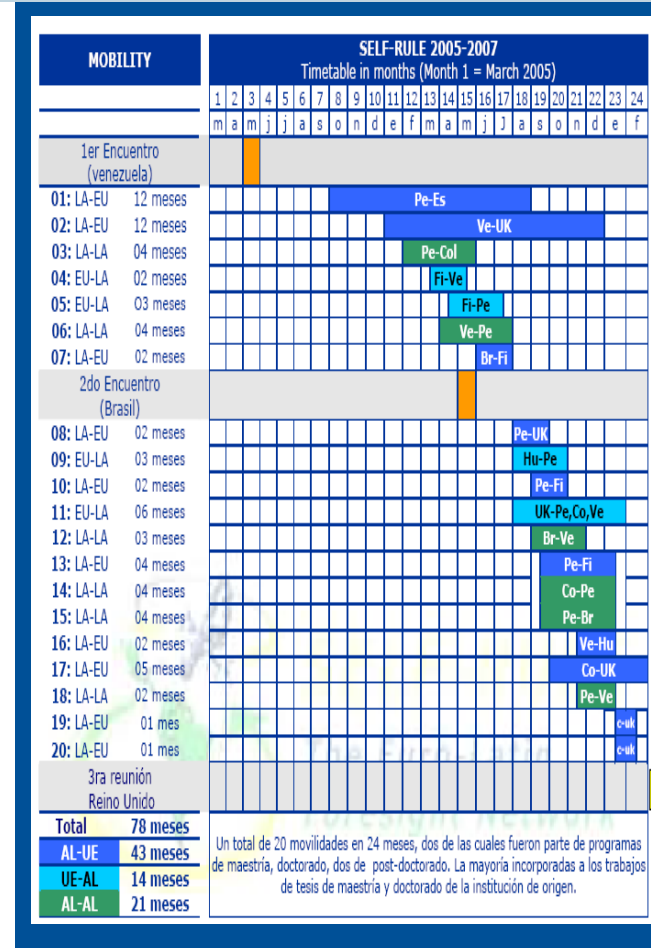


**SELF RULE Network (2005-2007)  
COORDINATED FROM VENEZUELA**

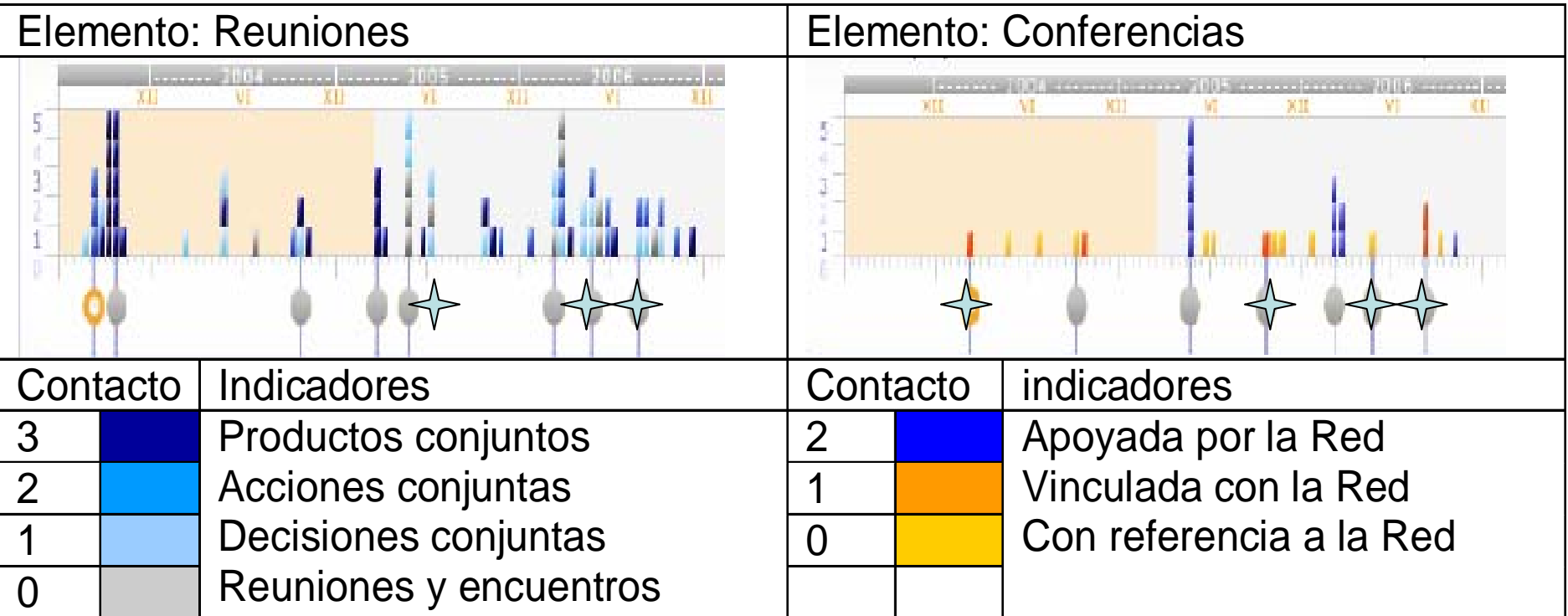
**THE MAIN SELF-RULE PRODUCTS**

- Self Evaluation using the life-lines of researchers
- Bringing new actors into the strategic debate
- Identifying new opportunities in foresight cooperation
- 3 research areas
- Cooperation agreements between the institutions involved in the 20 movilities
- Strategic cooperation: CGEE, 4-SIGHT-GROUP Think Tank
- Considered amongst “The Best Practices of Alfa 2 Projects”.

(European Conference, Mexico , 21-22 May 2007)



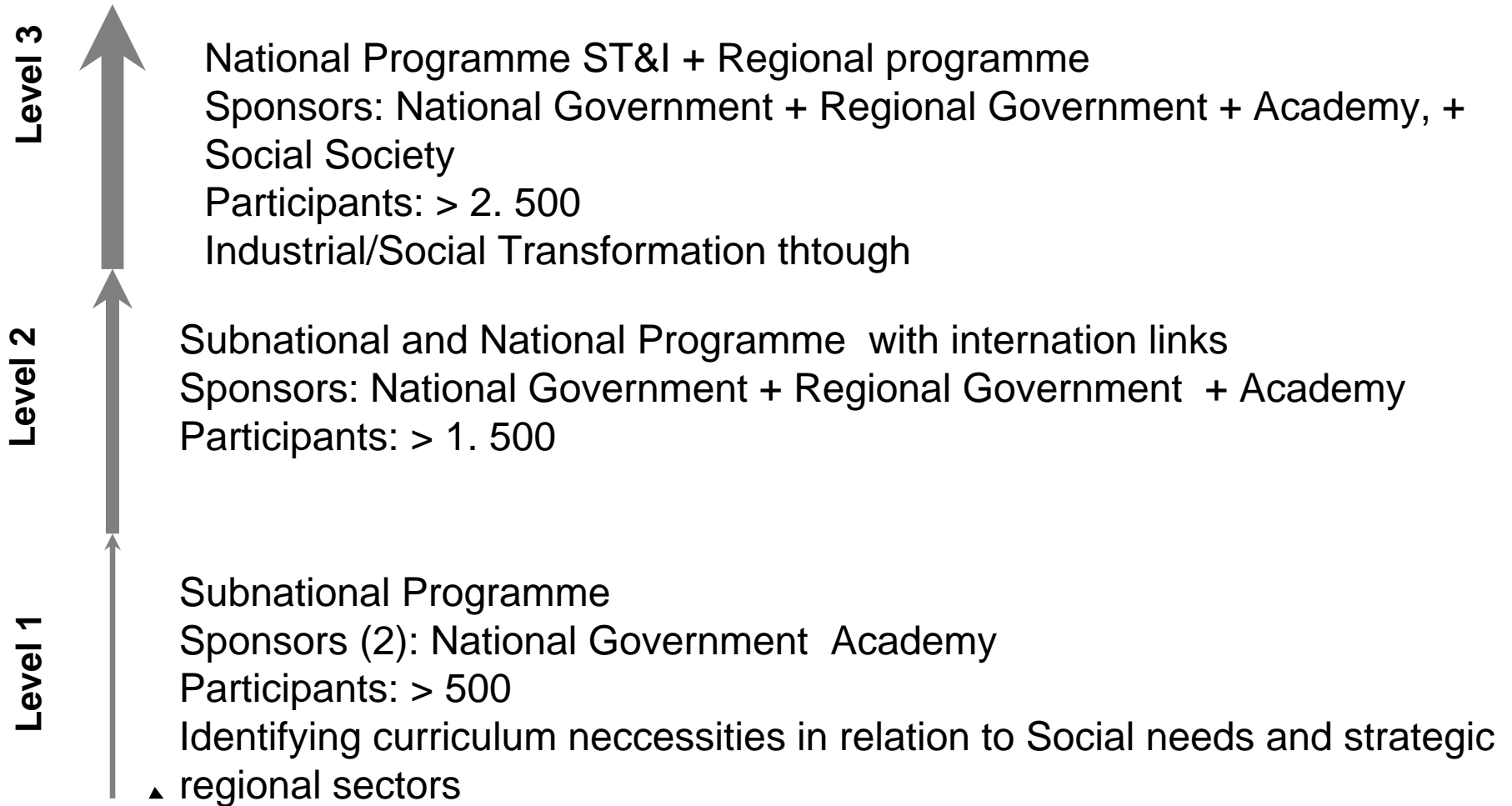
**SELF RULE Network (2005-2007)  
COORDINATED FROM VENEZUELA**



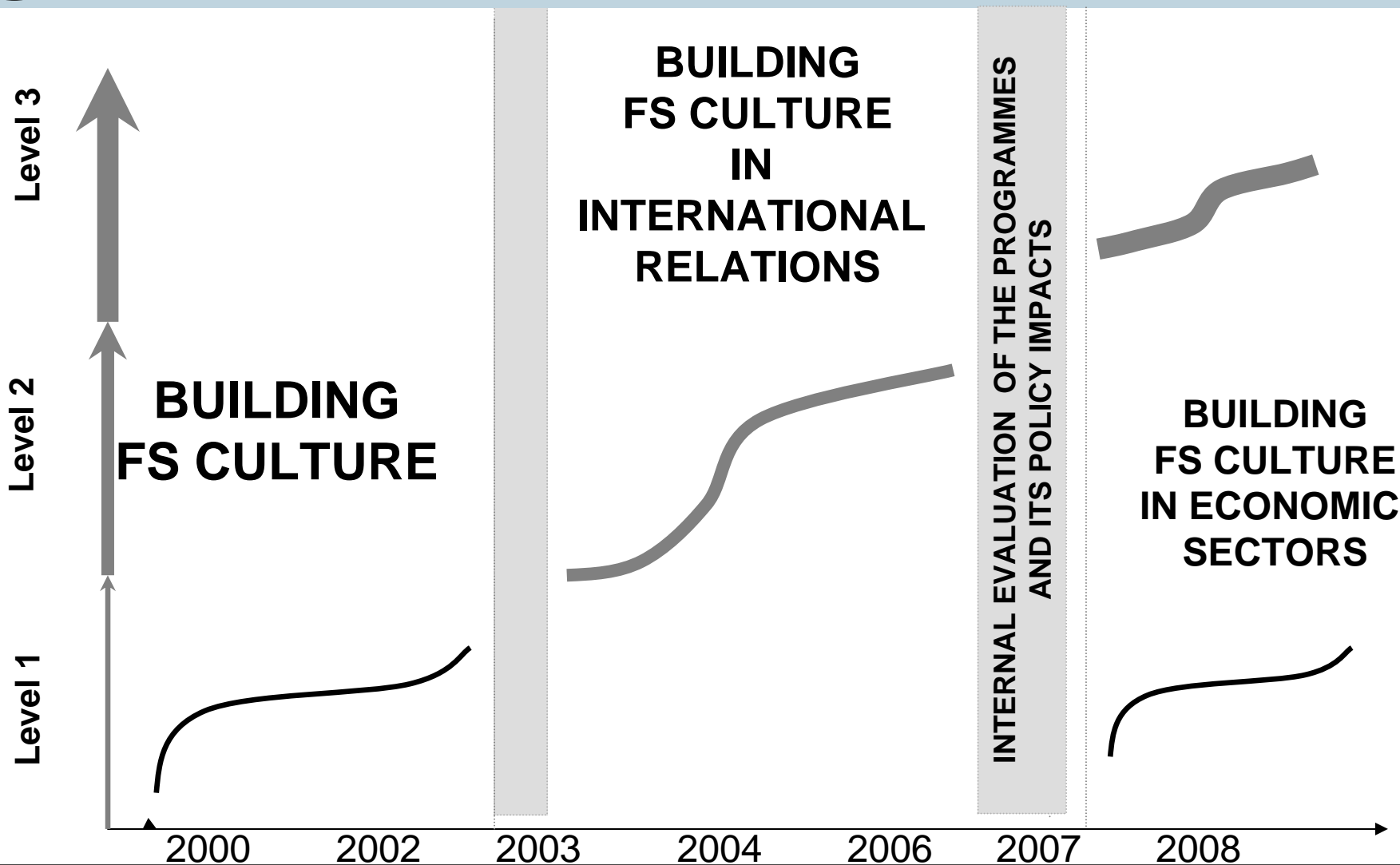
- Determinista. Programado inicialmente por la red
- No Determinista: Producto de 3er orden de contactos surgidos en la red
- Potenciales creadores de futuro, prolongan la vida de la red

Villarroel, 2008

## Foresight Overview in Venezuela

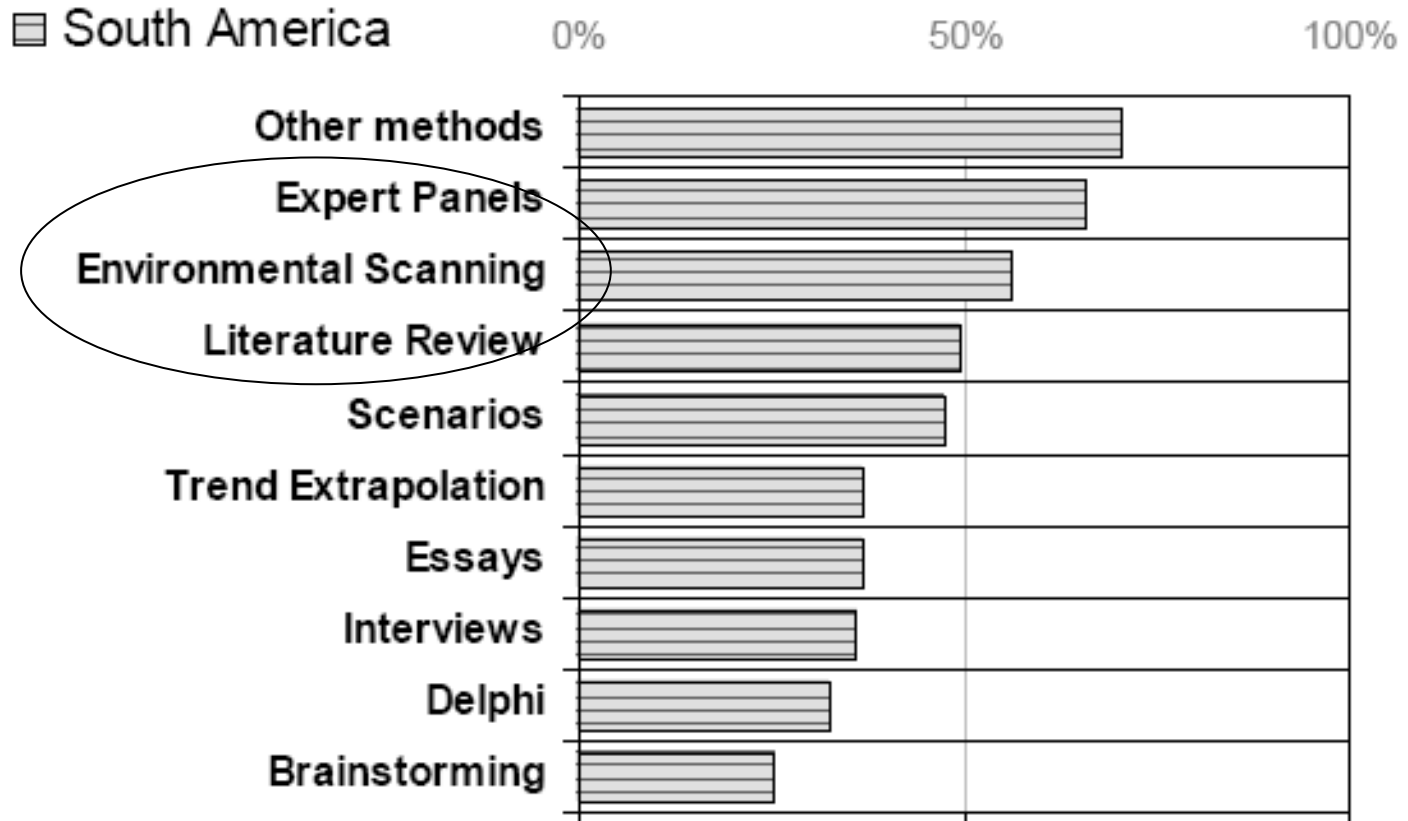
**TEMPORAL EVOLUTION / DEVELOPMENT LEVEL**

## Foresight Overview in Venezuela



## Comparing foresight 'style' in six AL Countries

### Use of Methods

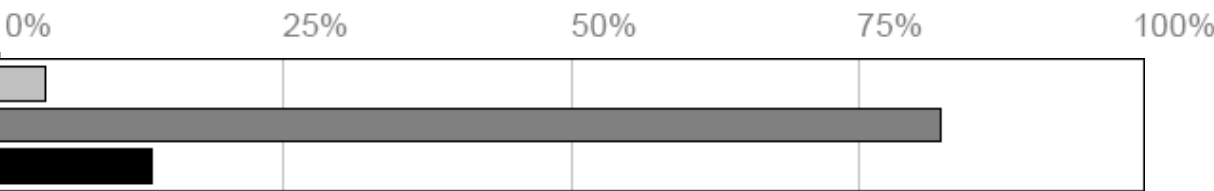


Sources: 114 cases from SELF-RULE (2008)

2.7

## Comparing foresight 'style'

### Territorial scale (117 cases)

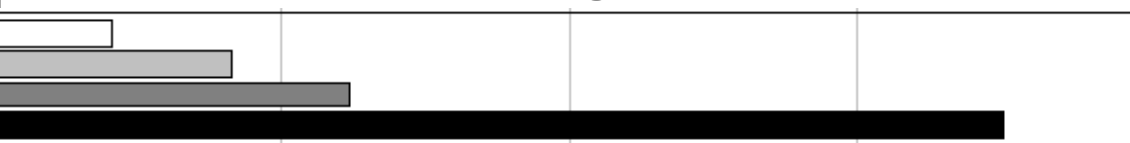


■ Sub-national

■ National

■ Supra-national

### Sponsors of Foresight (107)



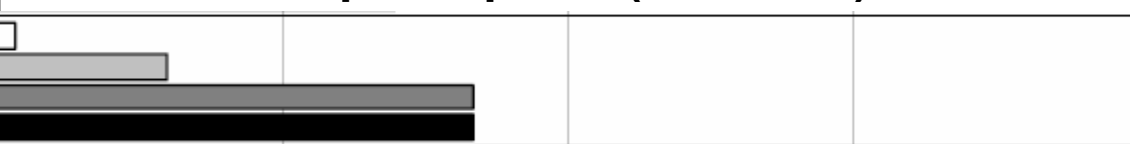
■ Government

■ Non-State Actors

■ Research

■ Business

### No. of participants (60 cases)



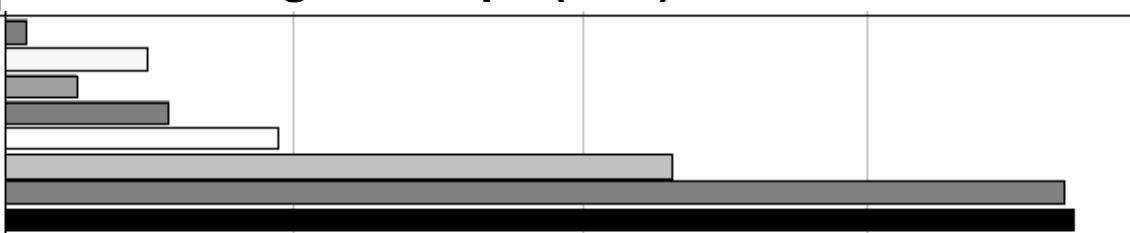
■ < 50

■ 51-200

■ 201-500

■ > 500

### Target Groups (114)



■ Govt Agencies / Depts

■ Firms

■ Other target audiences

■ NGOs

■ Research Community

■ Trade Bodies / Industrial Federations

■ Intermediary organizations

■ Trades Unions

Argentina: 6

Brazil: 15

Chile: 10

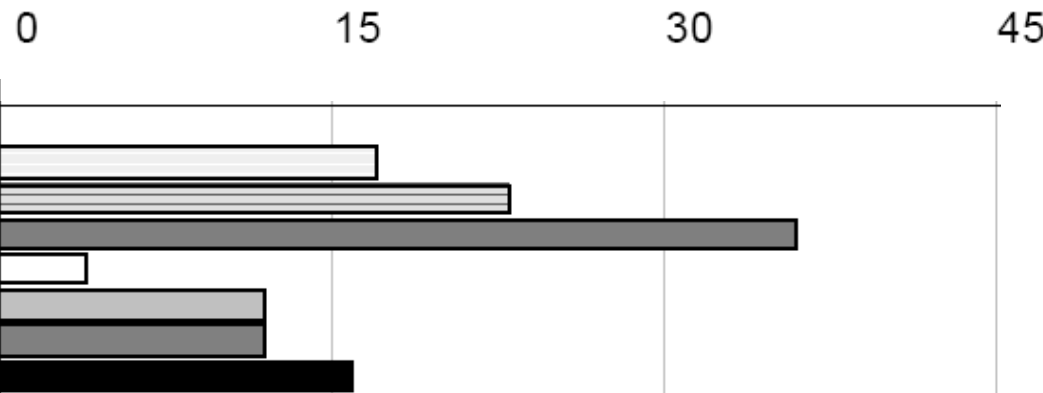
Colombia: 35

Peru: 3

Venezuela: 45

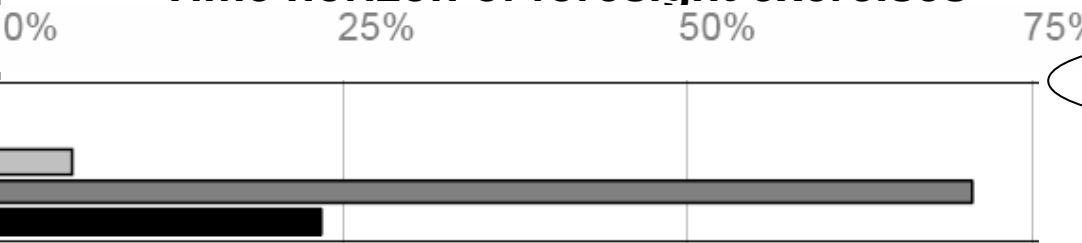
## Comparing foresight 'style'

### NACE coverage foresight exercises



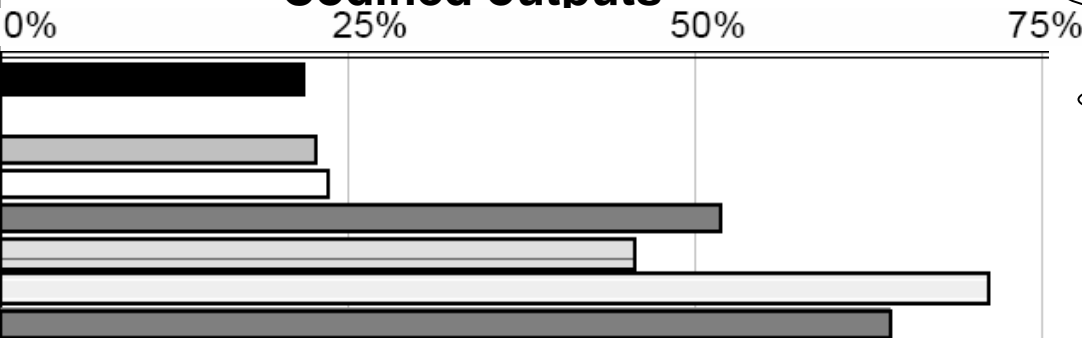
- Manufacturing
- Electricity, gas and water supply
- Agriculture, hunting and forestry
- Education
- Health and social work
- Transport, storage and communication
- Public administration and defence
- Construction

### Time horizon of foresight exercises



- until 2010
- 2011-2020
- 2021-2030
- 2031-2050

### Codified outputs



- Policy Recommendations
- Scenarios
- Lists of Key Technologies
- Technology Roadmaps
- Analysis of Trends and Drivers
- Research and Other Priorities
- Forecasts
- Others

# The Main Obstacles

- 1. Economic Crisis and political instability (Mari, 2008)**
- 2. Discontinuity produced by change of government (dos Santos and Fellow, 2008).**
- 3. Internal Problems of the host organisation of the project (Mari, 2008).**
- 4. Innovation system designed by political actors (Chile, Bronfman, 2008)**
- 5. Management difficulties of multidisciplinary projects (Brazil. dos Santos and Fellow, 2008).**

- 1. Bringing new actors into the strategic debate.**
- 2. Increasing in the number of countries that have launched TF programmes.**
- 3. Increasing in the number of countries using TF as instrument for:**
  - a) Identification of emerging areas and strategic sectors**
  - b) Identification of future opportunities**
- 4. Theoretical and methodological training courses for practitioners and users of foresight**
- 5. Improving policy-making and strategy formation in area where science and innovation play a significant role**

3

## Success Factors

1. **Government and Academic Sponsors.**
2. **TF used as instrument for directing or prioritising investment in STI.** (Popper and Medina, 2008)
3. **Use of technology in incrementing participation**
4. **Contacts strength of project managers.**
5. **Effective innovations in practices and tools.** (Popper and Medina, 2008)
6. **Theoretical and methodological training courses for practitioners and users of FS.**
7. **Renovation toward new development levels.**

## **Driver, since 1970**

### **THE CREATION OF MAJOR CENTRES**

<b>1. Bariloche Group</b>	<b>Argentina</b>
<b>2. Javier Barros Sierra Foundation</b>	<b>Mexico</b>
<b>3. Centre for Development Studies</b>	<b>Venezuela</b>
<b>4. The S&amp;T Observatory (OCCT)</b>	<b>Cuba</b>
<b>5. The Centre for Management and Strategic Studies (CGEE)</b>	<b>Brazil</b>
<b>6. National Institute of Foresight Innovation and Knowledge Management, Colombia</b>	<b>Colombia</b>

## Quotations

**... “Latin America has managed to achieve its own ‘Latin Flavour’ ... “effective innovations in practices and tools”**

**Popper and Medina, 2008**

**“It is necessary to create a dynamics in Latin American countries promoting foresight studies, in order to foster a common framework of reference, and promote the approximation between science, technology and innovation”**

**dos Santos and Fellows, 2008**



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THANK YOU



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## The SELF-RULE Network

Programma ALFA. Subprogramma B. No. SCR.504792.1 B2005

### Factores de Éxito (2/2)

MORE ABOUT THE  
PROGRAMMES



1

**Foresight Programs.** Argentina, **Brazil**, Chile, Colombia, Peru, Venezuela

## Main actors

MST, MDIC, NAE, FINEP, CNPq

UNIDO link (with MDIC)

UFRJ, UNICAMP, USP, among others

CGEE

European Commission ALFA 2 Programme (SELF-RULE network)

## Main objective

To inform both government and industry about possible impacts of S&T trends

## Main methods

Brainstorming

Delphi

Prioritisation workshops and surveys

Scenarios & cross-impact

## Main activities

SAE/Brazil 2020 (1990s)

MDIC / BTFP (2002)  
2022

CGEE (2001-2007)

MST / PROSPECTAR (2002)

NAE / Brazil (2004) 3 Tempos, 2007, 2015,

## **Brazil: PROSPECTAR Programme (2001)**

### **Main actors**

MST, National Council of S&T (CCT) + Anchor Institutions, CNPq, Fund for National Studies & Research (FINEP) & a team from the Centre of Advanced Studies and Systems of Recife (CESAR), European Commission ALFA 2 Programme (SELF-RULE network)

### **Main objectives**

To examine macro-issues related to STI with a focus on technological trends and inform key stakeholders about the future impacts of trends

### **Main methods**

Brainstorming & prioritisation  
Delphi

### **Main areas**

Agriculture; Health; Energy; Telecommunications and IT; Materials; Hydro resources; Aeronautics; and Space

### **Main remarks**

The massive mobilisation of the scientific community (>10k people)  
The programme raised awareness of the challenges Brazil was facing as a deration & raised the importance of Foresight in the scientific community

## Brazil: The BTFP Programme (2002)

### Main actors

Secretary of Industrial Technology (STI) at the Ministry of Industry, Development and Commerce (MIDC)

UNIDO, EMBRAPA + Anchor institutions

### Main objective

To contribute to development of the productive sector

### Main methods

Foresight techniques applied to productive chain methodology

modelling; segmentation; performance indicators; critical factors; future events; Delphi survey + scenarios & cross-impacts (optional)

### Main areas

Civil construction; Textiles & clothing; Plastics; and Wood & furniture

### Main remarks

The methodological approach proved to be useful to understand the complexity of long-term planning on issues concerning a large variety of market segments and stakeholders (from raw material producers to final consumers).

## **Brazil: NAE activities (2004)**

### Main actor

Nucleus of Strategic Issues (NAE) of the Presidency of the Republic

### Main objective

to define national objectives based on a large-scale dialog between different stakeholders of society

### Main methods

Trends & issues. 600 experts looking for Megatrends in 7 dimensions: Institutional; Economic; Socio-cultural; Territorial; Knowledge; Environment; and Global

From 50 strategic themes to strategic goals & objectives

Strategic Focus (cross-impact + Delphi + Scenarios)

### Main projects

Improving the quality of basic and primary education

### Main remarks

Results are still being processed but the response rate has been very satisfactory (around 38,000 participants)

## Brazil: CGEE activities (2001-2007)

### Main actors

CGEE + sponsors + other relevant stakeholders

### Main objective

To support and execute foresight activities in Brazil

To raise awareness of about the future of key sectors

### Main methods

Brainstorming surveys

Workshops

Delphi

### Main projects

Energy, Biofuel, Biotechnology, Nanotechnology, Climate Change, and Water Resources, among others

### Main remarks

Companion-system

Innovation portal

Delphi system

### Main actors

Colciencias, National Centre of Productivity (CNP), SENA  
UNIVALLE, Externado  
CAF, CAB, UNIDO  
European Commission ALFA 2 Programme (SELF-RULE network)

### Main objectives

Building capabilities & foresight culture  
Fund and execute exercises

### Main methods

Brainstorming, Surveys, Panels, SWOT, Delphi, cross-impact  
Scenarios & recommendations

### Three Cycles of CTFS

First (2003-2004)	Second (2005-2006)	Thirst (2007-2008)
Building FS capabilities Two calls for proposals 1. FS on economic sectors 2. Regional Cluster & Productive Chains	Assistance to exercises under 2 <sup>nd</sup> called National Centres of Excellence Thematics Areas of the National System of STI.	Evaluation Identify critical factors affecting current practices

First (2003-2004)	Second (2005-2006)	Thirst (2007-2008)
<p><b>Building FS capabilities</b></p> <ul style="list-style-type: none"> <li>➤ Seminars, congresses, training courses</li> </ul> <p><b>1<sup>st</sup>. Call for proposals</b></p> <ul style="list-style-type: none"> <li>➤ Electrical sector</li> <li>➤ Food packaging sector</li> <li>Dairy sector</li> </ul> <p><b>2<sup>nd</sup> Call proposals (2004)</b></p> <ul style="list-style-type: none"> <li>➤ Health sector cluster in the Cauca Valley</li> <li>➤ Agro-industrial productive chain in Santander</li> <li>➤ Horticulture in Bogota plains</li> <li>➤ Tourism in Cartagena</li> </ul>	<p>Identification of strategic economic sectors</p> <p><b>Centres of Excellence</b></p> <p>(4) Technology Watch and Thematic FS exercises:</p> <ul style="list-style-type: none"> <li>➤ New materials</li> <li>➤ Tuberculosis</li> <li>➤ Genetic resources and biodiversity</li> <li>➤ Natural products and oils</li> </ul> <p><b>Areas related with Nacional System of ST&amp;I</b></p> <ul style="list-style-type: none"> <li>➤ Energy and materials</li> <li>➤ Agricultural products</li> </ul> <p><b>EU-LA SELF-RULE Network</b></p>	<p><b>Evaluation</b></p> <ul style="list-style-type: none"> <li>➤ Interaction with international stakeholders</li> <li>➤ Promotion the “foresight culture”</li> <li>➤ Identifying critical factors affecting current practices</li> </ul>

### First Cycle of the Colombian Foresight Programme (2003–04)

P1	Colombian Milk Sector	sectoral
P2	Colombian Electricity Sector	sectoral
P3	Colombian Food Packaging Sector	sectoral
P4	Tourism Sector in Cartagena City	secto-territorial
P5	Health Cluster of the Cauca Region	secto-territorial
P6	Horticulture in the Bogota Plains	secto-territorial
P7	Vegetable Fibres in Santander Region	secto-territorial
P8	National Biotechnology Programme	thematic

### Colombian Foresight Programme (2nd Cycle)

1

Second Cycle of the Colombian Foresight Programme (2005–07)		
P9	Colciencias: Productive Transformation of Colombia into a Knowledge Economy	Environmental Scanning + Foresight (ESF)
P10	Colciencias / DNP: National STI Plan – Colombia Vision 2019	
P11	Colciencias / MCIT: Micro-Small-and-Medium Enterprises Fund (Fomipyme)	
P12	Colciencias / C. Excellence: Tuberculosis	
P13	Colciencias / C. Excellence: New Materials (Hardening Surface)	
P14	Colciencias / C. Excellence: Essential Oils and Natural Products (Medicinal Plants)	
P15	Colciencias / C. Excellence: Genetic Resources and Biodiversity (Black Sigatoka in Plantain)	
P16	Colciencias / C. Excellence: Culture, Development and Peace	
P17	Colciencias / EAAB / EPM: Pilot on the Water Recycling Cluster	
P18	Colciencias / CIDET: Pilot on the Electricity Cluster	Environmental Scanning (ES)
P19	Colciencias Programmes: Biodiesel Production Technologies	
P20	Colciencias Programmes: Bioinputs (e.g. biofertilizers)	
P21	Colciencias Programmes: Electronics Applied to Agriculture	
P22	Colciencias Programmes: Nanotechnology Manufacturing Methods	
P23	Colciencias Programmes: Malaria Vaccines	
P24	Colciencias Programmes: Social Conflicts Resolution	
P25	Colciencias: National Capacities in Higher Education, Research and Innovation	Environmental Scanning + Productive Chain Foresight (ES-PCF)
P26	Colciencias / MADR: Furniture and Wood Products	
P27	Colciencias / MADR: Cacao and Chocolate	
P28	Colciencias / MADR: Dairy Products	
P29	Colciencias / MADR: Tilapia Fish	
International Networks Projects		
P30	Productive Transformation and Higher Education in CAB countries (SECAB)	ESF
P31	Scenarios for Research and Technology Development Cooperation with Europe (SCOPE)	
P32	Strategic Euro-Latin Foresight Research and University Learning Exchange (SELF-RULE)	

### **Main actors**

- MCT, CENDES, IESA,
- UNIDO, European Commission ALFA 2 Programme (SELF-RULE network)
- UCV, UNEFM, UNEFA, UNESR, 4-sight-group, UNESR

### **Main objectives**

- Building capabilities & foresight culture + execute exercises
- Promote endogenous development, social inclusion & technological sovereignty

### **Main methods**

- Brainstorming, Surveys, Panels, SWOT, focus groups, community dialog, Interviews

### **Main activities**

- Yucca in Gondola
- Shared Vision of the Future of the Gas Industry
- Scenarios for the Agro-biotechnological Development of the Country
- Foresight on Biotechnology for Agro-Food Security by 2011

## **2004. National Plan for STI 2005-2030**

### Main actors

- FONACYT, IVIC, INTEVEP, CDCH, MCT, FUNDACITES, universities

### Main objectives

- To build an evaluation & promotion system for new stakeholders
- To relate STI results to the needs of most excluded people
  - To promote a selective assimilation of technologies
  - To promote pertinent technological developments

## **2006-2008. Social inclusion through endogenous development programmes**

### Main Actors

- Simón de los Pueblos 2008-2013. UNESR y Gobiernos Locales
- ReDI2013. VISION 2013 DE RED DE DESARROLLO INDUSTRIAL INTEGRAL EJE APURINOCO. Participación de Ministerio de Seguridad Social, UNESR, UBT, UBV, Gobernaciones de Portuguesa, Cojedes, Apure, Mérida, ALCASA, RIALCA, Redes Sociales de Producción.



1

## Foresight Programs. Argentina, Brazil, Chile, Colombia, Peru, Venezuela

### Main actors

- MCT, CENDES, IESA,
- UNIDO, European Commission ALFA 2 Programme (SELF-RULE network)
- UCV, UNEFM, UNEFA, UNESR, 4-sight-group, UNESR

### Main objectives

- Building capabilities & foresight culture + execute exercises
- Promote endogenous development, social inclusion & technological sovereignty

### Main methods

- Brainstorming, Surveys, Panels, SWOT, focus groups, community dialog, Interviews

### Main activities

- Yucca in Gondola; Shared Vision of the Future of the Gas Industry; Scenarios for the Agro-biotechnological Development of the Country; and Foresight on Biotechnology for Agro-Food Security by 2011

### National Plan for STI 2005-2030

#### Main actors

- FONACYT, IVIC, INTEVEP, CDCH, MCT, FUNDACITES, universities

#### Main objectives

- To build an evaluation & promotion system for new stakeholders
- To relate STI results to the needs of most excluded people
  - To promote a selective assimilation of technologies

- [Cartan, E, (1937), Théorie des groupes finis et la géométrie différentielle traitées par la Méthode du repère mobile, Gauthier-Villars, Paris.
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# Europa

Identifying new focuses in R&T

Areas for interdisciplinary activities of research  
in R and innovation

Analyzing fields with the potential for  
strategic partnerships

Deriving priority fields of action for R&D