South-South Collaboration in Health Biotechnology

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Why Study South-South collaboration?

- While South-South collaboration has been on the development agenda since mid 1950s, there is an increasing emphasis on South-South collaboration in recent years: Both bilateral initiatives and multilateral initiatives such as the IBSA (India, Brazil, S-Africa) network.

- South-South collaboration is firmly on the foreign policy and trade agendas and increasingly involves science and technology initiatives.

- Health research/innovation and biotechnology are common foci of the South-South science and technology agendas but knowledge is lacking if the South-South collaboration is rhetoric or reality.
The collaboration team:

- **Brazil** - *Maria Carlota de Souza Paula* and *Tirso Sáenz* (Center for Sustainable Development, University of Brasilia)
- **China** - *Wen Ke* (Institute of Policy and Management, Chinese Academy of Sciences)
- **Egypt** - *Magdy Madkour* (Library of Alexandria)
- **India** - *Sachin Chaturvedi* (Research and Information System for the Developing Countries)
- **South Africa** - *Victor Konde* (University of Zambia)
Main Research Objectives

1. **Map** the levels, geographic distributions and key characteristics of South-South health biotechnology collaboration

2. Identify the **opportunities**, **drivers**, **challenges**, and **impacts** of the collaborations and examine the factors and conditions that shape the collaborations
Methodology

Mapping exercises
• Provided an overview of collaborative linkages
• Used co-publication (Scopus database) as a proxy for collaboration and a survey administered to biotech firms in Brazil, China, Cuba, Egypt, India and S-Africa

Case studies of bilateral collaboration projects
• Interviewed different health biotech collaborators, and other relevant experts in the innovation systems of the participating countries
What countries did we focus on?

Case Study Countries

318 interviewees in 13 countries
Mapping results: 
**South-South vs South-North research collaboration**
Mapping Results: 
*Increasing South-South research collaboration*

Source: Scopus
Mapping results:
Geography of South-South research collaboration

South-South Research Collaboration in Health Biotechnology, 1996-2009

Source: Scopus
Mapping results: 

*Disease focus of South-South Collaboration*

South-South Collaboration in HIV/AIDS research 1996-2009

Source: Scopus
Mapping result:

*Disease focus of South-South research collaboration*

South-South Collaboration in Malaria research 1996-2009

Source: Scopus
Mapping results: Main messages

South-south *research collaboration* in health biotechnology:

- Is under-harnessed, but change is on the horizon
- Demonstrated a relatively strong role for Brazil
- Shows different patterns of collaboration according to disease focus. African countries and Thailand are for example relatively active in HIV/AIDS research collaboration
- Is advanced by global forces promoting genomics
- Has increased international visibility of developing countries’ research
Mapping results: **Entrepreneurial Collaboration**

The extent of international collaboration of health biotechnology firms in developing countries

![Pie chart showing distribution of international collaboration types: 41% South-South only, 21% both, 32% North-South only, and 6% neither.]
Mapping results:

Geography of entrepreneurial collaboration

South-South Entrepreneurial Linkages
Mapping results:
Activities in Entrepreneurial Collaboration

Activities involved in the South-South entrepreneurial collaborations for all the countries we surveyed
Mapping results: Main messages

South-south *entrepreneurial collaboration* in health biotechnology:

• Is common with one in every four firms reporting South-South collaboration

• Involve mostly linkages between the leading developing countries in health biotech.

• Is strongly focused on commercial activities and contributes only marginally to new-to-the-world innovation
Case study results:

*Drivers for the collaboration*

1. **Shared health problems necessitate South-South collaboration.** For example:
   a) Chagas disease diagnostic in Brazil-Argentina collaboration
   b) Cholera vaccine in India-Bangladesh collaboration
   c) Malaria in sub-Saharan Africa collaboration

   “A collaboration between South-South… could be much more successful and realistic to solve the problem of food and hunger and health and environment”

   *(Thai policy maker)*
Case study results: Drivers for the collaboration (continued)

2. Developing countries collaborate in order to access each others’ expertise/technologies
   
a) Capacity building/technology transfer efforts particularly in scientifically weaker countries

“When Egypt faced a problem with imported insulin from the developed countries, there was only the door of China open to overcome the insulin deficiency crisis” (Egyptian entrepreneur)

Lifelabs (South Africa)

- Joint Venture with Tulip Diagnostics - INDIA
  - Transferring: rapid malaria diagnostic kits, pregnancy diagnostic kits and urine dip stick technology
b) Complementary expertise/inputs drive collaborations

- e.g., China-India collaboration on mitochondrial DNA where India gains access to China’s sequencing infrastructure and expertise and China gains access to Indian samples.

- Sometimes there are pockets of expertise in smaller developing countries important for collaboration, e.g., expertise on Beta-Thalasseemia Research in Thailand was important for China
Case study results: 
Drivers for the collaboration (continued)

3. Access to markets, clinical samples/biodiversity is an important driver for south-south collaboration.

a) Access to markets
   - Features centrally in China’s and India’s collaboration both with each other and also with far away countries such as Brazil

b) Samples/biodiversity are in high demand
   - Indian malaria researchers needed access to parasite and human population samples from Amazonia that are resistant to malaria
   - Chinese researchers needed samples of the parasite Angiosrongulus cantonensis from Thailand when dealing with increasing incidence of meningitis
Case study results:  

**Challenges for the collaborations**

1. **Lack of funding**
   Few dedicated funds for south-south research collaboration.

2. **Immature and differences between regulatory systems**

3. **Long times and costs to move samples/products across international borders**

4. **Misalignment of new South-South collaboration initiatives with existing collaborations**

*Systemic misalignments hamper South-South collaboration*
Case study results: 
*Impacts of the Collaboration*

1. Affordable health products in developing countries’ markets

   “If we collaborate with southern partners it makes a lot of sense for us, I mean without Shantha vaccines if we had to buy, the hepatitis vaccine from GSK for example, you can imagine what people will pay” (Nigerian Interviewee)

**Innovative biotech (Nigeria)**

- Collaboration with an Indian biotech firm
  - Brought affordable Hepatitis C vaccine to Nigeria making it more accessible and affordable
Case study results:

Impacts of the collaboration (continued)

Reduced costs of health products produced by complementarities

- Brazil and Cuba cooperate to solve a health problem of a third party i.e. of meningitis belt in Africa
- Finlay Institute in Cuba contributes the main vaccine technology
- Biomanguinhos of Brazil contributes effective scale up and manufacturing technology
- The price of the vaccine produced through this partnership is much lower than that on the international market
- WHO initiated the collaboration and to support the collaboration, the regulatory agencies in both Brazil (ANVISA) and Cuba (CECMED) started to work together
Case study results:  
**Impacts of the Collaboration**

2. **Increased capacity to meet local health needs**
   
   “if malaria was a problem of the west, there would have been a vaccine on the market now, but it’s not their problem, so we are the ones that have to engineer that research and find a solution.”  
   (Kenyan Interviewee)

3. **Ability to leverage on traditional medicine**
   
   There is considerable demand, e.g. in Africa for expertise from China and India in harnessing traditional knowledge/biodiversity. The demand is not only for technical expertise but also for expertise in managing the resources and the development process
Opportunities arising from South-South collaboration

1. Can extend capacity in health biotechnology between developing countries
2. Allows for a more appropriate level of technology than collaboration with Northern countries
3. Learning in harnessing biodiversity and traditional knowledge
4. Strengthen the ability to focus on local health problems and produce more affordable health products
Main findings:

• Great potential for south-south collaboration in health biotech, particularly to address shared health problems and reduce costs of health products.

• This is an underutilised resource and to harness it there is a need for greater investment in South-South collaboration by governments in developing countries, private sector, international organisations etc.

• In order to have more impacts there is a need for better alignments of south-south collaboration to the wider innovation systems in the countries involved.
Key recommendations

① Increase resources for South-South collaboration
   e.g. national and bi-lateral funds for technological cooperation

② Consider trilateral collaboration

③ Prioritise areas of collaboration
   e.g. dedicated institutional mechanisms like bilateral councils to prioritise research
Key recommendations (continued)

4 Include support for entrepreneurial collaboration
   e.g. through support for joint R&D or purchasing arrangements

5 Integrate South-South collaboration
   - Integrate science, technology, innovation and health promotion plans.
   - Integrate training and research and include e.g. seed grants
   - Integrate research and innovation activities

Look at South-South collaboration as interactions of innovation systems and focus on policy alignments.
Thank you!

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