Establishing Colombia Technopark and Support of Nurturing Professional for Strengthening Digital Capability Project Proposal

Project title	**Establishing Colombia Technopark and Support of Nurturing Professional for Strengthening Digital Capability Project Proposal**
Organization/Department	The Inter-American Development Bank (IDB), through The Competitiveness, Technology, and Innovation Division (IFD/CTI) will be responsible for the technical supervision and administration of this Project. The National Planning Department of Colombia (DNP) will act as beneficiary government technical counterpart and will coordinate the execution of the Project under the technical supervision of the IDB.
Country/Region	Colombia (Santander Department)
Project objective	To foster the digital industrial ecosystem in Santander by the strengthening of IT capabilities of Guatiguará Techno-Park. The project will: (i) Provide and install high-tech IT equipment and utilities to guarantee the access of Colombian firms to cutting-edge technology; (ii) Nurture IT specialists and support SMEs, startups, and entrepreneurs in the IT sector for supporting the IT sector development; and (iii) Strengthen international cooperation in the IT field between the Republic of Korea and Colombia.
Project activities	The scope and requirements of the Project is to achieve the above-mentioned objectives and shall comprise the items as follows: **Activity 1. Establishment of IT Masterplan and Operational Manuals of Technopark.** This includes (i) the transferring of the "Operation model of Korean Technopark"; (ii) the preparation of operational plans including laws/systems, regulations, and organizations regarding policy on IT industry development; (iii) the establishment of annual operation manuals and self-reliance plan; (iv) the articulation strategy with government entities and international Techno-Parks; and (v) the IT service portfolio of the Techno-Park. **Activity 2. Providing and installing IT equipment & devices.** This also include the adaptation of infrastructure required to install equipment. The equipment will be used for technological research/development, nurturing IT manpower and fostering IT SMEs/startups. **Activity 3. Fostering IT professionals and Techno-Park human resources.** This activity includes training of IT professionals. It also includes nurturing the human capital of Colombian Techno-Parks and government entities which may require visits to Korean Techno-Parks. In particular, it is key to

	train them on management of intellectual property rights and commercialization of knowledge-intensive or intangible products. **Activity 4. Fostering IT businesses.** This activity comprised Business matching opportunities for early stage startups and SMEs in IT sector, Technology Transfer & Investment Promotion, as well as, a strategy to install business R&D units into the park's facilities.
Project duration	4 years (2024-2027)
Desired Start Date	January 1st, 2024
Donors providing funding	US$ 7 million
Organization funding	Funding will be provided by MSS. IDB/CTI will execute the Project in collaboration with Korean government authorities and Colombian government authorities (DNP).

1. Objective and Justification of the Project

1.1 **Objective**. The objective of this Project is to foster the digital industrial ecosystem in Santander, one of Colombia's most strategic departments, by the strengthening of IT capabilities of Guatiguará Techno-Park. The project will: (i) Provide and install high-tech IT equipment and utilities to guarantee the access of Colombian firms to cutting-edge technology; (ii) Nurture IT specialists and support SMEs, startups, and entrepreneurs in the IT sector for supporting the IT sector development; and (iii) Strengthen international cooperation in the IT field between the Republic of Korea and Colombia.

1.2 **Justification. The National Development Plan 2022-2026 aims to develop the digital industry and to strengthen the National STI System.** The national government recognizes the key role of digital industries and for this reason aims to consolidate Colombia as a developing and exporting country of digital technology goods and services. For this reason, during the next four years, the national government will develop and implement a strategy for enhancing the adoption of digital technologies in the productive sector (National Planning Department, 2022). Also, it will focus efforts on strengthening University-Industry linkage and closing technological gaps among the diverse regions of the country.

On the other hand, the regional innovation system of Santander is mature and exhibits a great potential for the IT sector of the country. According to the Regional Innovation Index for Colombia - IDIC (2021), Santander is ranked 4th in the country since it exhibits a medium-high performance level and showing strengths regarding its Higher Education Institutions, human capital for STI, R&D intensity, the development of digital ventures and IT technologies.

Hence, strengthening Guatiguará Techno-Park would contribute to solve structural problems of the country related with STI. Colombia exhibits low level of R&D expenditure,

limited cooperation between universities and companies and low capabilities and weak institutionality of supporting entities. Strengthening Guatiguará Techno-Park will set the suitable conditions to foster the University-Industry linkage enhancing technology transfer and increasing the pertinence of knowledge production. Also, this project will improve the scientific and technological infrastructure of the park and facilitate the establishment of national and international firms on its facilities which will allow researchers and IT firms to have access to high-end technology and improve the synergy of the national IT sector with international counterparts.

Finally, the stages of the project are designed to enhance the IT sector contributing to the objective of the national government to boost this strategic sector. First, to support the development the IT sector and bring sustainable economic growth, the project will establish a master plan for the IT sector, thereby securing the basis for its operation. Second, the project will provide and install IT equipment or utilities. Third, the project will strengthen the capabilities of the human capital of Techno-Parks and will train IT professionals. Finally, the project will implement a corporate support program and foster IT SMEs and startups. By deploying these four components, the project seeks to address the development of the IT sector, the generation of IT jobs and the specialization of skilled labor.

1.3 **Lessons Learned.**

Align the Techno-Parks with National priorities and train human resources to successfully manage these entities. 1) Techno-Parks must be aligned with national priorities to be successful. They cannot be isolated efforts from regional governments; 2) Techno-Parks must focus in strategic sectors and on specific areas for achieving specialization; and 3) Human capital trained specifically in managing and developing Techno-Parks is required for getting successful results given the complexities of this spaces.

Encourage and promote incentives to increase University-Industry collaboration. Barriers to promote University-Industry collaboration include: 1) Scarce incentives for the research carried out within the academy to be related to the productive sector's needs; 2) Universities and supporting entities have low managerial and commercial capabilities, making it challenging for them to interact with the productive sector; 3) Cooperation in STI projects requires developed capabilities to negotiate technology transfer or licensing contracts and manage generated intellectual property.

2. Beneficiary:

2.1 **Direct beneficiary.** The Guatiguará Techno-Park located in the municipality of Piedecuesta, within the Bucaramanga Metropolitan Area. This metropolitan area has a population of approximately 1.4 million people and is located inside Santander department on the northeast part of Colombia. The park focuses on four strategic areas: i) Biotechnology and agro-industry; ii) Energy resources; iii) Materials and nanoscience; and iv) Information and Communication Technologies (ICT).

2.2 **Indirect beneficiary.** The project will also benefit all the Techno-Parks of Colombia since they will have access to human capital training programs. Current Techno-Parks initiatives are: La Umbría Techno-Park; TECNICAFÉ; Caldas Techno-Park; Caribbean Techno-Park;

Bogota STI District. Another beneficiary of this project will be the Industrial University of Santander which hosts and manages Guatiguará Park.

3. Country Background

3.1 **According to the National STI Policy (2022-2031), Colombia exhibits low knowledge production levels and scarce technology transfer to the industry.** Among the several causes, it is relevant to highlight the low level of national R&D investment, low synergy of the University-Industry relation, low capabilities on supporting entities[1] of the National Innovation System and high regional heterogeneity in STI capabilities.

3.2 **Colombia has a low level of STI investment.** By 2021, Colombia invested 0.28% of its GDP in R&D activities, which places the country below comparable Latin American countries. In addition, the resources for developing STI activities are unbalanced or in a nascent state of action.

3.3 **Supporting entities of the National Innovation System have low capabilities and weak institutionality.** Although 41% of the entities have laboratory services, 92% of the tests they carry out still need certification. These entities have a high staff turnover since at least 45% of the center staff is involved in developing temporary technology projects and services. This is a recognized problem in the literature since high staff turnover affects the institutional knowledge base, generates additional costs, and affects the organizations' effectiveness (Fidalgo & Borges, 2012). Finally, 64% of these entities depend financially on the availability of third-party resources, and only 28% obtain their primary income from the sale of services (Ministerio de Comercio, Industria y Turismo, 2020), which limits medium and long-term planning.

3.4 **On the other hand, the IT sector in the country presents weaknesses that hinders its participation in global value chains.** The country exhibits low ICT adoption in the productive sector and low generation of high-tech product and services for the fourth industrial revolution which hinders the efforts of the country to reach the global productivity frontier (National Planning Department, 2019).

4. Country Development Strategies and Policies

4.1 **The development of Science and Technology parks has been on Colombia's policy agenda for almost a decade.** Techno-Parks where officially defined and recognized in the article 12 of the Law 1753 of 2015 which issued the National Development Plan 2014-2018. This article defined Techno-parks[2] and stated the development of a national strategy to foster Techno-Parks (Law 1753, 2015). As a result, Techno-Parks were included in the STI sector guide and recognized officially as an actor of the National Innovation System since 2016.

[1] Entities that facilitate the flow of knowledge and the link between those who work in its generation and those who apply it, such as Business Incubators, Science and Technology Parks, Research Results Transfer Offices, among others (National Planning Department, 2021).

[2] Techno-Parks are defined as a particular geographical area aimed at promoting innovation based on scientific and technological knowledge and contributing to business productivity and regional competitiveness.

Also, these parks were included among the entities that can apply to become free trade zones according to the article 30 of the Decree 2147 of 2016. Finally, the National STI Policy include actions to foster capabilities of supporting entities and improve their engagement with firms.

4.2 **Colombia has developed policies for supporting the Information Technology (IT) industry development.** On 2019, the government issued the National Digital Transformation and Artificial Intelligence Policy which encourages international partnerships for innovation and the development of initiatives to support entrepreneurship and digital transformation (National Planning Department, 2019). Then in 2021 the National STI Policy 2022-2031 was issued, and it establishes actions to strengthen public training programs in technologies related with the fourth industrial revolution and to foster technology transfer and adoption (National Planning Department, 2021). On the other hand, the National Development Plan 2022-2026 includes the development of digital technologies as a country priority.

5. Description of Activities/Components

5.1 **Objectives.** To foster the digital industrial ecosystem in Colombia by the strengthening the IT capabilities of Guatiguará Techno-Park. The project will: (i) Provide and install high-tech IT equipment and utilities to guarantee the access of Colombian firms to cutting-edge technology; (ii) Nurture IT specialists and support SMEs, startups, and entrepreneurs in the IT sector for supporting the IT sector development; and (iii) Strengthen international cooperation in the IT field between the Republic of Korea and Colombia.

5.2 **Activity 1. Establishment of IT Masterplan and Operational Manuals of Technopark.** This includes (i) the transferring of the “Operation model of Korean Technopark”; (ii) the preparation of operational plans including laws/systems, regulations, and organizations regarding policy on IT industry development; (iii) the establishment of annual operation manuals and self-reliance plan; (iv) the articulation strategy with government entities and international Techno-Parks; and (v) the IT service portfolio of the Techno-Park.

5.3 **Activity 2. Providing and installing IT equipment & devices.** This also include the adaptation of infrastructure required to install equipment. The equipment will be used for technological research/development, nurturing IT manpower and fostering IT SMEs/startups.

5.4 **Activity 3. Fostering IT professionals and Techno-Park human resources.** This activity includes training of IT professionals through the guidance of Korean experts. It also includes nurturing the human capital of Colombian Techno-Parks and government entities which may require visits to Korean Techno-Parks. In particular, it is key to train them on management of intellectual property rights and commercialization of knowledge-intensive or intangible products.

5.5 **Activity 4. Fostering IT businesses.** This activity comprised Business matching opportunities for early stage startups and SMEs in IT sector, Technology Transfer & Investment Promotion, as well as, a strategy to install business R&D units into the park’s facilities.

6. Outcomes

6.1 **Short term:**

a. Boost the scientific and technological capabilities of Guatiguará Techno-Park for the IT sector in areas such IoT, Big Data, Could Computing, Artificial Intelligence and others necessary for a successful development of this sector.
b. Enhance the capabilities of Colombian Techno-Parks with regards to human resource development and management through the implementation of comprehensive training programs.
c. Trained IT professionals on cutting-edge technologies.
d. Enhance Guatiguará Techno-Park alignment with the National priorities through the development of an IT sector masterplan based on the operation model of Korean Techno-Parks.
e. Provide systematic and diverse corporate support programs for IT SMEs and entrepreneurs.
f. Develop a business model based on knowledge products, with a developed portfolio of services.

6.2 **Long term:**

a. Enhanced and boosted Technological transfer and commercialization of IT technologies.
b. Improved investment climate and creation of a favorable environment for enhancement IT companies' competitiveness.
c. Creation of jobs for highly qualified specialists in the IT and industrial sectors.
d. National Techno-Parks recognized as relevant places for fostering STI and articulated between them.
e. Strengthened process for recognition of Techno-Parks which is carried by the STI Ministry.
f. Strengthened industrial and commercial relations between Colombia y South Korea.

6.3 **Outputs:**

a. Strengthened Guatiguará Techno-Park to carry out R&D activities with high tech IT equipment and serving as an information hub for exchanging knowledge and experience related to the IT sector.
b. Developed IT educational programs which include advanced training/seminar programs for IT professionals, corporate support, among others.
c. Trained management teamwork of Techno-Parks and IT corporate support managers with wide knowledge and experience in respective areas.
d. Effective IT Masterplan for operation of Techno-Park.
e. Attraction of business/investment/funding organizations that contribute to the development of the IT sector in Colombia.

7. Stakeholder Analysis

7.1 **Target Beneficiary:**

Direct beneficiary group consists of:

a. Guatiguará Techno-Park and it's 600 collaborators (Employees, scientist, managers, and operational workers).
b. Industrial University of Santander. This university hosts and manages Guatiguará Techno-Park. Hence, all the academic community will be beneficiaries of the project.
c. Government officials and staff from the STI Ministry, National Planning Department, and ICT Ministry in charge of developing policy and strategy regarding STI and IT.
d. Employees of Techno-Parks and IT professionals, who will participate in the training programs of the project to improve their knowledge and base skills.
e. National and international IT firms.

Indirect beneficiary group consists of:

a. Residents of Guatiguará Technopark, such as digital technology companies, undergraduate and graduate students, researchers, and young entrepreneurs as well as common citizens who are interested in engaging with IT and S&T services.
b. Current firms that are clients of Guatiguará Technopark's services: Ecopetrol, the National Hydrocarbons Agency, the Colombian Geological Service, and firms in the pharmaceutical, orthopedic implant, and mining sectors.

7.2 **Other Stakeholders:**

- The Inter-American Development Bank (IDB), through The Competitiveness, Technology, and Innovation Division (IFD/CTI). Executing agency.
- National Planning Department. The unit responsible for the coordination of the project at the Government level will be the directorate of Science, Technology and Innovation through its deputy director. The DNP will be the partner government entity and project coordinator.
- STI Ministry.
- ICT Ministry.

8. Monitoring and Evaluation

A Monitoring and Evaluation committee will be established, and it will hold meetings monthly. This committee will be formed by delegates from DNP and the national government, the director of the Guatiguará Techno-Park and the project director. Also, an executive committee will be held each semester with delegates from the IDB, the

Korean government, the National Planning Department, the Techno-Park director, and the director of the project.

9. Executing agency and execution structure

9.1 **Implementing Organization:** The Inter-American Development Bank (IDB), through The Competitiveness, Technology, and Innovation Division (IFD/CTI) will be responsible for the technical supervision and administration, including reporting, of this Project, given its expertise in the execution of technology and innovation-oriented projects in Latin America and the Caribbean. The National Planning Department of Colombia (DNP) will act as beneficiary government technical counterpart and will coordinate the execution of the Project under the technical supervision of the IDB, and in coordination with other government agencies involved, including the STI Ministry and ICT Ministry. All activities to be executed under this Project will be contracted in accordance with IDB policies.

9.2 **DNP (Government Coordinator):** the DNP through its STI directorate will coordinate the project, along with the advice of STI Ministry and ICT Ministry.

9.3 **Project Team:** A specialized team composed of skilled professionals with relevant expertise will be established to manage and execute the project's operations. This team will have at least project director, management team, operation team, and etc.

9.4 **South Korea:**

- Government: Ministry of Foreign Affairs, Ministry of SMEs, and Startups.
- Korea IT/ICT/Digital Technology-companies which want to expand to Latin America region (joint venture, export, outsourcing etc.)