

# How do research groups cope with Science, Technology and Innovation Policy gaps in Colombia? The case of nanotechnologies

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# Agenda

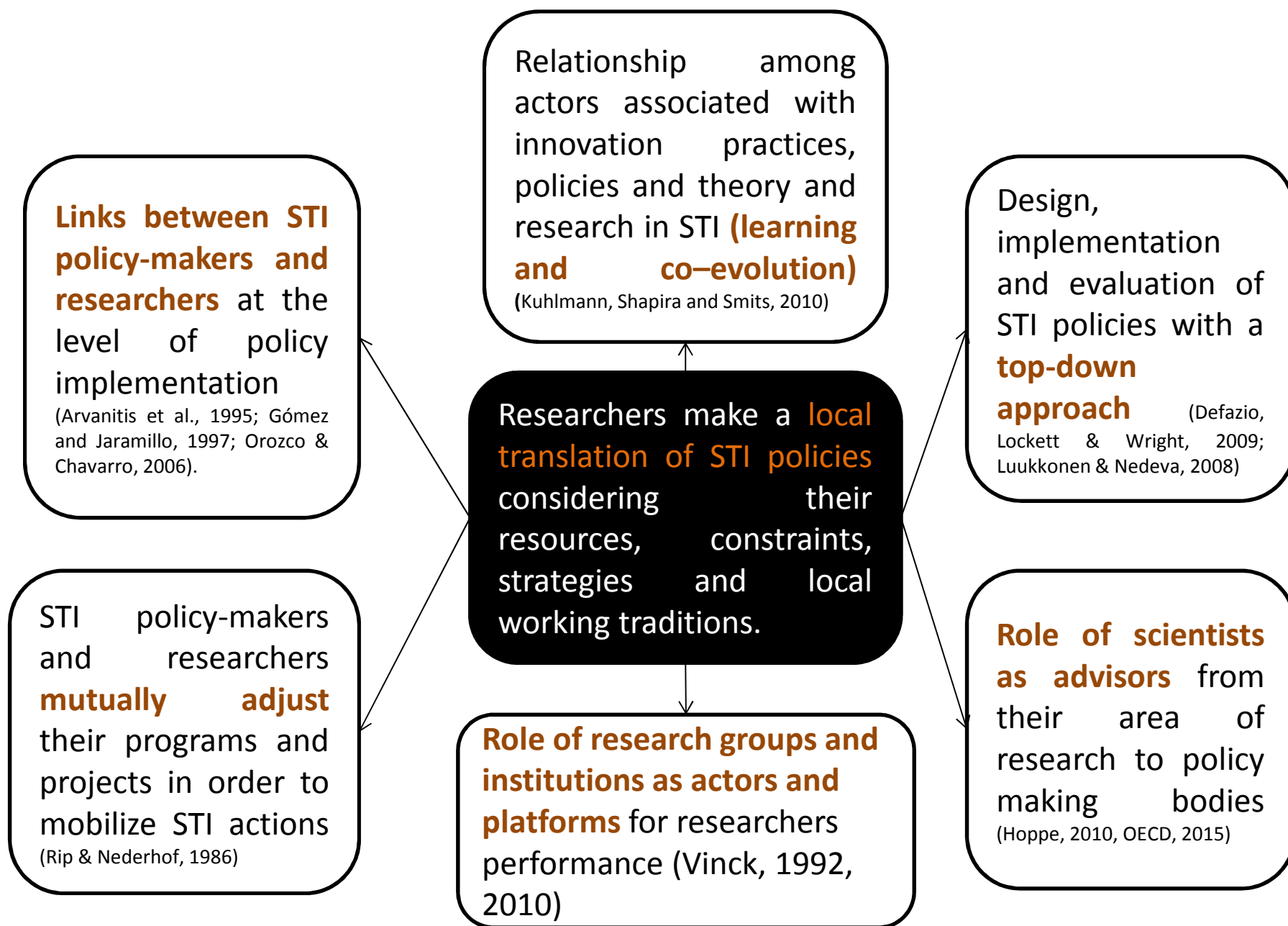






# Introduction





Generally, this literature focuses **on what happens in a particular STI policy or a specific STI instrument.**





Purpose



A **bottom up perspective** to study what happens with researchers and other local actors who face not only a STI policy or instrument, **but several ones at the same time.**

We focus on **practices under which the actors take advantage of STI instruments**, as well as their learning process by having to handle a variety of instruments, which, in some cases, present tensions and contradictions among them.



# Research Question

What are the **'survival' strategies of research groups (RG)** in the context of policies and instruments to promote STI at the national, regional and institutional levels?

We chose to focus on the 'survival' axis because the scarcity of resources emerged as the key issue from the researchers' perspective.



# Methodology

**Bottom up perspective:** A technological development project carried by a RG.

Case research design (Yin, 2014):  
**Research group (Colombian public university)** that develops a technology for decontamination of water based on nanocomposites.

**Collection and analysis of documents** (STI policies, policy instruments, project documents, scientific publications, press releases and work documents)

Fieldwork using **semi-structured interviews**.





Results



Hypotheses 1: “I dance according to the tune” (*“Al son que me toquen bailo”*)

RGs interact with STI policies and have learned to take advantage of them, combining different types of instruments, according to their needs and interests.



# “I dance according to the tune”: Adapting



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*“We adapt our materials for specific applications since cellulosic materials can be used for making catalyzers, for making chemical dispersants, for making surface modifiers, surface tension modifiers, for making membranes; **we have a heart, a core, a core work, which allows us to look for different applications**”* Researcher



# “I dance according to the tune”: Elements of the case



Projects to mobilize resources in the short term, enough to remain active and sustaining other projects with greater long-term potential, **keeping 'alive'** as a group.

The RG shows a **learning process** about how to mobilize various types of resources inside (students, colleagues, among others) or outside the university.

Agendas or topics are developed by "dancing according to the tune", that is, **maintaining a minimum research core but adapting to the changing financing conditions.**




Hypotheses 2: "Performing a juggling act"  
(*"Haciendo malabarismos"*)

Hypotheses 3: "I'm still the king... of juggling"  
(*"Pero sigo siendo el rey... de los malabares"*)

**RGs maintain research lines defined autonomously, which do not depend on STI policy instruments. The leader of the RG plays a specific role in taking advantage of STI policies and articulating them.**



# "Performing a juggling act": Balancing agendas and funding sources



"And then we rely on the resources that come to support a project to permeate other projects of lesser amounts. That allows us to stay up to date and then, when these (other) ideas are consolidated to present to new calls for proposals, where we already have secured results, and where we know we will be successful, then **it is like performing a juggling act...**"

Researcher



In this process, the group leader has learned how to move through the existing policy instruments and balance research agendas and needs.

Researchers and groups learn to diversify their funding portfolio, **"performing juggling acts"** to avoid dropping the core topics while opening up new research possibilities.

Distribution of available resources across areas for which financing is obtained with others that do not have support but which are of relevant to the group (topics being **"cooked at low fire"**). OM

**"Performing a juggling act":**  
**Elements of the case**



## Diapositive 15

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**OMH(1**

No entiendo bien esto.

Ordonez Matamoros, H.G. (BMS); 17/01/2016

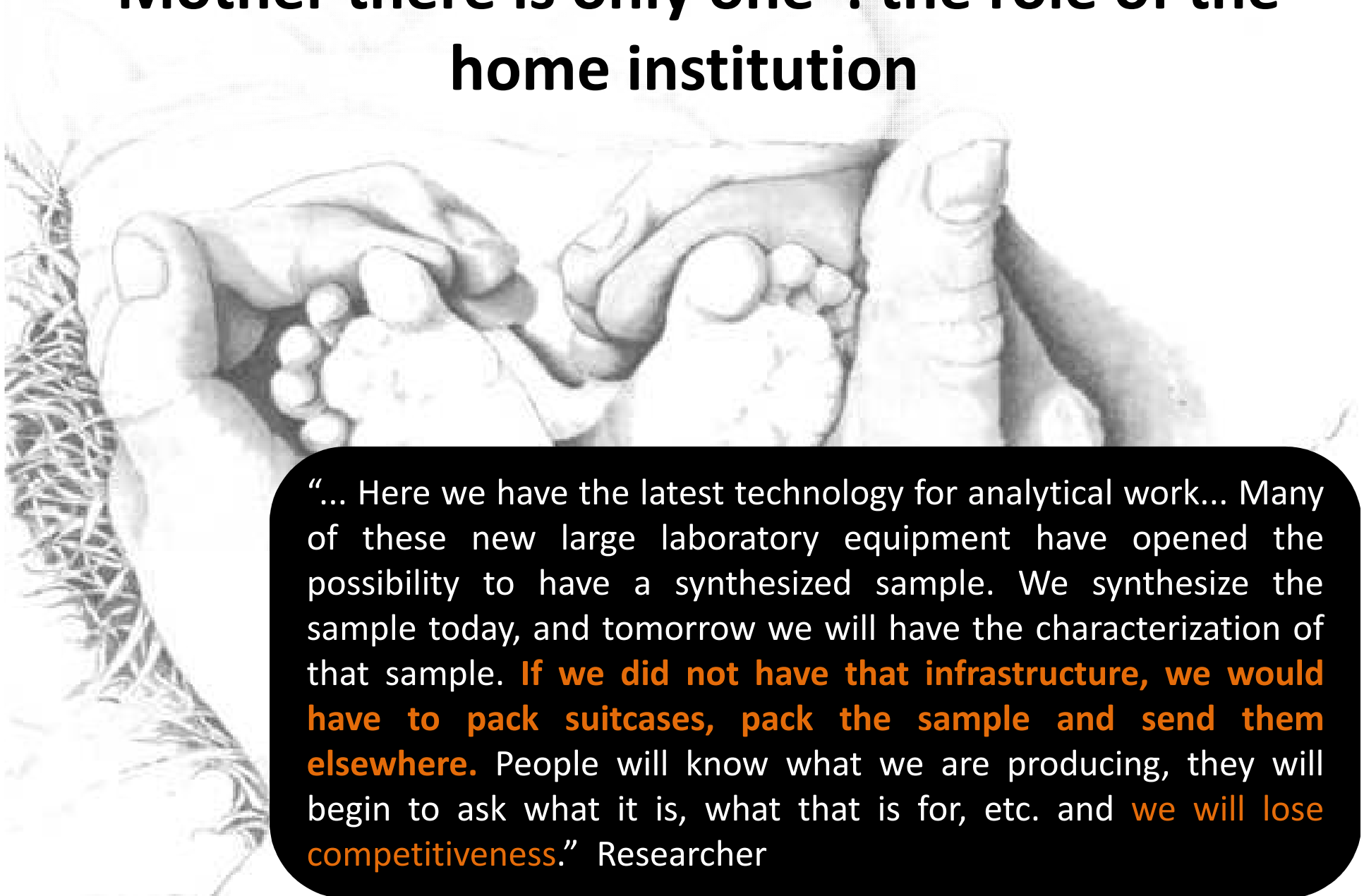


**Hypotheses 4: “Mother there is only one” (“Madre no hay sino una”)**

**The institutions to which RGs belong play an important role in the local reconstruction of STI policies and instruments, filling gaps in policies and instruments at higher levels (regional or national).**

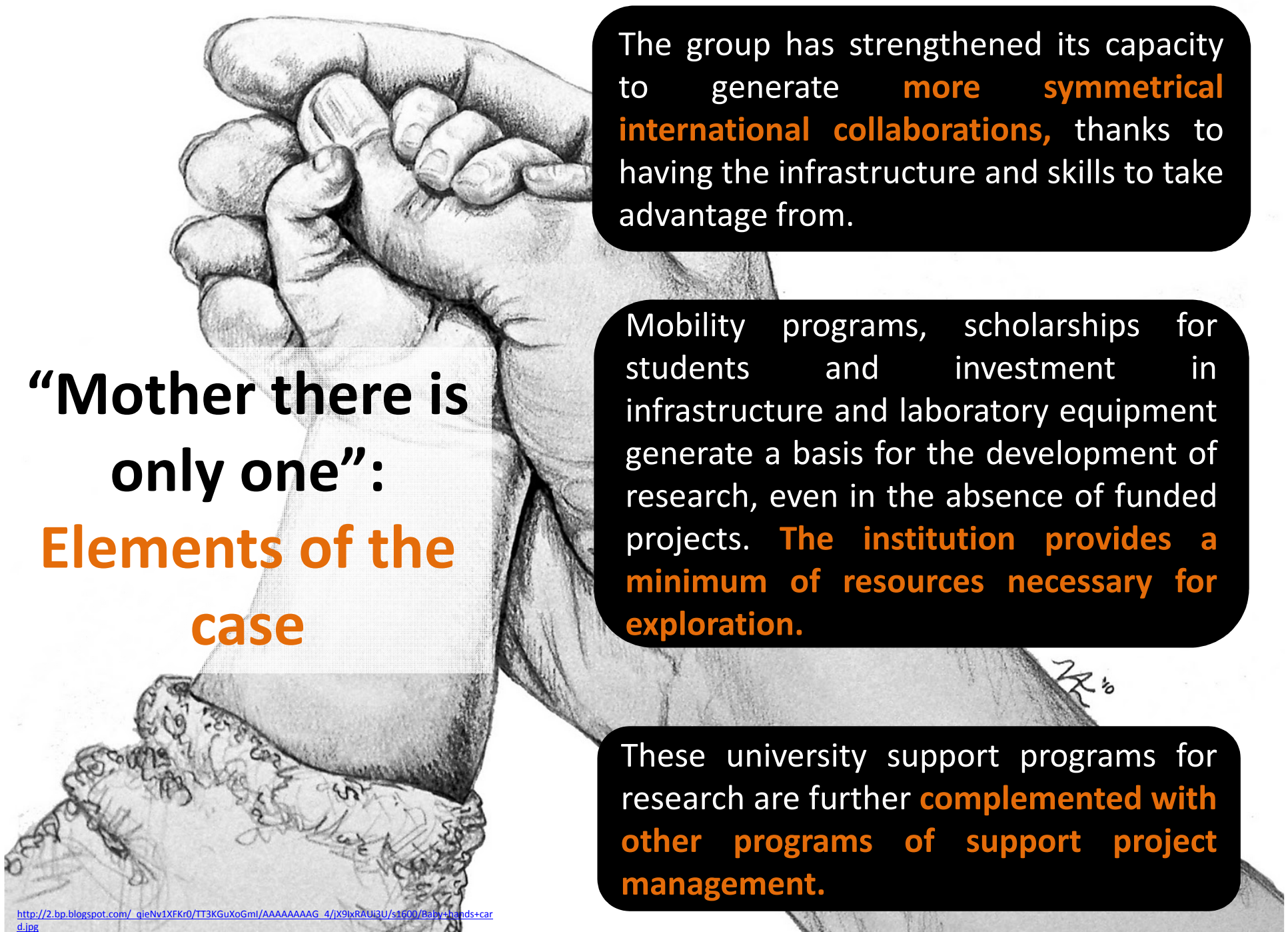


# “Mother there is only one”: the role of the home institution



“... Here we have the latest technology for analytical work... Many of these new large laboratory equipment have opened the possibility to have a synthesized sample. We synthesize the sample today, and tomorrow we will have the characterization of that sample. **If we did not have that infrastructure, we would have to pack suitcases, pack the sample and send them elsewhere.** People will know what we are producing, they will begin to ask what it is, what that is for, etc. and **we will lose competitiveness.**” Researcher





## “Mother there is only one”: Elements of the case

The group has strengthened its capacity to generate **more symmetrical international collaborations**, thanks to having the infrastructure and skills to take advantage from.

Mobility programs, scholarships for students and investment in infrastructure and laboratory equipment generate a basis for the development of research, even in the absence of funded projects. **The institution provides a minimum of resources necessary for exploration.**

These university support programs for research are further **complemented with other programs of support project management.**



Conclusions: **Bottom  
up co-building  
process among  
actors and learning**  
(Part 1)

The ability of researchers and **groups to 'juggle' with policy heterogeneous (and sometimes contradictory) instruments** becomes essential in the current dynamics of STI.

Researchers learn how to "**dance according to the tune**" and take advantage of the partner and melody (policy discourse).

Balance between **exploration and exploitation strategies**.

Role of **social capital** in the capacity of groups **to take advantage of STI policies**.



Conclusions:

**Bottom up co-building process and learning among actors** (Part 2)

**Second-order learning** by research groups and their leaders and institutions

**Focus on a policy, program or project is limited:** significant results require a long-term work in which actors articulate several formal and informal initiatives.

Further studies should be performed with **new cases**. The **bottom up view of the STI policies** provides an interesting avenue for future studies.



**THANK YOU**


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**HUI**  
**YUSPAGARATAM**  
**UNALCHEESH**  
**ATTO**  
**ANHA**  
**SPASIBO**  
**DENKAUJA**  
**NENACHALHYA**  
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**MAKETAI**  
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**SIKOMO**  
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**MEDAWAGSE**  
**BAIUKA**  
**SAICO**  
**MERASTAWHY**  
**GAEJTHO**  
**AGUYJE**  
**FAKAAUE**  
**KOMAPSUMNIDA**  
**MAAKE**  
**LAH**



A black and white photograph of a spiral-bound notebook. The notebook is open, showing a lined page. The word "Questions?" is written in a bold, typewriter-style font across the middle of the page. The spiral binding is visible at the top of the notebook. The lighting is soft, creating a slight shadow on the right side of the page.

Questions?



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# Hypotheses

H1: “I dance according to the tune” (*“Al son que me toquen bailo”*)

RGs interact with STI policies and have learned to take advantage of them, articulating and combining different types of policy instruments, according to their needs and interests.

H2: “Performing a juggling act” (*“Haciendo malabarismos”*)

RGs maintain research lines defined autonomously, which do not depend on STI policy instruments.

H3: “I’m still the king... of juggling” (*“Pero sigo siendo el rey... de los malabares”*)

Leaders of the RGs play a specific role in taking advantage of STI policies and articulating them.

H4: “Mother there is only one” (*“Madre no hay sino una”*)

Institutions to which RGs belong play an important role in the local reconstruction of STI policies and instruments, filling gaps in policies and instruments at higher levels (regional or national).