**Brazilian Agency for Industrial Development (ABDI)**
**Observatory for Innovation and Competitiveness - IEA/USP**

# Methodology to Conceive and Execute the Plan of Brazilian Mobilization for Technological

# Benchmarking on International Strategies for Innovation

## Research contractor: CEBRAP

Executive Summary: Final Report

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# Executive Summary

- Even though there are crucial differences between the seven countries researched as benchmarks (USA, Canada, Ireland, France, United Kingdom, Finland and Japan), one commonality is the adoption of a new paradigm in which knowledge has become a key issue for socio-economic production. The goal of transforming these seven economies into dynamic based more innovation has achieved consensus among public institutions, authorities, policy makers, entrepreneurs and academics. This implies that the seven governments, together with industry associations, academics, and research centers, are developing policies, programs, and plans in which innovation is the engine for national strategies of development;
- Innovation is at the core of the competitive strategies of these seven countries. What this means is that companies – in terms of their skills and training – are the main targets of public policies. They are, surely, not the only ones, but the most appropriate and equipped for that.
- Although each of the countries from this study are located at different levels of innovation, all of them are experiencing the construction of a knowledge-based society;
- The seven countries are pursuing "world class research and innovation" and are improving their national innovation systems. Innovation, Science, Technology and Education are the main tools in all of the development strategies studied;
- Contrary to the past in which the emphasis was to support institutions dedicated to basic research, companies now have become the main target for all of these governments. The focus on encouraging companies' innovation thus aims to improve their competence to produce and generate goods and processes with higher added value, to increase technical skills and human capital, and to boost entrepreneurship and advanced management processes among entrepreneurs as a way to foster competitiveness and productivity;

- Innovation is conceived as an engine for growth, a key element for improving productivity and competitiveness. It is understood as the generation of new products, services, processes, businesses, organizations, and strategies. Therefore, the concept embraces more than just R&D, Science and Technology;
- The standards used to measure competitiveness in the seven countries are always related to global best practices. Nevertheless, designing a system for measuring, monitoring and evaluating is essential in order to help companies, industrial sectors and national economies to identify their own growth patterns and obstacles to their improvement;
- In all of these countries, there is a constant effort to create a friendlier market for innovation. This means providing special attention to infrastructure, to legal and regulatory systems, and to incentives and other tools needed to optimize business performance. At the base of these programs lies a search for generating better employment conditions (more qualified jobs and higher wages) in order to produce positive impacts on income and quality of life;
- In all the seven countries, the State - through its institutions, policy instruments, and planners - performs a fundamental role in the elaboration, implementation and sustainability of innovation policies. The State works by enabling, articulating, and structuring cooperation with the private sector, even in countries associated with a heavy reliance on the free market and that have decentralized federal structures – such as the USA;
- In all of the countries visited, there is an intense debate over the role to be played by Universities, which are encouraged to adapt to changes. Among the most important issues targeted for change include increased cooperation with firms and the social-economic relevance of academic research agendas. Attracting foreign students and researchers has also become an important issue. Competitive systems for funds are becoming even more sophisticated for both academic research and companies. Overall, evaluation systems are trying to become comparable with international standards of best practices;

- The seven countries are developing policies to foster innovation that are different from those of the past. This change is evident when looking at the creation of new institutions for implementing, coordinating, monitoring, evaluating, and improving new programs and policies for innovation;
- Although at different levels of development, the seven countries are devising new forms of cooperation and debate between public and private sectors in order to mobilize entrepreneurship and build more innovative economies. In all of them, there is strong evidence of new patterns of articulation, commonly denominated as Pacts, Forums, Movements, or Alliances. These societies have reached strong consensus of a common vision about the future. Political consensus concerning the future path of the country allows public institutions, policy makers, and entrepreneurs to trust in long-term policies, even when there are changes in power. This cohesion certainly explains an expressive amount of their success;
- Brazil has also experienced institutional, legal, and political change in order to focus on innovation. Since the development of the "Fundos Setoriais", "Lei de Inovação", "Lei do Bem", the creation of the "Conselho Nacional de Desenvolvimento Industrial" (CNDI – National Council of Industrial Development), and of the "Agência Brasileira de Desenvolvimento Industrial (ABDI - Brazilian Agency for Industrial Development), Brazil has matured and modernized in terms of legal and institutional tools. Despite the institutional deficit and imperfections concerning existing laws and politics, Brazil is not incapable of planning and carrying out innovation-based development strategies. Nevertheless, the weakness of state power, the inefficiencies of public institutions, and a complex bureaucracy that obstructs concrete actions are problematic issues that make the task of coordinating initiatives for building a innovation-based economy more difficult;
- The ongoing building process of political consensus concerning future guidelines for the country and the paths to pursue economic development, which increase the difficulties of coordination between

public institutions, stand out as important obstacles towards mobilizing for innovation in Brazil. Thus, the new status of knowledge in the economy is recognized, but industrial policy is still misunderstood as a policy to reduce the *Brazil cost*.

- Brazil still occupies an initial stage of acknowledging innovation as a key issue towards diversifying its productive structure. Both public and private sectors have difficulties in establishing priorities for investments and resource allocation. There is a tendency to see exportation as a strategy to improve the competitiveness of companies, but the number of competitive and exporting companies remains small and the effort for internationalization is still incipient.
- Overall, Brazilian entrepreneurs and governments are just starting to consider innovation as a key issue for sustainable growth. In particular, entrepreneurs still consider innovation as high-tech development and restricted to large companies. The PITCE (Industrial, Technological and Foreign Trade Policy) has indeed been assumed by government and business leaders, but its implementation still needs to be speeded up and many of its characteristics are undefined and object of disagreement.

## 1. Mobilization for Innovation in Brazil

- Establish forums to improve dialogue and permanent debate with business leaders in order to develop a National Innovation Initiative;
- Establish a network of Brazilian researchers abroad to obtain information data, analyze trends, and undertake forecasting studies;
- Organize a campaign to publicize laws and institutional tools for supporting innovation;

## 2. PITCE Coordination

- Goal: to increase the cohesion and coordination in the implementation of PITCE;
- Proposal: to reinforce the command of PITCE, the articulation between Ministries and Agencies and the dialogue with the private sector to increase the efficiency of the industrial policy;

## 3. Articulation and Institutional Arrangements

### Hubs, Networks and Arrangements

- Encourage the development of hubs, networks and arrangements for innovation, that connect groups of companies, Science and Technology Institutes (ICTs), and a diversity of local institutions, with the objective of establishing an arrangement similar to the Brazilian APL (Local Productive Arrangement), focused on innovation. This proposal was inspired by the French experience of the "Pôles de Compétitivité" (Competitiveness Hubs) and by the Finish initiative for developing the Strategic Centres for Science, Technology and Innovation;
- This proposal encourages the development of productive arrangements or services of excellence. Governmental institutions aid the articulation and provision of competitive subsides for the governance of these arrangements. Determining skills in each productive arrangement should result from debate among public and private powers. Considering that the design of these arrangements is flexible, their governance might be focused on the establishment of export hubs, on project management, among others. Governance systems are not standardized nor centrally defined in Brasilia. They should enable the proper functioning of networks or excellence arrangements in a way it involves companies. The participation of local authorities (city councils, secretaries, regional entities) is essential;
- These arrangements could create a juridical entity for governance and could invest subsidized funds for the contraction of needed

improvements. This means that these productive arrangements should participate in competitive tender processes;

- These arrangements, hubs or networks for innovation can be local, regional, sector-based, or project-based, as long as they are coherent with the priorities previously established by the PITCE. Networks that are only academic or only built by companies should be considered insufficient for the process. The importance of companies should be relevant and shall not be just an excuse for the development of academic research.

**Meso Projects**

- Formulating meso projects aiming at developing strong technological projects, focused on real problems chosen as major priorities for business activities, and potentially involving a heterogenic set of companies and university competencies. For instance, a program for component materials that initially draws in companies such as Embraer and Petrobras, but with high probability to comprise autoparts companies and several others.
- This proposal is similar to some priority projects developed in Japan (ex. supercomputer), France (ex. TGV), and the USA (ex. defence programs). Those projects are formulated by the State, but have also direct participation of companies;
- Meso projects would be based on ICTs' pre-competitive research articulation as long as they are formulated with companies that would be potential users of these developments. Meso projects can be set for the development of public infra-structure, including hydrolysis processes and advanced technologies related to bioethanol;
- The main point is the strong coordination of the State through institutions that have foresight into activities and operational capacities. ABDI is the *locus* for that coordination and articulation, either because of its mission or of the tools it is building, such as RENAPI – National Network for Industrial Policy Agents;

- Managerial and technological extension. Brazil has experienced successful mobilization programs, such as PBQP – Programa Brasileiro de Qualidade e Produtividade (Brazilian Program for Quality and Productivity), responsible for widely disseminating quality management tools and helping companies to rationalize their productive processes. Programs like this are important and help to build a managerial culture, but cannot operate in isolation. The Sao Paulo State has some programs such as PRUMO, which aims to improve the technological infra-structure of small businesses, and also a program for assisting exports, Progex;
- The new national program, to be performed with local partnership, should focus on providing organization and management advice to small businesses. This proposal is inspired by the system of rural credit, which was part of the technical project performed by Emater: the credit was based on technical analysis. There are no similar projects in Brazil, neither for industry nor for the service sector. Experiences such as PEIEX, from the Ministry of Development, Industry and Foreign Commerce (MDIC), might help by establishing an advisory system for businesses with a team of local advisors (coming from local institutions such as universities) properly trained to evaluate businesses both on organizational and managerial aspects. These advisors should also have a minimum knowledge of public programs that support innovation initiatives, such as: Progex, Prumo, Finep, Fapesp, CNPq, and BNDES programs. Eventually, they might receive some support from sectorial technology centers in order to be able to suggest improvements and use of existing tools.

**Management and Evaluation**

- Build a permanent system for monitoring and evaluating competitiveness and innovation policies based on international standards of excellence;

- Establish a national meeting of observatories, agencies, and research centers that focus on innovation in order to debate the formulation of a national innovation system;
- Define and articulate with the PITCE guidelines for programs and projects in order to improve innovation management.