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EDITORIAL

Scientific and technological development in Paraguay: CONACYT's achievements and challenges

Desarrollo científico y tecnológico en Paraguay: logros y desafíos del CONACYT

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The National Council for Science and Technology (CONACYT) in Paraguay, created by Law 1028 in 1996, has been a key player in promoting scientific and technological developments in the country. This entity is responsible for coordinating two National Systems: The Science and Technology System (SNCTI) and Quality System (SNC). Its main objective is to generate policies and strategies that promote scientific and technological progress; prioritize social, ethical, and environmental sustainability; and promote scientific education and research (1). This article will examine in detail the significant achievements of CONACYT in the last nine years and the key programs it has implemented, such as the Paraguayan Program for the Development of Science and Technology (PROCIENCIA) and Paraguayan Business Innovation Program (PROINNOVA).

Development and achievements of CONACYT

Over the years, CONACYT has worked tirelessly to strengthen its internal capacities and improve its knowledge management and documentation. Through tools such as the Instrument Application System (SPI), researchers' Curriculum Vitae (CVPy), Registry of Science and Technology Organizations (ROCTI), and National Registry of Researchers (RNI), the entity has achieved greater efficiency in its processes. These fully functional capabilities have ensured the national scope of initiatives, transparency in calls for proposals, and compliance with international best practices, thus contributing to an enabling environment for research and innovation in Paraguay.

In addition, CONACYT has led the implementation of the National Science, Technology, and Innovation (STI) Agenda (2), a strategic plan that addresses national systemic challenges and global trends. This agenda has been formulated through a participatory process with the contribution of important national references. This ensures that the agenda is focused on solving the country's key problems and establishing a coherent roadmap for scientific and technological development in Paraguay.

Progress, results, and challenges of PROCIENCIA

One of the most outstanding programs promoted by CONACYT is the Paraguayan Program for the Development of Science and Technology (PROCIENCIA). Since its inception in 2014, PROCIENCIA has made significant progress in strengthening national capacities for scientific research and technological development. By funding projects and grants for the training of researchers, PROCIENCIA has boosted innovation and generated scientific jobs, thus fostering competitiveness and economic growth and contributing to effective problem solving through science-based public policies.

In quantitative terms, PROCIENCIA exceeded expectations, reaching 113% of the goals established at the end of its first phase, with a financial execution of 97%. As a result, 656 R&D projects were conducted, with the participation of more than 3,200 researchers. In addition, 23 research laboratories have been strengthened and equipped, which has contributed to the development of a cutting-edge scientific infrastructure in the country (3).

It is relevant to mention that since the implementation of PROCIENCIA, a remarkable increase in the country's scientific production has been observed. From 2014 to 2022, the number of publications indexed in Scopus and Web of Science (WOS) has tripled, demonstrating the positive impact of the program on national research. This increase in scientific production not only positions Paraguay in the international arena but also contributes to global knowledge and promotes the exchange of ideas and international collaborations (3).

An important milestone achieved by PROCIENCIA was the enactment of Law No. 7.064, which established the National System of Researchers (SISNI) and a scientific researcher's career. This regulation creates legal and institutional conditions for the development of researchers, thereby strengthening the contribution of science to national development. More than 750 researchers have been categorized through the National Incentive Program for Researchers (PRONII), which encourages and recognizes their work in the advancement of scientific knowledge in the country.

Despite these achievements, Paraguay faces significant challenges in its path towards sustainable scientific and technological development. By 2030, the country has set ambitious goals for its STI Policy. Some key challenges include the following (4):

- Increased investment in R&D: Paraguay currently allocates a small portion of its Gross Domestic Product (GDP) to scientific research and development. To reach its R&D investment target of 0.50% of GDP, a concerted effort by the government, private sector, and society in general is required.
- Development of scientific and technological capabilities: Strengthening the training of highly qualified human resources and improving scientific and technological infrastructure are essential to boost research and innovation in the country.
- Increasing the number of researchers per 1,000 inhabitants: To improve the country's research capacity, it is necessary to achieve a ratio of 1.5, full-time equivalent researchers per 1,000 inhabitants of the Economically Active Population (EAP). This requires measures that encourage and promote research at all academic and professional stages.
- Increase by five times the number of scientific publications per 100,000 inhabitants: Encouraging scientific production is essential to make the work of Paraguayan researchers visible at the international level and to contribute to the development of global knowledge.
- Duplicate the values of social appropriation of science and technology: Science and technology must be accessible and understandable to society in general. This implies generating awareness and promoting citizen participation in science so that the population recognizes its value and contribution to social welfare.
- Repatriation and reintegration of highly qualified Paraguayans: Attracting back highly qualified researchers and professionals residing abroad will enhance research and innovation in the country, benefiting from the experience and knowledge acquired outside its borders.

Achieving these objectives will require close collaboration among CONACYT, the government, universities, the private sector, and civil society. The allocation of adequate financial resources and the establishment of effective policies and programs are crucial for the success of Paraguay's scientific and technological advancement.

Progress, results and challenges of PROINNOVA

The PROINNOVA programme, with the objective of improving the productivity of the Paraguayan economy through the promotion of applied research and innovation, has made significant progress. With 70% of its commitments fulfilled, PROINNOVA has supported more than 80 contracts, strengthened companies, promoted the creation of technology-based companies, supported entrepreneurs, and strengthened incubators and technological development centers. Collaboration between the Inter-American Development Bank (IDB) and the Ministry of Finance has been fundamental to the program's success (5).

However, PROINNOVA presents several significant challenges. The low levels of productivity and innovation in the Paraguayan economy must be addressed comprehensively. Entrepreneurship and innovation ecosystems must be strengthened, and information asymmetries between companies and financiers must be resolved. Public intervention through programs to foster business innovation is essential for overcoming these barriers.

Conclusions

The achievements of CONACYT and its PROCIENCIA and PROINNOVA programs are relevant and reflect Paraguay's commitment to scientific and technological development. Through capacity building, support for research and innovation, and the promotion of the social appropriation of knowledge, the country has made significant progress towards a knowledge-based society.

However, challenges persist and require coordinated and decisive action by all the actors involved. Increasing investment in R&D, improving scientific and technological capabilities, and fostering the social appropriation of science are objectives that must be pursued with tenacity and a long-term vision.

Paraguay has the potential to become a regional benchmark for science, technology, and innovation. To achieve this, it is essential that CONACYT and the country as a whole continue working to overcome challenges and take advantage of opportunities to pursue sustainable and prosperous development at the heart of Latin America. With a clear focus and determined will, Paraguay will be in a privileged position to face the challenges of the future and contribute to the advancement of global knowledge.

REFERENCES

1. Política Nacional de Ciencia, Tecnología e Innovación 2018. Consejo Nacional de Ciencia y Tecnología. 2018. URL.
2. Agenda Nacional de Ciencia, Tecnología e Innovación 2022-2030. Consejo Nacional de Ciencia y Tecnología. 2022. URL.
3. Informe de Monitoreo PROCIENCIA. Consejo Nacional de Ciencia y Tecnología. 2022. URL.
4. Documento Conceptual del Programa Paraguayo para el Desarrollo de la Ciencia y la Tecnología PROCIENCIA II. Consejo Nacional de Ciencia y Tecnología. 2021. URL.
5. República del Paraguay. Ley N.° 5880 Que aprueba el contrato de préstamo N° 3602/OC-PR, por un monto de hasta us$ 10.000.000 (dólares de los Estados Unidos de América diez millones), suscripto con el Banco Interamericano de Desarrollo (BID), para el financiamiento del proyecto “innovación en empresas paraguayas”, que estará a cargo del Consejo Nacional de Ciencia y Tecnología (CONACYT), dependiente de la Presidencia de la República; y amplía el presupuesto general de la Nación, aprobado por la ley N° 5554 del 5 de enero de 2016, vigente para el ejercicio fiscal 2017. 2021. URL.