



Collaborative Innovation:

What is “collaborative innovation” and how can it be used to catalyze the development of new technologies to create social impact?

November 2021

AGENDA

- 1.- The importance of collaboration for innovation
- 2.- Developing countries' innovation strategy
- 3.- Chile's innovation ecosystem



The Importance of Collaboration

- Innovation needs collaborative networks, because it is a complex process
- Countries more collaborative have more economic complexity, that reflects the amount of knowledge that is embedded in the productive structure of an economy
- When a country tries to become more complex, **it shifts focus from low-value products and low-skilled knowledge to those requiring higher skills.** Rising the income gap and inequality

Hidalgo and Hausmann

Collaboration and networks in developing countries usually is weak

QUADRUPLE HELIX COLLABORATION Innovation Processes

1 - Sector Model



Economic Complexity

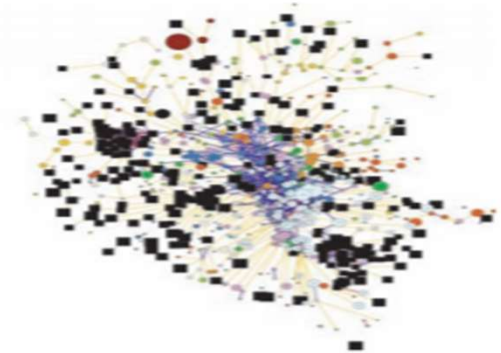
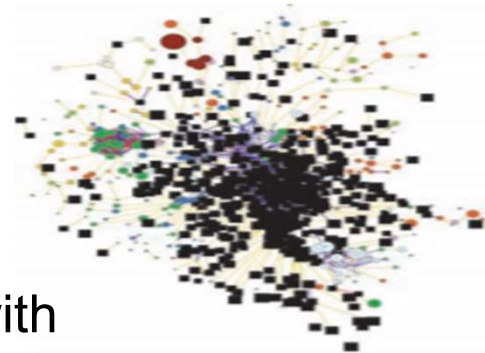
We see industrialized countries with industries well connected but is not the case in developing countries.



Industrialized Countries



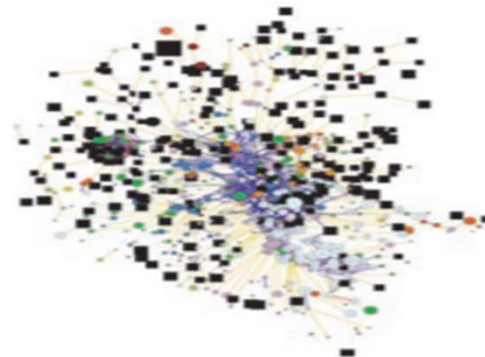
East Asia Pacific



Latin America and the Caribbean



Sub-Saharan Africa



Success stories: TT as strategy. Newly industrialised countries:



Policies are needed to integrate stakeholders in developing countries

Innovation strategy: Aligning several aspects to generate impact at the local level

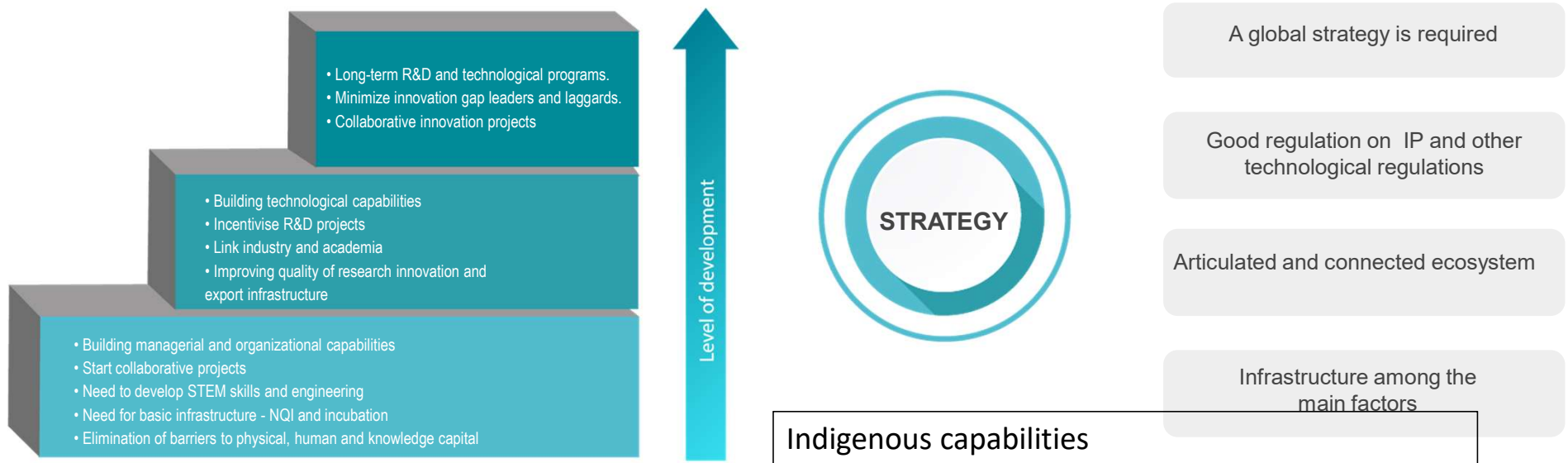


Source: World Bank 2017.

Note: NQI = national quality infrastructure; R&D = research and development.

Developing countries strategy

Developing countries need developed countries to innovate, because they have most of the technology. That explains as well the successful innovation strategy developed by Korea and Singapore that hire foreign technology through turnkey contracts



World Bank 2017, The innovation paradox

What did Chile do to foster innovation?

Defined strategic sectors:



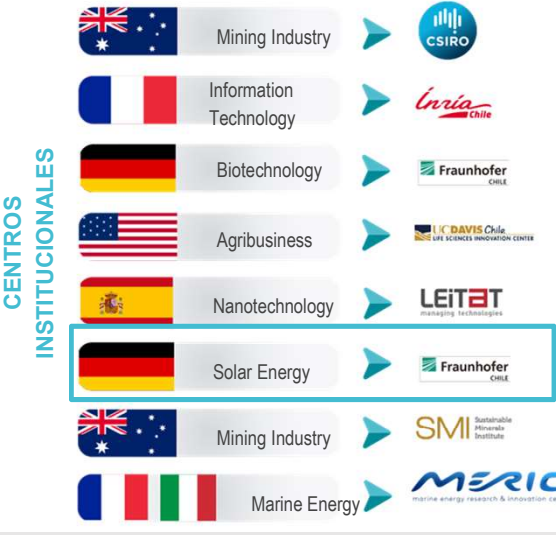
Two main aspects to define sectors or areas:

- Competitiveness and market
- Indigenous capabilities

The Chilean Innovation Ecosystem: Two collaborative programs

International center that works with local research entities

Center of excellence attraction



CENTROS CORPORATIVOS



Conformed by specialized international entities

Technological Consortiums

Articulating through technological consortium

**Conformed by
universities and
companies (national and
international)**



Cellular therapy



Respiratory and other diseases



Plant breeding program



Plant breeding program



Aquaculture technology on food and fish health



Wine consortium .

Different collaborative program's approach:

- **Center of excellence**

International center that works with local research entities: research contracts

- 1) Capabilities not integrated in the center
- 2) Focus on technological area
- 3) Governance requirement: NO
- 4) IP policy: Yes

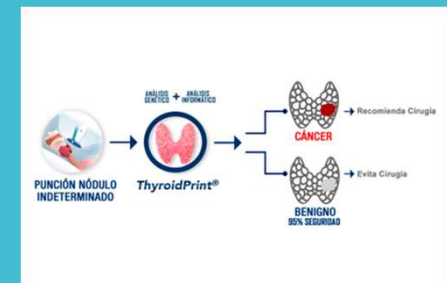
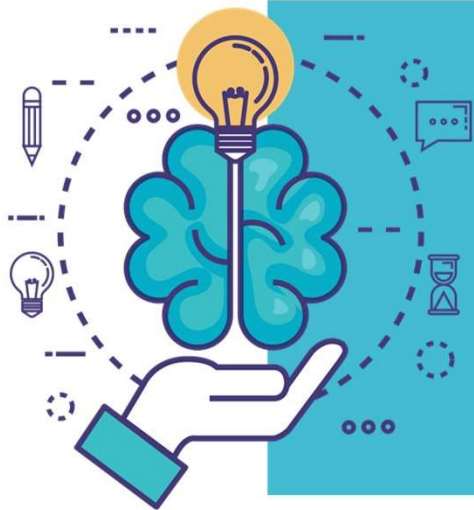
- **Technological Consortium**

Different entities national and international that are organized to innovate in the country

- 1) National and foreign capabilities are integrated
- 2) Specific projects in a defined technological areas
- 3) Governance requirement: Yes
- 4) IP policy: Yes

...But not every Collaborative Program Works:

Just one program has positive outcomes:



Elements for success: Technological Consortium

Rules for collaboration

1. To have indigenous capabilities and international capabilities (companies+ universities or research centers) integrated in a new association
2. Local direction and management
3. Program with specific research lines and expected results but flexible
4. Strong governance in different levels
5. IP policies and contracts. Local component

Elements for success: indigenous capabilities

The local and international capabilities must be integrated and the Consortium management must have a national focus

Elements for success: research lines

Program with specific research lines and expected results:

- Flexible
- Not open in a specific area
- Needs a close follow up by development agencies

Elements for success: Governance with a local view

Rules for collaboration

Good governance at different levels:

Board:

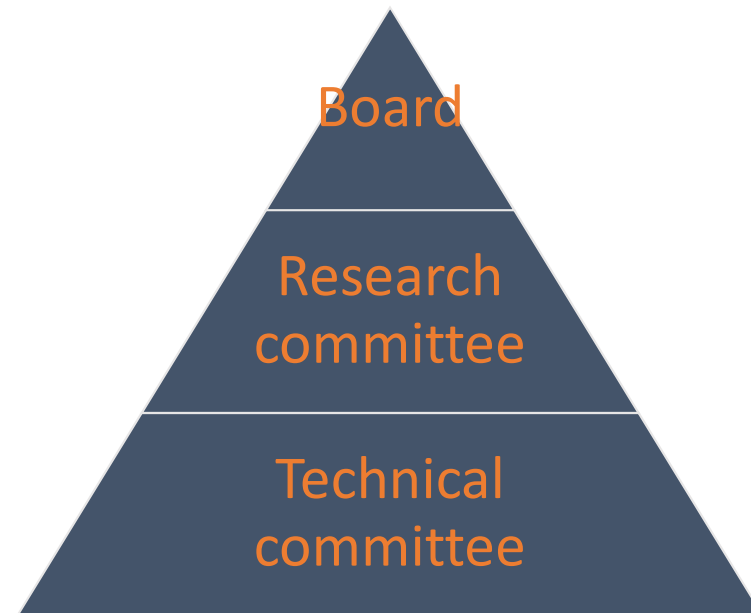
Long term view- scientific

Short term view: companies (majority)

Local management

Number not large: 5 or 7

Research committee is strategic and connect board with the technical committee



Elements for success: IP policies

Rules for collaboration

Contracts and IP policies focus on technology transfer, for example:

- If consortium members have previous IP, must be agreed on the possibility to create and exploit a new one an future IP based on the previous one
- To have clear rules for IP ownership and IP commercialization
- And have a business model based on intangible in order to give them economic sustainability

A local development or technology transfer at the local level must be required

What was the social impact of the technological consortium model?

One of the Consortium was focus on human health: respiratory disease vaccines and created new local capabilities in the area



- Enfermedades Autoinmunes
- Salud Pública

USD 6,0M
\$4.055 millones

- 24% Recalcine \$983 mill.
- 54% Subsidio CONICYT
- 22% PUC valorizado

USD 1,8M
\$1.201 millones

- 24% Recalcine \$290 mill.
- 75% Subsidio CORFO
- 1% BMRC valorizado

- Vacuna

USD 11,5M
\$7.826 millones

- 20% Abbott \$1.576 mill.
- 8% Abbott valorizado
- 50% Subsidio CORFO
- 18% PUC valorizado
- 5% BMRC valorizado
- 63% ejecución

13 patentes en el mundo

Patentes concedidas:

EE.UU, Sudáfrica, China, México, Corea, Macao, Japón, Chile

Formación de RRHH + Equipamiento e infraestructura

169 técnico - profesionales en el período 2008 a 2017

19 Doctores y atracción de 95 estudiantes (66 pre-grado, 19 de doctorado, 6 postdoc)

Publicaciones ISI

95 Artículos ISI publicados en el período 2008 a 2017

Modelo de transferencia y comunicacional definidos

Equipo de administración consolidado

12 Proyectos

17 Complementos

6 Proyectos

GTM > L2



GTM > L2 > V+E



ITE1



L2



3 r.i. + 2 p

GTM > L4



AT > IT2

- Plataforma I+D aplicada
- Ingresos por licencias
- Know-How basal
- Derivación de nuevos productos y servicios

- Vacuna trivalente
- Otros formatos diagnósticos
- Semillero de proyectos

Ciencia Básica

I+D Aplicada

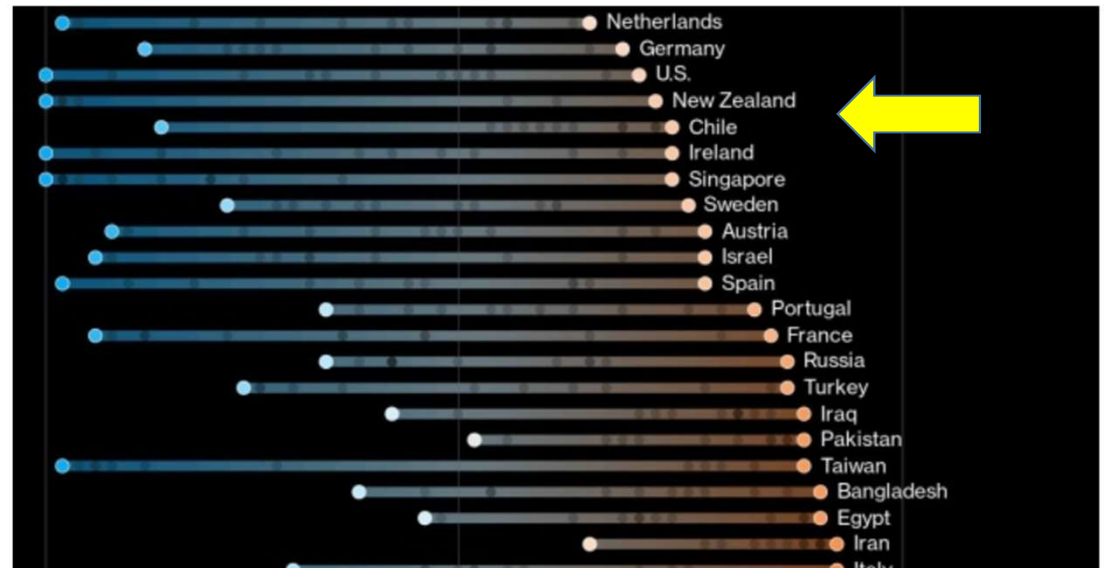
Transferencia + Sustentabilidad

COVID-19 Response

Due to Chile's experience on respiratory disease vaccines development, was invited to participate in Sinovac Covid Vaccine clinical trials and negotiate enough vaccines for Chile population.

The Winners And Losers From a Year of Ranking Covid Resilience

Bloomberg News, Bloomberg News



COVID-19 Response

Additionally a new Sinovac manufacturing subsidiary and R& D center will be installed in Chile soon .

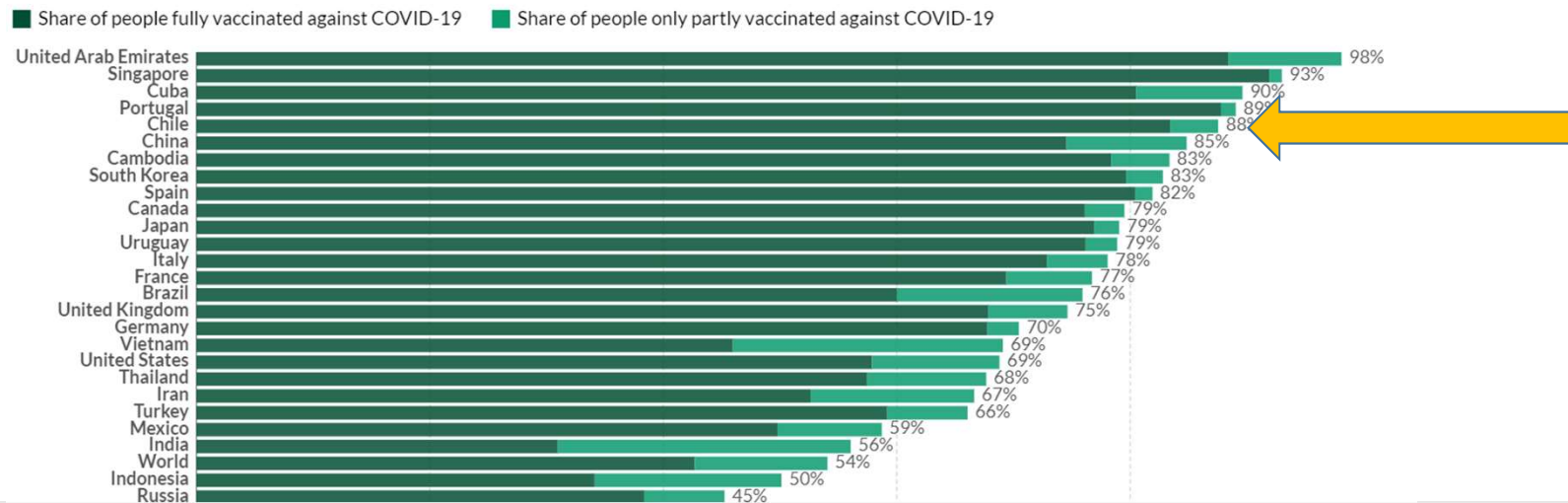


Conclusion: Social Impact

Technological Consortium not only produced technical capabilities but also collaboration capabilities and these capabilities enable us to face pandemic having a huge social impact

Share of people vaccinated against COVID-19, Nov 27, 2021

Alternative definitions of a full vaccination, e.g. having been infected with SARS-CoV-2 and having 1 dose of a 2-dose protocol, are ignored to maximize comparability between countries.



Thank you!
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