When the South comes to the North

Brazil's and Argentina's international collaboration in agricultural and environmental research in France

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1 Context

Presently, the global landscape of agricultural research is moving away from relatively concentrated research systems in some industrialized countries toward a worldwide distributed network of individuals and teams, recognized for their research relevance and quality. This shift is changing the paradigm of international research collaboration that has been largely funded and led by the North to a model where the South is proactively shaping research agendas.

Montpellier is among the main locations in Europe oriented toward the Mediterranean and tropical agricultural research. In the early 1990s, the US Department of Agriculture's Agricultural Research Services and Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) setup laboratories in Montpellier. In 2011, the CGIAR Consortium established its headquarters there thus increasing international collaboration and a focus on tropical research [1]. More recently, the Brazilian agricultural research organization (Embrapa) and the Argentinean agricultural research institute (INTA) have established permanent offices at the Agropolis International building in Montpellier in 2002 and 2012, respectively. Active collaborations

1. The Consultative Group on International Agricultural Research (CGIAR) is a consortium composed of 15 Research Centers dedicated to scientific research and, as it states on its Website "is a global research partnership for a food-secure future. CGIAR science is dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources and ecosystem services". Since 2017 it has been renamed CGIAR System Organization.

are taking place among senior researchers of these Brazilian and Argentinean organizations and their French or European colleagues on advanced research topics.

Argentina and Brazil have developed strong agricultural sectors, and agricultural research collaboration is considered an important lever to support related policy objectives including export development. Their commitment to global research networks is also very important, as witnessed by their recent engagement on global issues such as climate change, biodiversity erosion, land degradation, renewable resource scarcity, and contribution to global public goods (e.g., land management and planning, and greenhouse gas emissions, animal/human health).

2 Empirical Approach and Main Findings

The French domestic research system in agriculture is mainly constituted by public organizations such as the National Institute for Agricultural Research (INRA) and National Research Institute of Science and Technology for Environment and Agriculture (IRSTEA), and a powerful General Direction for Education and Research at the Ministry of Agriculture which is in charge of a hundred agricultural secondary schools, five veterinary higher education schools, some ten agricultural engineering schools that include three prestigious "higher" engineering schools.

In the early 20th century, agricultural research in France was institutionalized mainly through the creation of INRA's predecessors but also on tropical and sub-tropical areas with a Council on overseas research and two research organizations : the Agricultural Research Centre for International Development (CIRAD) and the Office of Scientific and Technical Research Overseas (ORSTOM), later to become the National Research Institute for Sustainable Development (IRD).

Agricultural sciences have over time moved from a discipline (agronomy) toward a more complex field that attends to both the basic needs at "ground level" (the soil) and the policy mission of food security. The particularities of tropical agriculture, with different forms of organization (access to land and markets, working conditions and organization, etc.) and biophysical conditions, required a different conceptual framing of research. The concept of *Agricultural Knowledge and Innovation System* (AKIS) came to be utilized by French researchers. It framed tropical research in a holistic manner, encompassing various dimensions of research, training, and an appreciation of the organization of the agricultural profession, public policies, and the private sector's role in agricultural production.

Collaboration between French researchers and peers in low and middle-income countries has been supported through numerous programs. For example, INRA's AGRITERRIS laboratory in Argentina, CIRAD's Platforms in Partnership for Research and Training and IRD's Collaborative International labs (LMI) all enable French researchers to collaborate with their peers in developing and emerging countries. In addition, the French government has provided long-standing support to its public research institutes to conduct tropical and Mediterranean agricultural research. By contrast, other large industrialized countries have diminished their support to domestic research institutions dedicated to tropical (former colonial) agricultural research

(e.g., NRI and ODI in the UK, and KIT in the Netherlands). As a result, France has a relatively strong position inside the international agricultural research system.

When Embrapa and INTA established offices in Montpellier, their motivation differed from those of the USDA-ARS and CSIRO. These latter agencies wanted a base in Europe to study pests introduced to their continents from Europe and undertake pest management research. By contrast, Embrapa and INTA sought to deepen contacts with industrialized countries and develop new relations in Sub-Saharan Africa (mainly Francophone and Lusophone countries). Agricultural research collaboration at Montpellier doubled as an instrument for diplomacy and trade promotion, in terms similar to those advanced by European countries in the 50s and 60s.

Established in 1956, INTA was mandated to lead Argentina's agricultural modernization. In the early twentieth century, Argentina was the "breadbasket of the world", but by the 1950s production levels had declined. The strategy of industrialization by import substitution of the 1940s and 1950s did little to develop the agricultural sector. Argentina did not keep pace with new mechanization practices, and genetic and agronomic developments that were being adopted worldwide with the onset of the Green Revolution. In the 1960s and 1970s, the 'desarrollista' model promoted by the UN's Economic Commission for Latin America and the Caribbean emboldened INTA to support middle-sized, mainly family-based farms. Prioritizing modern agriculture as a pillar of national economic development, INTA played an important role in modernizing agriculture. With the advent of the military dictatorship in 1976, INTA lost its financial autonomy and its budget was slashed. The new policy orientation favoured the private appropriation of INTA's scientific work which benefited the most concentrated parts of the agricultural sector. Moreover, the social role of INTA was severely undermined by the dictatorship's technocratic vision.

Today, INTA has a large network of 50 experimental stations, 21 institutes and 354 development and extension agencies spread throughout the country. From the outset, INTA has pursued an external training strategy for researchers, formed alliances with national universities for post-graduate training, and interacted with farmers and rural communities through extension services. Since 2003, INTA has benefited from the renewed government attention to science and technology, a growing budget, the recruitment of researchers and development agents, as well as the return of scientists exiled abroad. INTA's Institutional Strategic Plan (IEP 2005-2015) funds new regional programs and centres (e.g., Ecoregions and Support for Territorial Development program, the Research Center for Family Agriculture) in addition to product specific research, and the strengthening the extension and development sector. INTA has maintained its support for technological and territorial development through the agro-business sector, which has had strong industry links (e.g., seeds, agrochemicals and machinery) since the 1990s. That form of collaboration promoted, for example, extensive mono-cultivation of transgenic soybean and heavy use of glyphosate. INTA has monitored the negative environmental and social externalities of this model and is particularly keen to reorient this production model.

Brazil created Embrapa in 1973. This public research institution has developed a network of 47 research centres throughout the country and employs close to 10,000

people. Embrapa has contributed significantly to agricultural productivity, which over a 40 year period has increased by 172%, and land cultivation has expanded by about 30%. As a result of Embrapa's influence, Brazil is considered a world leader in the production of biofuels, plant fibres and food production for both humans and animals. In response to the increasing global demand for agricultural products and related sustainability challenges (e.g., climate change, soil acidity, emerging crop diseases), Embrapa's research agenda focuses on sustainable intensification practices and biotechnologies to increase productivity and provide environmental services. Agriculture is framed as a key component, not a problem, of a more sustainable future.

Both Argentina and Brazil have created laboratories abroad to support their national research efforts and to contribute their expertise to address common challenges. Starting in the late 1990s, Embrapa developed a new partnership platform or "laboratory without walls" called Labex. The first Labex was created in 1998 in the United States in collaboration with USDA-ARS, and four years later Embrapa's second experiment, Labex Europe, was inaugurated at Agropolis International. Since then, Embrapa replicated the Labex model to formalize research collaboration in Asia with new centres in South Korea and China, established in 2009 and 2012, respectively.

Labex Europe is a tool for promoting collaboration and developing innovative technologies for tropical agriculture. Senior researchers from Brazil are based at Labex centers for 2 to 4 years during which time they lead joint research projects. They must also devote one-third of their time to scoping and dissemination activities (site visits, participation in conferences, etc.) and manage the lab. Seeking to build on the success of the Labex model, Embrapa is now experimenting a new "Reverse Labex", whereby foreign senior researchers are invited to work at Embrapa research centres in Brazil.

The Brazilian model had a demonstration effect on INTA, who created an equivalent program in 2012 called Labintex. Also based at Agropolis International, Labintex facilitates INTA staff participation in European scientific research networks. Labintex organizes its research activities in four thematic areas, each carried out by an INTA researcher who spends four years in Montpellier. Labintex is now a showcase for INTA and Argentina in Europe in agricultural science and technology.

Labex and Labintex are useful to European researchers who have an opportunity to develop new collaborations and understand emerging challenges facing tropical agriculture. The presence of experienced Brazilian and Argentinean researchers, and access to their networks is a direct and quality source of information for European colleagues. An example of the benefits of collaboration to emerge from the presence of Labintex and Labtex in France is the emergence of new paradigms, such as agroecology. https ://www.overleaf.com/4693139459fcgfqxdmmxzz

3 Main messages for policy and practice

The "wall-less" laboratories Labex and Labintex in France and their partnerships in other countries, constitute a remarkable re-organization of collaboration between French researchers and their peers in Brazil and Argentina. In this case, Embrapa and

INTA have pro-actively established collaborative research platforms in France to cross-fertilize views, identify emerging issues, and construct shared conceptual frameworks to interpret the dynamics that characterize today's agriculture and territories.

In a new multipolar world, emerging countries are rightfully setting shared agendas for scientific collaboration. Brazil's Embrapa and Argentina's INTA are pioneering examples of research agencies re-shaping international collaboration. The presence of Argentinean and Brazilian researchers in France has proved to be fertile ground for promoting common research cooperation. Their model is having a demonstration effect. University Putra Malaysia, for example, recently established a similar agro-environmental research platform in Montpellier.

Food, nutrition, the environment, and biodiversity are all notions that have different values according to different cultures, histories and geographical locations. We need a diverse scientific community if we are to address such issues on a global scale, and recognize that new ways of promoting scientific communities in the South are needed. The Labex and Labintex models merit further exploration, and potentially with our African partners to enhance collaboration on food or environmental issues that are linked to nutrition, health and the future of the planet's renewable resources.

The status of Agropolis International as a non-for-profit organization has brought together higher education and research establishments in the Languedoc-Roussillon region, allowing foreign research organizations to have balanced relations with French and European counterparts and with the international CGIAR system. We believe the proximity and close contact with research communities from the South, particularly on the other side of the Mediterranean and the Sahara, is needed to understand and address our future challenges. This would require greater inter-institutional collaboration to reproduce the Labex/Labintex model, but such investments are capable of renewing research agendas and the necessary confrontation between temperate and tropical worlds. We should move beyond the traditional building blocks of bilateral research cooperation between countries : the world of research and training needs to be constructed from a global as well as intercultural perspective.

Related Resources

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