**PARAGUAY**

**Strengthening and Scaling-up Capabilities of National Innovation System**

**TERMS OF REFERENCE**

**PR-T1225**

**“Methodology and Institutional Assessment of CONACYT and GRIs (3)”**

**Background**

Paraguay has achieved outstanding economic growth over the last five years, with an annual growth of GDP of 5.6% (ECLAC, 2014). Underpinning this excellent performance are sound macroeconomic policies, structural reforms and excellent external conditions. However, high poverty, inequality and low investment in knowledge remain the biggest challenges that the country has to face in order to sustain its growth potential. In fact, Paraguay still lags behind most Latin American countries in terms of per capita income and investment in knowledge. Indeed, at 0.06 percent of GDP, investments in research and development (R&D) are significantly lower than region’s average (0.76 percent, RICYT, 2015). Poor access to knowledge, human capital and finance together with lack of sophistication of the production structure explain a significant part of this gap (BID, 2014). Moreover, increasing the contribution of innovation to growth becomes critical in a context of declining commodity prices.

However, the simple identification of market and coordination failures is not enough for successful policy intervention. This also requires institutional capacities in the public sector for policy design and implementation. Over the last decade Paraguay has embarked in a process of reforms in order to scale-up science, technology and innovation (STI) policies as the country has gradually set up a system of rules, institutions and other policy instruments to ensure the coordination of the country’s science, technology and innovation activities. Key ingredient of these reforms has been the establishment of a new national funding agency (National Council for Science and Technology, CONACYT) (<http://www.conacyt.gov.py/>). CONACYT is in charge of the management, coordination, financing and evaluation of national STI policies and to do this has a multi-stakeholders governance with a board composed of representatives from various ministries, industrial associations, public and private universities, trade unions and the Scientific Society. In this context, CONACYT plays a dominant national funding agency (NFA) role concentrating science, technology, human capital, business innovation and entrepreneurship support programs under a single window[[1]](#footnote-1).

Another important recent institutional reforms have been the establishment of the National Researchers Program (PRONI) - a program managed by CONACYT -that assesses the productivity of domestic researchers, categorizes them and grants performance incentives and the creation by law of the National Fund for Public Investment and Development (FONACIDE)[[2]](#footnote-2), through which CONACYT will receive between USD30 – USD50 million per year to fund R&D projects and human capital scholarships.

Nevertheless, regardless the support from the IDB, CONACYT still need to develop institutional capacities in key areas such as policy planning, project management, information systems, human capital and program evaluation. Furthermore CONACYT needs to develop these capacities in particular regarding to how to encourage STI’s technology transfer to the productive sector and how to promote business innovation[[3]](#footnote-3). At the same time poor attention has been given so far to government research institutes (GRIs) as mechanisms to build absorptive capacity for technology transfer and assimilation by the productive sector. As the previous experience of successful developed countries suggests, during the early stages of the catching-up process when domestic firms do not have enough scale nor capabilities to carry-out indigenous innovation, GRIs become critical instruments for technology adoption and transfer to the private sector.

Paraguay has 12 GRIs, some of them created in the 1970s as decentralized agencies of sectorial ministries or affiliated to national or even private universities, with poor performance in terms of technology transfer and commercialization mostly due to their poor governance, lack of financial sustainability, obsolete infrastructure and limited internal management capabilities.

**Objective**

The overall objective of the consultancy is to assess institutional performance and identify challenges and gaps for CONACYT and three GRI. The specific objectives are:

1. Develop a methodology to assess institutional capacities; and
2. Assess institutional capacities in CONACYT and GRIs (3).

The methodology should consider the particularities and functional differences between CONACYT and GRIs, while the institutional assessments should identify challenges and gaps that need to be tackled, taking into consideration the lessons learned from the Korean case-studies during the KSP, but carefully tailor made to the current institutional capacities of Paraguay.

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**Activities**

1. Develop an institutional assessment methodology. The methodology should consider:
2. the particularities and functional differences between a CONACYT and GRIs;
3. for CONACYT the methodology should assess at least: its goals, structure (staff, budget, financial mechanism, management autonomy and coordination), programs (monetary instruments, information) and learning (monitoring, evaluation and experimentation capacities).
4. for the GRIs, the methodology should look at valuing the institution at the following levels: management, research, production, transfer and articulation.
5. in both cases the evaluation process should cover a two steps cycle: (a) self-evaluation and (b) external evaluation
6. self-evaluation: the methodology should be self-contained meaning by this that they should be simple enough as to be implemented by each institution with certain regularity and based on participatory approaches; this step should conclude with a self-evaluation report
7. external evaluation: this step will provide and independent assessment of the institution carried-out by peer-institutions that are best practice of reference for Paraguay; the external reviewers will validate or correct the information in the self-assessment report identifying challenges and gaps that need to be tackled.

All consultancy products and studies will be approved by the Bank, who may consult with the Paraguayan authorities as needed.

1. Apply the assessment methodologies to CONACYT and three Government Research Institutes. The phase of assessment should consider:
2. along with the self-assessment activity carry out for CONACYT and GRI, relevant partner institutions from Korea will conduct the peer evaluation to assess institutional capacity and to provide recommendations that help improving capabilities of CONACYT and three selected Paraguay’s GRIs. During the assessment phase is expected intense communication and field work by Korean researchers from peer institutions to Paraguay.
3. the criteria for selection of the three Paraguay’s GRIs to be assessed will be based on: strategic importance for the Paraguayan economy, basic capabilities for R&D, technology transfer activities and financial support from CONACYT.
4. Based on these criteria, Paraguay’s pre-identified GRIs would be: the Paraguayan Institute for Agricultural Technology (IPTA), the Agricultural Biotechnology Institute (INBIO) and the Digital Electronics Laboratory (LED-UCA).

The institutional assessment reports will identify challenges and gaps and will provide guidelines for the preparation of master plans to strength institutions.

All consultancy products and studies will be approved by the Bank, who may consult with the Paraguayan authorities as needed.

1. Communicate and discuss results from institutional assessments in a workshop in Asunción. This activity is oriented to authorities and officers from CONACYT, GRI and IDB.

**Reports / Deliverables**

The consulting firm shall deliver the following outputs:

1. Output # 1: Methodology for institutional assessment.
2. Output # 2: Institutional assessment of two institutions.
3. Output # 3: Institutional assessment of two institutions.
4. Output # 4: Final Report - Including relevant Korean experience and main areas to be tackled with recommendations to improve performance for each institution.

**Payment Schedule**

* 30% upon delivery and approval of Output # 1
* 20% upon delivery and approval of Output # 2
* 20% upon delivery and approval of Output # 3
* 30% upon delivery and approval of Output # 4

**Qualifications**

Academic Degree / Level & Years of Professional Work Experience: TBD

Languages: Spanish, English.

Areas of Expertise: TBD

Skills: TBD

**Characteristics of the Consultancy**

Consultancy category and modality: Products and External Services Contractual,

International, Firm, Lump Sum.

Contract duration: TBD

Place of work: Korea and Paraguay.

Division Leader or Coordinator: Specialist in Science, Technology and Innovation (CTI/CPR) in coordination with CONACYT

**PARAGUAY**

**Strengthening and Scaling-up Capabilities of National Innovation System**

**TERMS OF REFERENCE**

**PR-T1225**

**“Korean and CTI work Coordination Consultancy (IFD/CTI)”**

**Background**

Established in 1959, the Inter-American Development Bank (IDB) is the main source of multilateral financing for economic, social and institutional development in Latin America and the Caribbean. It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors of its borrowing member countries

There is a growing consensus among developing countries that Science, Technology and Innovation (STI) play a central role in economic and social development, contributing to the increase on productivity and competitiveness. Hence, to most developing countries, STI capacity building can no longer be seen as a luxury. Rather, it becomes an indispensable tool for sustainable growth and poverty reduction. However, scientific and technological progress does not only require a concerted effort among all stakeholders but also a building-up on previously accumulated performances. That is also the reason why more and more countries pay attention to the importance systemic approaches such as the National Innovation System (NIS) framework to back-up this process, which means the set of actors (agencies, institutions and firms) and their stable and longer-term relationship. Within this approach, STI capacity building is challenging, never an easy task, for developing countries to come by. The experience of LAC countries is no exception. Diverse countries in the region have tried to spur economic growth through STI development. For that purpose, they continuously established research institutes, developed clusters and techno-parks and invested in human capital. But, despite their strong will and repeated programs, the result is not that satisfactory so far.

From the vantage point of STI-focused economic growth, by contrast, Korea as a late comer has achieved remarkable success since 1960s. Back then, Korea was one of the poorest countries in the world, left with devastating ruins after the colonial rule and the following civil war. In order to overcome such private sector and institutional deficiencies, Korea strategically used demand- and supply-side STI policy mixes. Particularly, Korea’s Government Research Institutes (GRIs) were highly effective in terms of making up for the technological weakness of private industries and help them adapt new technologies, attracting overseas Korean top R&D talents and nurturing STI-favorable nationwide culture as well. By doing so, Korea could form a strong and sound NIS within a very short time, jumping up to now technological leadership. In that process, the GRIs – firstly general and then specialized ones – lay the foundations for fostering strategic industries, moving from lower value-added to higher value-added ones. And around the GRIs, the university-industry collaboration, breeding local companies/financial entities supporting innovative firms and even training/learning skills could be made possible. Therefore, such Korean case can serve as a good example for catch-up countries that lack STI capabilities, especially in the early stage of industrial development.

In this regard, the Bank, which has put a special priority on helping LAC countries build STI capacity, will perform a project to support Paraguayan government to assess the current status of its NIS – centered on GRIs and National Funding Agency – and to propose policy recommendations for upgrading NIS and thereby strengthening STI capabilities, with the Korean peer partners. Along with this project, the Bank expects many demonstration projects to be followed by neighboring countries as a chain-reaction.

**Consultancy objective(s)**

The objective of the consultancy is to coordinate the cooperative work between Korea and the bank (as well as Paraguay) and to support the research and analytical work performed by the CTI Division. In particular, the consultancy will contribute in active communication among the participating institutions, writing insightful working papers regarding Korean STI policy/agencies and supporting comparative research with Paraguay and LAC. The consultancy will also assist CTI’s projects in Latin and Caribbean countries with Korea, in different tasks as needed.

**Main activities**

The selected candidate will:

* Coordinate the joint works and communication between Korea and the IDB in the fields where CTI is in charge. (Concerning Korean institutions or agencies, just name a few, include STEPI (Science and Technology Policy Institute), KIST (Korea Institute of Science and Technology), KISTEP (Korea Institute of Science and Technology Evaluation and Planning), KAIST (Korea Advanced Institute of Science and Technology) and the Innopolis (known as Korea Innovation Cluster).)
* Assist producing analytical papers on Korean STI/NIS and conducting comparative research with Paraguay and LAC.
* Assist developing policy recommendations for strengthening NIS and STI capacity building in Paraguay and LAC, benchmarking Korean best practices.
* Support holding knowledge sharing/dissemination events in Paraguay and LAC by assisting agenda setting, articulating potential areas of cooperation with Korea and providing related information or analysis on the topics requested by LAC countries.
* Participating in missions regarding STI capacity building of the IDB projects in LAC.
* Assist in developing information and databases for both the projects and papers under the responsibility of CTI.

**Qualifications**

* **Academic Degree/Level & Years of Professional Work Experience:** Required academic background includes advanced degree, at least Masters level, in STI policy, Development study, Engineering, Natural (Physical) science, Economics, Public administration, International Relations or related disciplines. Five years of professional experience in STI policy design and implementation. Proven experience of working with MDBs and in LAC is a plus.
* **Languages:** Fluency in English, Spanish and Korean is highly required.
* **Areas of Expertise:** STI policy, Engineering, Natural (Physical) science, International development, International Relations and Public policy.
* **Skills:**strong quantitative and qualitative analytical skills; experience working with business surveys and other micro data; excellent writing and communication skills.

**Characteristics of the Consultancy**

* Consultancy category and modality: Consultant, Monthly
* Contract duration: 18 Months (It will start from the first half of 2017.)
* Place(s) of work: Headquarters
* Responsible person: Gustavo Atilio Crespi, Science and Technology Principal Specialist(IFD/CTI)

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However, the simple identification of market and coordination failures is not enough for successful policy intervention. This also requires institutional capacities in the public sector for policy design and implementation. Over the last decade Paraguay has embarked in a process of reforms in order to scale-up science, technology and innovation (STI) policies as the country has gradually set up a system of rules, institutions and other policy instruments to ensure the coordination of the country’s science, technology and innovation activities. Key ingredient of these reforms has been the establishment of a new national funding agency (National Council for Science and Technology, CONACYT) (<http://www.conacyt.gov.py/>). CONACYT is in charge of the management, coordination, financing and evaluation of national STI policies and to do this has a multi-stakeholders governance with a board composed of representatives from various ministries, industrial associations, public and private universities, trade unions and the Scientific Society. In this context, CONACYT plays a dominant national funding agency (NFA) role concentrating science, technology, human capital, business innovation and entrepreneurship support programs under a single window[[4]](#footnote-4).

Another important recent institutional reforms have been the establishment of the National Researchers Program (PRONI) - a program managed by CONACYT -that assesses the productivity of domestic researchers, categorizes them and grants performance incentives and the creation by law of the National Fund for Public Investment and Development (FONACIDE)[[5]](#footnote-5), through which CONACYT will receive between USD30 – USD50 million per year to fund R&D projects and human capital scholarships.

Nevertheless, regardless the support from the IDB, CONACYT still need to develop institutional capacities in key areas such as policy planning, project management, information systems, human capital and program evaluation. Furthermore CONACYT needs to develop these capacities in particular regarding to how to encourage STI’s technology transfer to the productive sector and how to promote business innovation. At the same time poor attention has been given so far to government research institutes (GRIs) as mechanisms to build absorptive capacity for technology transfer and assimilation by the productive sector. As the previous experience of successful developed countries suggests, during the early stages of the catching-up process when domestic firms do not have enough scale nor capabilities to carry-out indigenous innovation, GRIs become critical instruments for technology adoption and transfer to the private sector.

Paraguay has 12 GRIs, some of them created in the 1970s as decentralized agencies of sectorial ministries or affiliated to national or even private universities, with poor performance in terms of technology transfer and commercialization mostly due to their poor governance, lack of financial sustainability, obsolete infrastructure and limited internal management capabilities.

**Objective**

The overall objective of the consultancy is to develop four master plans for the improvement of the institutional capacities of CONACYT and three GRIs.

**Activities**

1. Develop a framework and an annotated outline of master plan. Both (framework and outline) should include:
2. general approach to institutional strengthening;
3. strategic guidelines to create and improve capabilities. These guidelines should allow to identify relevant areas/projects for the country where CONACYT and local GRIs need to create or improve capabilities.
4. objectives, activities, responsibilities and resources. The master plan will include concrete actions needed to overcome the gaps found during the assessment phase, establish main responsibilities and identify resources (human, financial, infrastructure) to be involved.
5. output and outcome indicators.
6. Prepare master plan. Based on a participative methodology to carry out master plans, involving authorities and officers of CONACYT, GRI, IDB and Korean institutions of reference, among others. The consultant should lead the process to identify:
7. strategic focus areas for economic development and the role CONACYT and GRIs should play;
8. mid-term and long-term objectives;
9. capabilities needed and the way they are going to be developed and/or improved;
10. projects, activities, responsibilities and general work plans;
11. resources and investments needs;
12. national and international potential partners to establish long term cooperation agreements focus on developing/creating capabilities
13. Communicate and discuss master plans in a workshop in Asunción. This activity is oriented to authorities and officers from Korean institutions, CONACYT, GRIs and IDB.

All consultancy products and studies will be approved by the Bank, who may consult with the Paraguayan authorities as needed

**Reports / Deliverables**

The consulting firm shall deliver the following outputs:

1. Output # 1: Framework, annotated outline and work plan.
2. Output # 2: Master plan draft.
3. Output # 3: Master plan final document.

**Payment Schedule**

* 30% upon delivery and approval of Output # 1
* 30% upon delivery and approval of Output # 2
* 40% upon delivery and approval of Output # 3

**Qualifications**

Academic Degree / Level & Years of Professional Work Experience: TBD

Languages: Spanish, English.

Areas of Expertise: TBD

Skills: TBD

**Characteristics of the Consultancy**

Consultancy category and modality: Products and External Services Contractual,

International, Firm, Lump Sum.

Contract duration: TBD

Place of work: Korea and Paraguay.

Division Leader or Coordinator: Specialist in Science, Technology and Innovation (CTI/CPR) in coordination with CONACYT

1. In order to support these reforms, the IDB approved in 2005 the Program for the Development of Science, Technology and Innovation (PR-0126) –PROCYT- which was managed by CONACYT. This program allowed CONACYT starting its operations and to build very basic institutional capacities. This program ended in 2014. A second loan program (PR-L1070), known as PROINNOVA for a total of $10 million was approved by the Bank in November 2015. The loan contract for this second program is pending ratification by the National Congress according to the national procedures. When ratified by Congress, CONACYT will be also the executing authority of PROINNOVA. [↑](#footnote-ref-1)
2. The fund is financed through a special tax of energy exports (Law 4758). This legal framework establishes that 33% of total FONACIDE’s revenues should be allocated to the support of education and research through the Fund for Excellence in Education and Research. [↑](#footnote-ref-2)
3. For example, nowadays most of the business innovation support programs are horizontal so they support R&D independently of the sector where these R&D is being carried-out. Given the small budgets for R&D support this practice leads to the fragmentation of the fiscal resources in a large set of much dispersed activities. CONACYT needs to improve is capacities for sector prioritization and focus. [↑](#footnote-ref-3)
4. In order to support these reforms, the IDB approved in 2005 the Program for the Development of Science, Technology and Innovation (PR-0126) –PROCYT- which was managed by CONACYT. This program allowed CONACYT starting its operations and to build very basic institutional capacities. This program ended in 2014. A second loan program (PR-L1070), known as PROINNOVA for a total of $10 million was approved by the Bank in November 2015. The loan contract for this second program is pending ratification by the National Congress according to the national procedures. When ratified by Congress, CONACYT will be also the executing authority of PROINNOVA. [↑](#footnote-ref-4)
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