

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PANAMA

**MULTIPHASE PROGRAM FOR TECHNOLOGICAL
TRANSFORMATION – PHASE I**

(PN-0158)

LOAN PROPOSAL

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ELECTRONIC LINKS AND REFERENCES	
REQUIRED	
1.	Annual work plan [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1347500
2.	AWP years 1 to 3 consolidated [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1344833
3.	Monitoring and evaluation plan [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1361939
4.	Safeguard and screening form for project screening and classification (SSF) [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1347057
5.	Procurement plan [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=133330
OPTIONAL	
1.	Economic Analysis 1: Financial evaluation of Component 1 [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1348177
2.	Economic Analysis 2: Economic evaluation of Component 2 [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1346201
3.	Economic Analysis 3: Demand analysis for Component 1 [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aCspx?DONUM=1346184
4.	Project Cost Analysis [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1344995
5.	Institutional Analysis [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1346093
6.	Operating Regulations [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1349454
7.	Relationship of PN-0158 to other Bank programs [Issues Addressed*] http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1337046

8. Phase II Triggers Matrix
Issues Addressed*]

<http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1349364>

ABBREVIATIONS

ICT	Information and communication technology
IDB	Inter-American Development Bank
PENCTI	Plan Estratégico Nacional para el Desarrollo de la Ciencia, Tecnología y la Innovación [National Strategic Plan for the Development of Science, Technology, and Innovation]
PMCU	Program Management Control Unit
SENACYT	Secretaría Nacional de Ciencia, Tecnología e Innovación [National Secretariat for Science, Technology, and Innovation]

PROJECT SUMMARY

PANAMA MULTIPHASE PROGRAM FOR TECHNOLOGICAL TRANSFORMATION – PHASE I (PN-0158)

Financial Terms and Conditions					
Borrower/executing agency: Republic of Panama National Secretariat for Science and Technology Innovation			Amortization period:		25 years
			Grace period:		7 years
			Disbursement period:		7 years
Source		Amount	%	Inspection and supervision fee:	(*)
IDB (Ordinary Capital)		US\$19,700,000		Interest rate:	Variable
IDB (FSO)		0		Credit fee:	(*)
Other/cofinancing		0		Currency:	U.S. dollars from the Single Currency Facility
Local		US\$9,300,000			
Total		US\$29,000,000			
Phase II		US\$50,000,000			
Project at a glance					
Project objectives and description: The general objective of the program is to help Panama achieve sustainable economic growth. The specific objective is to boost Panama’s capacity for research, development, and innovation in economic sectors that are key to growth. To this end, financing will be provided for three components to encourage innovation, research, human capital capacity building in science and technology, and the institutional capacity of the national innovation system to coordinate and implement science, technology, and innovation policy.					
Special contractual conditions: (i) as conditions precedent to the first disbursement, the borrower must submit to the Bank: (a) the executing agency’s express written commitment received from its legal representative, authorized by its board of directors, to fulfill its obligations as executing agency; (b) evidence that the program Operating Regulations are in effect; and (c) evidence that the personnel needed to operate the Program Management Control Unit has been selected; (ii) prior to the first disbursement of the financing for grants for the graduate study abroad component, the borrower must submit the agreement signed with the Instituto para la Formación y Aprovechamiento de Recursos Humanos [Institute for Human Resources Training and Development] to execute the subcomponent according to a model agreed with the Bank; (iii) prior to the transfer of loan proceeds to each beneficiary university for the Component 2 subcomponent to support graduate study abroad and to attract international talent, the borrower must submit the agreement prepared according to a model previously agreed with the Bank and signed with the respective university; (iv) prior to the onlending of the financing to each research entity under the Component 3 subcomponent to support the excellence of research institutes (SNI institutional strengthening), the borrower, through the executing agency, must submit to the Bank an agreement signed with the entity as previously agreed with the Bank; (v) prior to the first disbursement for the “consultation mechanisms strengthening” Component 3 subcomponent, the borrower must submit evidence that the design of this mechanism has been finalized; (vi) prior to the first disbursement for the “organization of internal control and sector targeting subcomponent of Component 3, the borrower must demonstrate that the means of strengthening this capacity has been designed.					
Exceptions to Bank policies: None.					
Project qualifies as:		SEQ []	PTI []	Sector []	Geographic []
Project consistent with country strategy:		Yes [X]	No []		Headcount []

* The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable provisions of the Bank's policy on lending rate methodology for Ordinary Capital loans. In no case will the credit fee exceed 0.75% or the inspection and supervision fee exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

I. DESCRIPTION AND MONITORING OF OUTCOMES

A. Background, problem, and rationale

- 1.1 Innovation can and should play a greater role in Panama's economic growth. Several of the country's economic indicators are very encouraging. With the help of large-scale flows of foreign investment, Panama has experienced strong economic growth since the early 1990s. In recent years this growth has been accompanied by a significant rise in exports, which went from a negative growth rate in the 1993–2003 period to 12.5% in 2004 and 2005 and over 20% in 2006. Panama ranks 41st out of 125 countries in the Global Innovation Index (World Economic Forum, 2006–2007), behind only Chile and Mexico among countries in Latin America and the Caribbean.
- 1.2 Against this backdrop, Panama is clearly well positioned to continue on a path of sustained development. However, it will have to address the pending challenges and enhance its capacity to take advantage of its newly emerging opportunities.
- 1.3 Among the most significant challenges is raising factor productivity, which made a negative contribution to growth between 1971 and 1990, and contributed only 1.2% in the 1991–2000 period. Given the enormous weight of services in the Panamanian economy (78% of GDP), improving the quality of human resources is crucial to fulfilling this objective.
- 1.4 Particularly noteworthy in terms of opportunities is the widening of the Panama Canal, with all its implications for demand for highly sophisticated logistical and communications services, as is the increasing value of Panama's rich biodiversity as a unique asset for the development of biosciences.
- 1.5 This combination of challenges and possibilities underpins the country's determination to strengthen its scientific and technological capacity and redouble its efforts to promote business innovation.
- 1.6 **SENACYT, technological coordination, and previous Bank assistance.** The National Secretariat for Science, Technology, and Innovation (SENACYT) is responsible for coordinating national policy on innovation, removing obstacles to the free and flexible use of technology, and building new technical capacity (for businesses, institutions, and professionals). The Secretariat is organized into five departments: Research and Development; Business Innovation; Learning; Management; and Operations, Administration, and Finance (www.senacyt.gob.pa). SENACYT has a board of directors that includes the Minister of the Office of the President and the Minister of Education, as well as representatives of the private sector and the academic community. The Interministerial Council on Science, Technology, and Innovation (CICYT) facilitates coordination with relevant ministers, while the National Commission on Science, Technology, and Innovation (CONCYT), which brings together academics and members of the public and private sectors, provides guidance in identifying priorities. The SENACYT national secretary also sits on the Presidential Education Commission and the Ministerial

Commission on Innovation and Competitiveness, and attends the Panamanian Cabinet Council as well.

- 1.7 This is the third loan for the science and technology sector that the Bank has made to Panama. SENACYT was the executing agency for two of these operations. The first operation in support of producing sector competitiveness (see lessons learned and PCR [1108/OC-PN](#), US\$14.2 million, 1998–2003) strengthened the institutional capacity of the newly created SENACYT and increased the technological capacity of businesses and technological development centers. It financed the Technological Modernization Fund, which supported 181 projects for small businesses, and the Research and Development Fund, which provided financial backing for setting up essential basic laboratories. The second operation (Support for Implementation of a Science and Technology Center in Panama; see PCR [1273/OC-PN](#), US\$3.3 million, 2000–2004) provided organizational, marketing, and telecommunications support for the newly created City of Knowledge.
- 1.8 The progression of the Bank's support paralleled the stages that the economy passes through in technological learning: (i) building basic institutional capacity and an environment more conducive to the learning and use of technologies (1108/OC-PN); (ii) encouraging investment in technology adoption and dissemination (1273/OC-PN), e-commerce development (ATN/ME-8081-PN), and Business Acceleration (ATN/ME-7469); and (iii) promoting accelerated investment in more creative technological innovations and the use of foreign investment in the present operation. Consequently, Panama now has more capacity to contribute to economic growth.
- 1.9 **Principal opportunities and challenges.** The main challenge is to further reduce the cost of technology search, adoption, and research in order to provide more profitable and appealing investments for a wider range of businesses and professionals. To this end, the scant financial and human resources should be better allocated so as not to dilute its contribution while strengthening a large number of sectors for which a critical mass is difficult to obtain, due either to a lack of resources or to doubts about the viability of its target markets. The challenge is to target a few sectors with the potential both to develop ideas and knowledge on goods and services, and to serve identifiable international markets in which to sell them. SENACYT reached an agreement with the Bank on prioritizing three sectors that can add technology-based value to goods and services. These represent opportunities, but obstacles also loom, such as: (i) inadequate financing for technology adoption and research and development, (ii) insufficient human capital, and (iii) an absence of facilitating institutional mechanisms.¹
- 1.10 **Logistics and transportation.** The services exported by this type of businesses account for more than 65% of all exports. The main subsectors are: (a) maritime transfer (ports), (b) interoceanic transit (canal), (c) merchant navy, and (d) aerial

¹ See Plan Estratégico Nacional para el Desarrollo de la Ciencia, Tecnología y la Innovación [National Strategic Plan for the Development of Science, Technology, and Innovation] (PENCTI).

transfer (airports). The canal has once again become the primary engine of Panamanian economic activities, with strong multiplier effects. Thus, a number of privatized ports and more than 140 maritime and aviation companies are springing up in the canal. For example, a Singapore-based firm recently established itself around the canal zone to repair and rebuild aircraft, with plans to employ 1,000 Panamanian engineers. All of this activity may be accelerated with the major expansion of the canal, but the country must be able to satisfy the growing demand for skilled personnel. There are also technical (organizational and infrastructural) deficiencies in local businesses that fall short of international standards, which may be corrected through innovations to reduce their high operating costs or achieve the necessary standards to do business with multinational firms.

- 1.11 **Biosciences.** There is an extensive history and infrastructure in Panama associated with tropical diseases. Recently, the sector's main activities have been: (i) biomedical research headed by the Instituto Conmemorativo Gorgas de Estudios de la Salud [Gorgas Memorial Health Studies Institute] (www.gorgas.gob.pa)—an experience dating back to the construction of the canal (the fight against yellow fever, malaria, etc.)—and by the laboratory of the Instituto de Investigaciones Científicas Avanzadas y Servicios de Alta Tecnología, established by SENACYT in 2003 in the City of Knowledge; (ii) tropical sciences, headed by the Smithsonian Tropical Research Institute (STRI) (www.stri.org); and (iii) new treatments for tropical diseases, led by Health Research International, which performs clinical trials through the cluster associated with these diseases. Sector-specific studies and workshops found that Panama should follow a strategy targeted to the expansion of the following: development and testing of anti-malaria and other anti-infectious disease medications; the fight against HIV/AIDS; identification of emerging pathogens and biodefenses; promotion of clinical trial sites; and the search for medications made with natural products. The target market is the increasing demand for drugs—vaccines and other remedies—in developing countries such as Thailand, India, and Brazil. To allocate resources effectively, agreement should be reached on the niche and then the technological infrastructure should be expanded and the marketing strategy strengthened. It is equally important to remedy the research centers' lack of knowledge on intellectual property. Expertise should also be built in commissioning appropriate firms and negotiating business arrangements, such as licensing. Lastly, low levels of public financing should be remedied, as should low levels of private-sector investment in research and development and marketing.
- 1.12 **Information and communication technology (ICT) sector.** Despite its critical role in providing efficient, high-quality services, the ICT sector is far from reaching its potential. The sector is estimated to consist of some 200 companies,² most of them midsized and small, devoted mainly to selling technological goods but also to providing services. A large percentage of these companies are regional offices of

² Cámara Panameña de Tecnologías de Información y Telecom [Panamanian Chamber of Information and Telecommunications Technologies] (CAPATEC) (www.capatec.org.pa).

international firms, which have established themselves in Panama on account of its geographic location and tax incentives. Few provide technological consulting services, systems development and integration, and outsourcing. The sector has a mid-to-low innovation profile, and the limitations facing businesses are mainly a lack of information technology and telecommunications specialists, specifically software engineers and programmers; engineers' low level of educational achievement at the university level in key areas such as algorithms, programming, network design and configuration, and English; the lack of an entrepreneurial culture; and a lack of access to financing for research and development (R&D) and innovation to start new technology-based businesses.

- 1.13 **Specialized human capital.** The Panamanian economy has limited human resources skilled in the use of innovative technologies. The ratio of 158 available researchers per one million inhabitants (compared to 257 per million in Costa Rica) is very low. Also, Panama ranks 102nd in the availability of scientists and engineers and 91st in the quality of scientists and research centers, compared to Costa Rica's 37th- and 38th-place rankings, respectively (World Competitiveness Report, World Economic Forum). These rankings are in contrast to the research and educational needs of businesses, research centers, and universities if they are to fulfill the country's development objectives. The poor performance of human resources is rooted in the following weaknesses: (i) a traditional lack of investment in R&D; (ii) the recent decrease in the number of university graduates in science and engineering;³ (iii) a lack of opportunities to study engineering and sciences at the Master's level, as existing programs focus on part-time coursework for working professionals, with limited capacity to generate R&D or technological activity; (iv) weak collaboration between industry and universities; and (v) scant interest shown by primary and secondary school students in science and technology.⁴ This means that Panama faces multiple challenges in developing human resources in science and technology: in the short term, it must ensure the training of highly skilled professionals in science and technology (at the Master's and doctorate levels), and strive to retain these professionals as scientific specialists. Meanwhile, demand for science-related careers should be boosted by enhancing the quality of science education, with particular support for talented youth.
- 1.14 **Capacity to facilitate technological change.** There are at least three main challenges in facilitating technological transformation in Panama. The first is to strengthen SENACYT's capacity to design, implement, and monitor policies on science, technology, and innovation. This includes improved management and access to relevant information from members of CICYT, CONCYT, and the SENACYT Board of Directors. Secondly, more emphasis needs to be placed on sector-specific innovation systems—not just sector-specific policies and

³ The number of university graduates in the sciences decreased from 16 to 10 percent of all university graduates between 2002 and 2004.

⁴ SENACYT has been testing new pedagogical methods and educational content for the last eight years (PEACYT).

regulations, but centers for technological development and transfer. The country's accelerated growth requires greater intermediation capacity between users and providers of technological services (both local and international). This is valuable for local businesses interested in exploring the requirements and opportunities for providing input to international companies operating in Panama or abroad. Thirdly, there is a lack of sector-focused analytical bodies to evaluate and forecast opportunities and to promote coherent policies as part of a national agenda for sector-specific scientific and technological progress. See the above link for PENCTI.

- 1.15 **Rationale for the multiphase program.** The Government of Panama expressed interest in a two-phase program so that lessons from the first phase may be applied to the second phase. Phase I of the proposed multiphase program will increase financing for businesses for technological change, and will support the expansion and deepening of human capital to provide services directly or indirectly to businesses. The program will focus on improved coordination of priority sectors in the national system of technological innovation. The direct program beneficiaries will be businesses, R&D centers, educational institutions, and key parties supporting the coordination of technological change. This will alleviate the lack of financing for the early stages of technical improvements introduced by businesses. The program will have a positive impact on sales of new or technologically improved products and labor productivity. Phase II calls for IDB financing of US\$50 million to strengthen and provide continuity for the Phase I components drawing on the lessons learned, and will include the strengthening of science and technology infrastructure.
- 1.16 **Sizing of Phase I and Phase II.** Mechanisms for nonreimbursable contributions to existing businesses have been used by SENACYT since 1999, and a projected demand for these contributions in strategic sectors yielded the budgetary estimates allocated to Component 1. (See the electronic link, "Demand Analysis" for Component 1). Similarly, the demand analysis for professionals at the Bachelor's, Master's, and doctorate levels (see electronic link, "Economic Analysis 2: Economic Evaluation" for Component 2) identified the unmet demand, estimating high internal rates of return (8% to 16%) for investment in human capital highly skilled in sciences in Panama. While the Panamanian government has undertaken major actions in human resources for science and technology,⁵ the program will expand activities such as: graduate study grants, improved science education, Master's programs in sciences, etc. The institutional strengthening effort was sized on the basis of the most pressing technical support needs described in the institutional analysis (see the electronic link, "Institutional Analysis"), as well as the recommendations from CICYT and other agents involved with SENACYT's policies.

⁵ Between 2005 and 2007, 87 study grants for doctoral studies and 65 for Master's studies abroad were granted in all disciplines. The Bank's program will help expand these activities and concentrate them in areas of science identified as strategic in the framework of SENACYT's policies.

B. Objective, components, and costs

- 1.17 The general objective of the program is to contribute to sustainable economic growth in Panama. The specific objective of the program is to boost Panama's capacity for research, development, and innovation in sectors that are key to economic growth. To this end, financing will be provided for three components to encourage innovation, research, human capital capacity building in science and technology, and the institutional capacity of the national innovation system to coordinate and implement science, technology, and innovation policy.
- 1.18 **Component 1: Support for research, development, and innovation (US\$11,836,000).** This component will expand and strengthen the existing means of promoting and cofinancing R&D and technological innovation projects by targeting the three key sectors. Two subcomponents have been agreed on. Subcomponent 1 is *support for technological innovation*. The proceeds of this subcomponent will cofinance: (a) innovation projects in existing or newly created businesses; (b) innovation projects for university entrepreneurs; and (c) events to exhibit and demonstrate new technologies, aimed at priority sectors. Subcomponent 2 is *support for research and development*. The resources allocated to this component will cofinance: (a) studies to identify technological restrictions and/or problems in priority sectors that can be solved through R&D; (b) R&D projects in businesses, business associations, universities, and/or research centers; (c) strengthening of R&D centers of excellence; (d) integration of the Panamanian research community in international R&D networks, to expand and strengthen its participation in international networks for the exchange and generation of knowledge.
- 1.19 **Component 2: Human capital development for science and technology (US\$8,209,000).** This component will invest in improving the quantity and quality of human resources needed by the national system of science, technology, and innovation. It will invest in learning at the basic and higher education levels, as well as in university teaching, thus meeting the short-, medium-, and long-term human resource needs in order to raise the quantity and quality of students pursuing a career in science and technology. This component will provide financing for the following subcomponents: (i) *strengthening of science education based on primary and secondary research*, including the procurement and distribution of teaching materials, and workshops for educators and school principals; creation of an executing unit for the "Hagamos Ciencia" [Let's Do Science] program, which coordinates SENACYT activities in support of the Ministry of Education in science education; and consulting services to evaluate this program, as well as resources for identifying and supporting children recognized as gifted in science (in coordination with the Ministry of Education); (ii) *support for discovery and monitoring of talent in science*, by commissioning specialized services to create a system for early identification of talent in science in preschool, primary school, and secondary school students and establishing a suitable network of services to encourage interest in science; (iii) *support for the national research system*, which will provide

incentives to researchers, research groups, and centers of excellence to expand the human resource base devoted to science and technology; (iv) *graduate study grants abroad and to attract talent from abroad*, aimed at the three key sectors; and (v) *program to support graduate students in science and technology programs in public universities*. Some subcomponents do not target, strictly speaking, the three key economic sectors because, as in the case of the “Hagamos Ciencia” program, they require a multidisciplinary basic education so that graduates may later specialize or target their studies.

- 1.20 **Component 3: Institutional strengthening of the national innovation system (US\$7,111,000).** This component will improve the national capacity to coordinate the technological transformation. Specifically, it calls for resources to finance the following subcomponents: (i) *establishment of think tanks* on execution or reformulation of PENCTI policies; (ii) *support for excellence in public research institutes* (CENAMEP, INDICASAT, ICGES, IDIAP, and ARAP) for procurement of equipment, consulting services, and training, and financing for study grants not necessarily in the three key sectors; (iii) *organization for internal control and sector targeting* of the program and PENCTI. It will finance the action plan emerging from the SENACYT technical-cooperation project (Institutional Strengthening) (ATN/KK-10904-PN), including the implementation of an indicator system, a management system, a science and technology public information campaign, and consulting services to improve SENACYT’s regulations for managing technological innovation and R&D⁶ that includes aspects of the Operating Regulations.
- 1.21 **Coordination with other Bank projects.** This program is related to two Bank operations promoting business competitiveness and development: (i) “Support for Dynamic Entrepreneurship” (PN-M1013), with Fundación Ciudad del Saber, in preparation; and (ii) the multiphase loan operation for Competitiveness and Trade Liberalization (1941/OC-PN), approved in December 2007. To eliminate the risk of overlap with the latter operation, SENACYT, the Ministry of Finance, and MICI agreed that SENACYT would evaluate the proposals received by the Technological Innovation and Transfer Fund, financed under loan 1941/OC/PN (see electronic link, “Relationship of PN-0158 to other Bank programs”).
- C. Cost, currency, and financing**
- 1.22 The total cost of the program is US\$29,000,000, of which US\$19,700,000 will come from the Single Currency Facility of the Bank’s Ordinary Capital. The local counterpart contribution is estimated at US\$9,300,000 equivalent, which may include up to US\$5,000,000 equivalent as a contribution from the private sector in the form of cofinancing for innovation, education, or human capital formation.

⁶ Some aspects of the SENACYT regulations to manage its innovation and R&D programs should be revised in view of the program’s Operating Regulations.

- 1.23 **Retroactive recognition of expenses:** The Bank will recognize disbursements made by the executing agency in connection with preparatory or initial program activities within an 18-month period prior to approval of this operation by the Bank's Board of Executive Directors, to a maximum of US\$1 million equivalent against the Bank financing and to a maximum of US\$2 million against the local counterpart contribution.

Table II-1. Program costs and financing, Phase I (US\$000)

COMPONENTS	IDB	LOCAL	TOTAL
Component 1. Support for research, development, and innovation	8,425	3,411	11,836
1.1. Support for technological innovation	4,125	2,271	6,396
1.2. Support for innovation and development	4,300	1,140	5,440
Component 2. Human capital development for science and technology	6,067	2,142	8,209
2.1. Support for science education in primary and secondary schools	2,056	1,091	3,146
2.2. Support for identification of talent	457	675	1,132
2.3. Support for national research system	429	219	648
2.4. Scholarships for graduate study abroad	2,000	26	2,026
2.5. Program to support graduate students in science and technology	1,125	131	1,256
Component 3. Institutional strengthening	3,414	3,697	7,111
3.1. Establishment of mechanisms for analysis and consultation	186	28	214
3.2. Support for excellence in research institutes	1,830	2,364	4,194
3.3. Organization for internal control and sector targeting	1,398	1,305	2,703
Monitoring and evaluation	185	50	235
Administration	1,194		1,194
Contingencies	415		415
Project total	19,700	9,300	29,000

D. Leading outcome indicators

- 1.24 The primary outcomes of the Results Matrix (see Annex I, "Results Matrix") include: Component 1 (Support for research, development, and innovation) with a key indicator being the quantity (19) of new products or services (or improvements to existing ones) from among the projects approved and the companies' increased investment in innovation. For Component 2 (Human capital development for science and technology) indicators were identified which represent improvements in the quantity and quality of human resources demanded by the Panama's national innovation system, at all educational levels and with special emphasis on strategic areas. For example, subcomponent 1 (Strengthening of ICT teaching), the key indicator is that a majority (51%) of all students benefiting from the program show progress (through workshops). Component 3 (Institutional strengthening of the national innovation system) will measure two other dimensions: (a) SENACYT's capacity to provide guidance to actors and institutions and to formulate policy, and (b) SENACYT's institutional sustainability. In both cases, focus groups will be used.

II. FINANCING STRUCTURE AND RISKS

A. Financing, project coordination, and contractual conditions

2.1 The borrower is the Republic of Panama, and the executing agency is SENACYT, an autonomous government agency with legal standing that organizationally reports directly to the President of Panama. SENACYT's autonomous status was conferred under Law 50 of December 2005.

2.2 Special contractual conditions

- a. As conditions precedent to the first disbursement, the borrower must submit to the Bank: (i) the executing agency's express written commitment received from its legal representative, duly authorized by its board of directors, to fulfill the obligations it has assumed as executing agency as specified in the loan contract; (ii) evidence that the project's Operating Regulations have taken effect; and (iii) evidence that the personnel needed to operate the Program Management Control Unit has been selected.
- b. Other execution conditions are: (i) prior to the first disbursement for the graduate scholarship for study abroad subcomponent, the executing agency must submit the agreement that has been signed with the Institute for Human Resources Training and Development to execute that subcomponent according to a model agreed upon with the Bank; (ii) prior to the onlending of the financing to each beneficiary university in the graduate support subcomponent of Component 2, the borrower, through the executing agency, must submit the agreement that has been prepared according to a model previously agreed upon with the Bank and signed with the respective university; (iii) prior to the onlending of the financing to each research entity in support of the research institutes excellence subcomponent in Component 3 (SNI institutional strengthening), the borrower, through the executing agency, must submit to the Bank an agreement signed with the entity as previously agreed with the Bank; (iv) prior to the first disbursement of financing for the strengthening of consultation mechanisms subcomponent for Component 3, the borrower must submit evidence that the mechanism design has been finalized; (v) prior to the first disbursement for the sector targeting subcomponent of Component 3, the borrower must submit evidence that the institutional strengthening mechanism has been designed.

B. Eligibility of Phase II of the program

2.3 Phase II of the program may be submitted to the Bank's Board of Executive Directors for consideration insofar as the objectives of Phase I have been substantively fulfilled. Specifically, in addition to having 40% of the loan proceeds disbursed and 75% committed for Phase I, the borrower must fulfill the following targets and indicators: (i) implementation of each program component, according to the Triggers Matrix for Phase II; (ii) a satisfactory outcomes of an outside midterm evaluation; (iii) a satisfactory evaluation of the audited financial statements and of

the implementation of any recommendations of the external auditor or the Bank. The Phase II milestones or triggers were agreed with the borrower and will be evaluated by the Bank with the help of independent consultants engaged for this purpose (see electronic link, “Phase II Triggers Matrix”).

C. Program risks and mitigating factors

- 2.4 The Bank conducted a risk evaluation according to CSC/CSC (technical archives of the division) guidance and analytical tools. An institutional evaluation (SECI) yielded satisfactory results (see electronic link, “Institutional Analysis”).
- 2.5 **Fiduciary risk.** The operation has a moderate-to-low fiduciary risk (14.57%) (see electronic link, “Institutional Analysis”). SENACYT satisfactorily executed the Bank’s previous loan operation (OC/PN-1108) and subsequently continued to use its own budget to invest and provide services in a transparent manner. The fiduciary risks include frequent staff turnover (26.13%), and are mitigated by the strengthening of control management, greater training, and a Project Management Control Unit with well-defined staff functions. To ensure this strengthening effort, the Bank recently approved a technical-cooperation project for the institutional strengthening of SENACYT (ATN/KK-10904-PN).
- 2.6 **Environmental and social risks.** Given its focus on business sectors and considering the expected benefits, this operation does not qualify as a social equity-enhancing or poverty-targeted investment project, in accordance with the eligibility criteria set out in the Eighth General Increase in Resources (document AB-1704).
- 2.7 The program does not call for the financing of new construction, barring minor renovations in project spaces, and therefore is not expected to cause any negative environmental or social impacts. This operation has been classified as “C” (see “Environmental Safeguards” electronic link). The Operating Regulations will include specific criteria to ensure that the subprojects financed do not generate negative environmental or social impacts. Specifically, it will be a prerequisite for participating businesses to comply with national environmental standards (or be in the process of doing so) and relevant Bank policies.
- 2.8 The program’s online content will be expanded with electronic information on clean technologies and other procedures to recognize the harmful effects on the environment and how to mitigate them.
- 2.9 **Other risks.** There is a moderate risk that the political conditions or political will may not exist to ensure financial, socioeconomic, institutional, and technical sustainability after program completion. This risk has to do with the changes that may emerge as a result of the elections and transfer of power in late 2009. To mitigate this risk, the program takes a two-track approach. First, the multiphase investment loan instrument will provide the means to expedite the procedures for a US\$50 million Phase II by allowing for continuity. Secondly, resources will be provided to inform and train key stakeholders, including lawmakers, so that they recognize the value added to the gross domestic product, as well as the benefits and

advantages of economic and social progress stemming from technological development programs.

III. MANAGEMENT PLAN AND IMPLEMENTATION

A. Summary of the execution plan

3.1 SENACYT will execute the program using existing work mechanisms. The Bank approved the technical-cooperation operation for institutional strengthening of SENACYT (ATN/KK-10904-PN), which will enhance the customer service and technical support platform, as well as the methods for performing economic evaluations of the cofinancing requests from beneficiary businesses, and the control system associated with execution. Design of the new customer support platform, the information system, evaluation, communications, and related training are post-approval design activities that will take place within four months after the effective date of the loan contract, and will be incorporated into the Operating Regulations. These measures are for the sake of efficiency and do not represent an obstacle to beginning execution of any of the components.

3.2 **Program Management Control Unit.** To facilitate the administration of all components, a Program Management Control Unit (PMCU) will be formed to supervise and administer the financial resources, coordinate activities, and report to the Bank on operational and financial matters. The PMCU will be an integral part of the SENACYT organizational structure and will report to the national secretary. The SENACYT management body will be the primary member of the PMCU, with other members assigned from other areas. The PMCU will be responsible for preparing and submitting the annual work plans and regularly updating them, as well as for supervising implementation of the operation and supplying data on fulfillment of the loan objectives. The PMCU will include the following members: an innovation support coordinator, an innovation coordinator for new enterprises, an R&D coordinator, an R&D support coordinator (R&D center promotion), a coordinator for subcomponent 2.i, a special project coordinator, a project execution supervisor, a procurement consultant, and a financial management consultant. Due to the scope of subcomponent 2.i on science education, and its collaborative nature in support of MEDUCA, this subcomponent will have its own executing unit, which will be headed by the executive director of subcomponent 2.i, who will be appointed by SENACYT.

1. Research, development, and innovation (Component 1)

3.3 The execution plan for the nonreimbursable contributions will maintain the system of open bidding that SENACYT has been using. In the area of innovation, SENACYT will increase the number of calls for bids from two to four. The bidding on innovation will be of three types: open bids, area-specific bids, and special bids. The open bids will invite Panamanian businesses to submit business plans associated with the innovation proposal that they seek to finance. Area-specific bids will receive proposals to research and solve problems identified in advance by the

sector-specific committees in each of the program's three priority sectors. Special calls for bids will be held in special cases only when critical research needs not anticipated emerge. The parameters for eligible amounts and evaluation criteria appear in the Operating Regulations (see electronic link, "Operating Regulations").

2. Development of human capital for science and technology (Component 2)

- 3.4 The execution plan for this component will vary according to the different subcomponents. Subcomponent (i), ***strengthening of science education based on primary and secondary research***, will function in accordance with the division of functions between SENACYT and the present Ministry of Education, established under Executive Decree 5 of 5 February 2007; the program directly finances the creation and operation of a specialized unit within SENACYT to lead activities aimed at improving science education at the earliest levels of the education system. Subcomponent (ii), ***support for talent discovery***, will fall to the SENACYT management body. In addition to the existing resources at this management body, SENACYT will hire a full-time project manager and a part-time or temporary team of specialized professionals with program funds. Subcomponent (iii), ***support for the National Research System***, will also be under the responsibility of the SENACYT management body, which will ensure the creation of a Board of Directors, a Technical Secretariat for the program, and an Evaluation Committee for the system. Subcomponent (iv), ***graduate study grants abroad in priority sectors***, will use (with the adjustments required by Bank policies) existing institutional and regulatory arrangements included in the framework cooperation agreement between SENACYT and the Institute for Human Resources Training and Development, for administration of study grant recipients after the grants have been awarded. Lastly, subcomponent (v), ***program to support graduate students in science and technology at public universities***, will finance support for the establishment of a Master's of Science program in information technology and will also be executed by the SENACYT management body and according to the execution structure and regulation already in place for this type of activity. After the university at which this new Master's program is to be housed is selected, SENACYT will transfer the funds for this subcomponent to the university under an agreement.

3. Institutional strengthening of the national innovation system (Component 3)

- 3.5 With the resources allocated to this component, the executing agency and, in the case of the subcomponent for Public Interest Research Institute Excellence, the institutes will award contracts for consulting services, training, minor works, procure equipment, and provide financing for study grants and in-service training. Accordingly, the executing agency and the research institutes will abide by the Bank's procurement policies (documents GN-2349-7 and GN-2350-7 of July 2006). The graduate study grants referred to in subcomponent 3.2 will be coordinated with Institute for Human Resources Training and Development.

- 3.6 **Resource commitment and disbursement periods.** The period for committing resources from the financing will be three years from the effective date of the loan contract. The disbursement period for the financing for subcomponent (iv) (graduate study abroad and the attracting of talent from abroad (Component 2)) and for the financing of study grants under subcomponent (ii) (support for public interest research institute excellence (Component 3)) will be seven years from the effective date of the loan contract. The disbursement period for the loan proceeds for other components and subcomponents will be four years as of the effective date of the loan contract.
- 3.7 **Procurement.** Procurement of goods, works, and consulting services financed wholly or in part with the loan proceeds will be conducted in accordance with the Bank's policies GN-2349-7 (works and goods) and GN-2350-7 (consultants) of July 2006. Financing will be provided for minor works in project spaces in the subcomponent of Component 1 (Support for Research, Development, and Innovation) and the support for public interest research institute excellence subcomponent of Component 3 (Institutional Strengthening of the SNI). The works may not exceed the equivalent of US\$250,000 per project or represent more than 40% of the total project cost. Based on the activities called for under the program and the analyses of institutional capacity, the limit amounts matrix is recommended for determining the procurement method in bidding activity on the project which appears in the procurement plan (see electronic link). Minor modifications to the plan may be made through an exchange of request notes and with the approval of SENACYT and the Bank, respectively.
- 3.8 The Bank will perform ex ante reviews of program procurement for the first nine months. Subsequently, a management evaluation will decide whether the procedure should be switched to ex post review, except where otherwise specified in the procurement plan. The executing agency's capacity will be determined annually based on the opinion of the Bank's Country Office procurement specialist.
- 3.9 **Revolving fund.** The Bank will set up a revolving fund for up to 5% of the loan amount.

B. Summary of the monitoring and evaluation plan

- 3.10 SENACYT is moving forward with an institutional reorganization plan (that includes technical-cooperation operation ATN/KK-10904-PN) to strengthen the foundation for results-based management and the enhancement of administrative and financial processes, all of which will contribute to program monitoring.
- 3.11 The executing agency will commission two independent, external midterm program evaluations—including results of surveys and focus groups—18 months and 36 months into the program. The evaluations will be based on the Bank's new supervision mechanisms: (a) the procurement plan, (b) results matrix, (c) the semiannual progress reports, and (d) the annual work plans. The rationale and the indicators selected for the evaluations are available in the Monitoring and Evaluation Scheme electronic link.

- 3.12 Specifically, the program's effectiveness will be evaluated in terms of the extent to which the program succeeds in significantly increasing investment in innovation, R&D, and R&D staff, as well as the availability of quality science education to address the expected demand of key producing sectors, thus facilitating stimuli and more proactive guidance from SENACYT.

ANNEX I. Outcomes Matrix

Component 1

Objective	To expand and strengthen the current system for promoting and cofinancing research and development (R&D) and technological innovation projects, in order to increase investment in innovation, in R&D, in employees devoted to R&D, and in the emergence of new products.
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Component 1. Research, development, and innovation	Baseline	Year 1	Year 2	Year 3	Target	Source of information*
Subcomponent 1. Support for technological innovation						
Outcomes						
Investment in innovation (% of total investment) (**)	4%	10%	15%	15%	15%	Innovation and R&D Survey
Investment in innovation (% of total sales)	0.8%	2%	3%	3%	3%	Innovation and R&D Survey
Quantity of new products and services (**)	0	0	5	14	19	Program administrative records
Products						
Projects of innovative businesses evaluated	0	60	80	90	230	Idem
Projects of winning innovative businesses	0	7	20	33	60	Idem
Launching of university-based innovation projects	0	1	1	1	3	Idem
Winning university-based innovation projects	0	4	6	6	16	Idem
Consulting services to identify initiatives to exhibit and demonstrate new technologies	0	1	0	0	1	Idem
Events to exhibit new technologies	0	0	0	1	1	Idem
Subcomponent 2. Support for research and development						
Outcomes						
Investment in R&D (% of total investment)	0.75%	1%	1.25%	1.50%	1.50%	Innovation and R&D Survey
R&D employees (% of all employees)	0.75%	1%	1.25%	1.50%	1.50%	Innovation and R&D Survey
Sales of new products or services (% of total sales)	1.50%	3%	4%	4%	4%	Program administrative records
Products						
Workshops to identify technological restrictions	0	1	2	2	5	Program administrative records
Awards to recognize excellence in R&D	0	1	1	1	3	Idem
Training in management of scientific projects	0	3	3	4	10	Idem
Winning R&D projects	0	6	12	12	30	Idem
Projects to strengthen winning R&D centers of excellence	0	1	2	2	5	Idem
Winning projects to integrate the Panamanian research community with international R&D networks	0	1	3	2	6	Idem

(*) The baseline will be revised according to the findings of the R&D survey (October 2008).

(**) Refers to companies supported only by the project.

Outcomes Matrix
Component 2 indicators matrix

Objective	To raise the quantity and quality of human resources needed for Panama's national innovation system at all levels of the educational system, particularly in strategic areas					
Component 2: Development of human resources for science and technology	Baseline	Year 1	Year 2	Year 3	Target	Source of information
Subcomponent 1: Strengthening of science education based on research (Ministry of Education and SENACYT)						
Outcomes						
Improved learning of sciences in Panamanian public schools					Most of the students benefiting from the program show statistically significant progress in science.	Technical evaluation report
Intermediate outcomes						
Program evaluation		Design of the evaluation and baseline commissioned. Pre-test designed, validated, and administered.		Post-test administered and program impact analysis completed.		Program administrative records
Institutional strengthening of the "Hagamos Ciencia" program		Staff hired for the program (7 persons)				Program administrative records
Number of schools in the program	47	120	150	220	220	Idem
Percentage of educators making improvements in their teaching, as determined by an in-class observation instrument	0	50% (900)	60% (2340)	80% (4800)		In-class observation reports
Percentage of educators making sufficient improvements in their teaching to reduce assistance by 50%	0	10% (180)	15% (585)	30% (1800)		In-class observation reports
Outputs						
Workshops for executives	0	10	10	10	30	Program administrative records
Strategic planning workshops	0	1	1	1	3	Idem
Teacher training workshops	0	10	10	10	30	Idem
Material distribution efforts	0	27	30	30	87	Idem
Subcomponent 2: Support for discovery of talent						
Outcomes						
Talent identification system is up and running (providing support to gifted youth)					Support services to at least 300 talented youth up and running	Evaluation report (analysis of database and survey)
Outputs						
Database ready	0	1	0	0	1%	
Number of visits to youth identified as talented	0	100	100	100	300	
Subcomponent 3: Assistance and recognition for science and technology researchers						
Outcomes						
					Panama improves its capacity to retain and attract its scientific community, as well as the productivity capacity of this community.	Evaluation report
Intermediate outcomes						
System members	0	10	20	30	60	
Outputs						
Information system	0	1	0	0	1	
System regulation	0	1	0	0	1	
Meetings of the Evaluation Committee	0	2	2	1	5	
Subcomponent 4: Scholarships for graduate study abroad and to attract talent from abroad						
Outcomes						
Scholarship recipients help develop Panama's national innovation system					Scholarship recipients return to Panama. Scholarship recipients re-enter institutions of the national innovation system for employment. Cost-benefit ratio of education of scholarship recipients is favorable.	Evaluation report
Intermediate outcomes						
Scholarships awarded	0	3	8	19	37	Program administrative records
Outputs						
Calls for applications	0	1	1	1	3	Idem
Candidates evaluated	0	15	45	50	110	Idem
System for monitoring scholarship recipients		System up and running				Idem
Subcomponent 5: Program to support graduate students pursuing degrees in science and technology at public universities						
Outcomes						

					Scholarship recipients at the Master's level in ICTs have entered the labor market. Cost-benefit ratio of education of scholarship recipients is favorable.	Evaluation report
Intermediate outcomes	Baseline	Year 1	Year 2	Year 3	Target	
Master's program launched		1			1	Program administrative records
Scholarships awarded	0	15	30	30	75	Idem
Outputs						
Call for applicatinos	0	1			1	Idem
University selected	0	1			1	Idem
Candidates evaluated	0	30	50	50	130	Idem

Outcomes Matrix
Component 3

Objective	To mitigate the institutional challenges facing SENACYT. These challenges are the need: (i) to increase and improve its capacity to guide/coordinate actors, institutions, and policies associated with the introduction of new (or improved) projects and/or processes into the market; (ii) to ensure its institutional sustainability; in particular, to maintain continuous flows of benefits, survive as an important and relevant organization, strengthen its ability to comply with foreseeable operational costs, as well as its institutional learning capacity; (iii) increasing its capacity to manage institutional policies and mechanisms (i.e., stimuli) in a proactive manner. Therefore, regular evaluations will be conducted to gauge progress accordingly.			
Outcomes	Baseline	18 months	Year 3 Target	Source of information
1. Orientation and coordination of improved national innovation system	40% of members of CICYT and stakeholders rates the management and achievements of SENACYT as "excellent".	51%	85%	Focus group interviews (CICYT and stakeholders), R&D survey
2. Study grants awarded for strengthening of SNI research institutions.	0 grant recipients	11 grant recipients	7 grant recipients	Institute for Human Resources Training and Development
3. Institutional sustainability of SENACYT	Analysis of financial revenue flows and nonfinancial services (SENACYT Strategic Plan)	ICT strategic plan targets 60% met. 2010-2015 Plan approved by ministerial cabinet.	ICT strategic plan targets 80% met	SENACYT strategic plan (according to Monitoring and Control Unit)
	20% of actors, government agencies, business leaders, universities, and other stakeholders rate SENACYT's work as highly relevant and necessary (beneficiaries and nonbeneficiaries)	65%	90%	Focus group interviews
	Analysis of execution of SENACYT strategic plan (business plan)	Satisfactory financial equilibrium analysis (break even)	Satisfactory financial equilibrium analysis (break even)	Financial equilibrium study
	System for storing and disseminating effective knowledge (on policy, administration, coordination, collaboration, technology-related business opportunities, etc.) up and running.	Documents showing feedback from and through the storage system leads to significant corrective measures.	Documents showing and monitoring feedback and corrective measures describe the process and reaction time for feedback, report information as appropriate and helpful at at least a level 7 (on a scale from 1 to 10).	Focus groups of CICYT, CONACYT and stakeholders (internal and external)
4. Management of institutional policies and mechanisms	Set of policies and action plans contained in the National Strategic Plan for Science, Technology, and Innovation (PENCTI)	At least 3 new policies issued (with their respective action plans), one for each of the three key sectors selected.	Successful implementation of at least two of the three new sector policies.	SENACYT records
Outputs				
1. Development of consultation mechanisms to establish sector-specific needs and to make and modify policies	Documentation of sector-specific commissions on achievements, strengths, and opportunities	At least one think tank established.	Two think tanks established and documented.	SENACYT records
2. Incentives for excellence in R&D provided	None	12	20	SENACYT records
3. Implementation of an improved management and monitoring and control system for PENCTI and the program.	Baseline system (described in the Institutional Capacity Evaluation System by consultant Nelson Hernández) yielded a medium level of monitoring and control capacity and medium fiduciary risk.	New management, monitoring, and control system up and running.	New institutional capacity study yields "high" levels of management capacity and low fiduciary risk.	SENACYT records
4. Operating Regulations for Component 1 revised and improved	SENACYT regulations in place prior to the Bank's program	Revised and implemented regulations allow for clear identification of the innovative value and economic value added.	Revised regulations are incorporated to the electronic database and are easily accessible through the website.	SENACYT records

**MULTIPHASE PROGRAM FOR TECHNOLOGICAL TRANSFORMATION – PHASE I
(PN-0158)**

SUMMARY TABLE OF THE PROCUREMENT PLAN FOR THE FIRST 18 MONTHS WITH METHODS AND TIMETABLES

Reference number	Description of contract and estimated procurement cost	Estimated cost US\$	Procurement method	Source of financing		Prequalification Yes/No	Estimated dates		Status (pending, in process, awarded, canceled)
				IDB	LOCAL		Procurement notice	Contract completion	
	1. Goods								
1	Procurement of educational modules for teaching of the "Hagamos Ciencia" program	312,000	ICB	100%		Yes	3Q 2008	4Q 2010	Pending
2	Procurement of books and textbooks for the "Hagamos Ciencia" program	120,000	NCB		100%	No	3Q 2008	4Q 2010	Pending
3	Procurement of two vehicles for the "Hagamos Ciencia" program	40,000	Shopping	100%		No	3Q 2008	4Q 2008	Pending
4	Procurement of computers for the "Hagamos Ciencia" program	10,800	Shopping	100%		No	3Q 2010	2Q 2010	Pending
5	Provision of equipment and facilities for ACUACULTURA	250,000	ICB	100%		Yes	3Q 2010	2Q 2010	Pending
6	Outfitting of SENACYT management control unit	80,000	NCB		100%	No	3Q 2008	2Q 2008	Pending
	3. Nonconsulting services								
7	Workshops to identify technological restrictions	100,000	NCB	100%		No	3Q 2008	4Q 2010	Pending
8	Training in scientific project management	50,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
9	Training programs for educators (summer)	311,250	ICB	100%		No	3Q 2008	4Q 2010	Pending
10	Organization of workshops in schools	34,222	Shopping		100%	No	3Q 2008	4Q 2010	Pending
11	Training for executives	54,000	NCB	100%		No	3Q 2008	4Q 2010	Pending
12	Continuing education for facilitators	16,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
13	Rental of resource centers	84,000	NCB		100%	No	3Q 2008	4Q 2010	Pending
14	Provincial meetings with coordinators	27,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
15	Strategic planning workshop with international experiences	40,000	Shopping	100%		No	4Q 2008	2Q 2010	Pending
16	Strategic planning workshop	6,000	Shopping	100%		No	3Q 2010	3Q 2010	Pending

Reference number	Description of contract and estimated procurement cost	Estimated cost US\$	Procurement method	Source of financing		Prequalification Yes/No	Estimated dates		Status (pending, in process, awarded, canceled)
				IDB	LOCAL		Procurement notice	Contract completion	
17	Annual project evaluation meeting	24,000	Shopping	100%		No	3Q 2008	4Q 2010	Pending
18	Outcome dissemination workshop	4,000	Shopping	100%		No	3Q 2010	2Q 2010	Pending
19	Advertising on educational radio and television	75,000	NCB	100%		No	3Q 2008	4Q 2010	Pending
20	Organization of meetings with liaisons and psychologists in regions that can collaborate	12,000	Shopping	100%		No	3Q 2008	4Q 2010	Pending
21	Training for Ministry of Education personnel in talent identification	5,000	Shopping	100%		No	3Q 2008	4Q 2010	Pending
22	Visits to gifted youth	30,000	Shopping	100%		No	3Q 2008	4Q 2010	Pending
23	Meetings to designate members of board of directors	6,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
24	Meetings to designate members of Evaluation Committee	9,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
25	Meetings to establish the Technical Secretariat	108,000	NCB	100%		No	3Q 2008	4Q 2010	Pending
26	Events to promote and disseminate work of national innovation system	5,000	Shopping		100%	No	3Q 2008	2Q 2008	Pending
27	Events to promote and disseminate new members	15,000	Shopping	100%		No	3Q 2008	3Q 2010	Pending
28	Promotion and dissemination of the national innovation system	10,000	Shopping		100%	No	4Q 2009	2Q 2010	Pending
29	Promotion and dissemination of active members and new members	15,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
30	Maintenance of scholarship recipient monitoring system	30,000	Shopping	100%		No	3Q 2009	4Q 2010	Pending
31	Announcement of calls for bids	15,000	Shopping		100%	No	3Q 2008	4Q 2010	Pending
32	Forums to present prioritized lists	11,250	Shopping		100%	No	3Q 2008	4Q 2010	Pending
33	Organization of workshops to compile recommendations in "position papers"	20,000	Shopping	100%		No	3Q 2008	1Q 2009	Pending
34	Organization of workshops to submit recommendations to CONCYT, CICYT, and the Board of Directors	1,000	Shopping		100%	No	3Q 2008	1Q 2009	Pending
35	Compilation of recommendations in	20,000	Shopping	100%		No	3Q 2008	2Q 2009	Pending

Reference number	Description of contract and estimated procurement cost	Estimated cost US\$	Procurement method	Source of financing		Prequalification Yes/No	Estimated dates		Status (pending, in process, awarded, canceled)
				IDB	LOCAL		Procurement notice	Contract completion	
36	"position papers" Submittal of summary of results to broad audience	9,000	Shopping	100%		No	3Q 2008	1Q 2009	Pending
37	Training events for strengthening human resources scientific capacity	18,000	Shopping		100%	No	3Q 2008	3Q 2010	Pending
38	Monitoring and evaluation events	35,000	Shopping	70%	30%	No	3Q 2008	4Q 2010	Pending
	4. Consulting services								
	a. Firms					No			
40	Publicity campaign to launch bidding for the innovative project window (businesses or university students)	36,000	NICQ		100%	No	3Q 2008	2Q 2008	Pending
41	Design of evaluation program	125,000	IICQ	100%		No	3Q 2008	4Q 2010	Pending
42	Filming of classes	160,000	NICQ		100%	No	3Q 2008	4Q 2010	Pending
43	Editing of class videos	6,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
44	Evaluation	270,000	ICB	100%		No	3Q 2008	4Q 2010	Pending
45	National talent census	80,000	NICQ	100%		No	3Q 2008	4Q 2008	Pending
46	Evaluation of the talent discovery program	12,000	ICQ	100%		No	3Q 2008	4Q 2010	Pending
47	Design and development of the information system on the inventory of science and technology researchers	100,000	ICQ		100%	No	3Q 2008	2Q 2008	Pending
48	Evaluation of system to encourage science and technology researchers	300,000	ICB	100%		No	3Q 2008	3Q 2010	Pending
49	Design and development of the information system to monitor scholarship recipients	100,000	IICQ	100%		No	3Q 2008	3Q 2008	Pending
50	Gathering and processing of information on indicators	210,000	IICQ	33%	67%	No	3Q 2008	4Q 2010	Pending
51	Review and proposal to adjust the design of SENACYT's management control unit	137,950	IICQ	100%		No	3Q 2008	3Q 2008	Pending

Reference number	Description of contract and estimated procurement cost	Estimated cost US\$	Procurement method	Source of financing		Prequalification Yes/No	Estimated dates		Status (pending, in process, awarded, canceled)
				IDB	LOCAL		Procurement notice	Contract completion	
52	Design of technical assistance manuals and procedures for SENACYT's management control unit	120,000	NICQ	100%		No	1Q 2009	2Q 2009	Pending
53	Midterm program evaluation	40,000	NICQ	63%	38%	No	2Q 2009	2Q 2009	Pending
54	Special evaluation (Phase II triggers)	40,000	NICQ	50%	50%	No	1Q 2009	2Q 2009	Pending
55	Final program evaluation	50,000	NICQ	100%		No	3Q 2010	4Q 2010	Pending
56	Financial audit of program (annual)	60,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
	b. Consultants								Pending
	Design of window for innovative projects	30,000	IICQ		100%	No	3Q 2008	2Q 2008	Pending
57	Evaluation of proposals for innovative-project window	138,000	IICQ		100%	No	3Q 2008	4Q 2010	Pending
58	Identification of initiatives in key sectors	30,000	IICQ		100%	No	3Q 2008	2Q 2008	Pending
59	Assessment of potential for scientific productions in executed projects	40,000	IICQ		100%	No	3Q 2008	4Q 2009	Pending
60	Development of capacity to generate scientific products	100,000	IICQ		100%	No	3Q 2008	4Q 2010	Pending
62	Technical assistance for electronic strengthening of scientific production	100,000	IICQ		100%	No	3Q 2008	4Q 2010	Pending
63	Evaluation and selection of R&D projects	300,000	IICQ		100%	No	3Q 2008	4Q 2010	Pending
64	Evaluation and selection of projects from the Open Program for R&D Infrastructure and Equipment	60,000	IICQ		100%	No	3Q 2008	4Q 2009	Pending
65	Evaluation and selection of projects for the Open Program for International R&D Collaboration	120,000	IICQ		100%	No	3Q 2008	4Q 2010	Pending
66	Executive director of "Hagamos Ciencia" program (*)	144,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
67	Head of special projects for the "Hagamos Ciencia" program (*)	120,000	NICQ	100%		No	3Q 2008	4Q 2009	Pending
68	Administrative assistants for the "Hagamos Ciencia" program (*)	108,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
69	Facilitators of the "Hagamos Ciencia"	432,000	NICQ		100%	No	1Q 2009	2Q 2009	Pending

Reference number	Description of contract and estimated procurement cost	Estimated cost US\$	Procurement method	Source of financing		Prequalification Yes/No	Estimated dates		Status (pending, in process, awarded, canceled)
				IDB	LOCAL		Procurement notice	Contract completion	
70	program (*) Manager of the "Hagamos Ciencia" program (*)	86,400	NICQ		100%	No	3Q 2008	3Q 2010	Pending
71	Educational director	100,800	NICQ		100%	No	3Q 2008	4Q 2010	Pending
72	Design of evaluation program	115,200	NICQ	100%		No	3Q 2008	4Q 2010	Pending
73	Facilitators for class observations	45,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
74	Evaluation specialist	90,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
75	Manager of the talent discovery program (*)	81,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
76	Psychologists for the talent discovery program (*)	162,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
77	Support consultants in the 15 educational regions for implementation of the talent discovery program (*)	675,000	NICQ		100%	No	3Q 2008	4Q 2010	Pending
78	Design and operation of the electronic system for program quality compliance	75,000	NICQ		100%	No	3Q 2008	4Q 2010	Pending
79	Experts to review and evaluate quality compliance	11,250	NICQ		100%	No	3Q 2008	4Q 2010	Pending
80	Development of terms of reference for think tanks on science and technology policies	6,000	NICQ		100%	No	3Q 2008	1Q 2009	Pending
81	Identification and commissioning of international experts from think tanks on science and technology policies	20,000	NICQ	100%		No	3Q 2008	1Q 2009	Pending
82	Identification of issues for analysis for think tanks on science and technology policies	6,000	NICQ		100%	No	3Q 2008	1Q 2009	Pending
83	Identification and commissioning of international experts for think tanks on logistics and transportation	10,000	NICQ	100%		No	3Q 2008	2Q 2009	Pending
84	In-service training for international metrology experts	22,000	NICQ		100%	No	3Q 2008	3Q 2010	Pending
85	Identification of specialized indicators to measure performance	45,000	NICQ	67%	33%	No	3Q 2008	4Q 2010	Pending
86	Analysis and evaluation of information	60,000	IICQ	100%		No	3Q 2008	4Q 2010	Pending

Reference number	Description of contract and estimated procurement cost	Estimated cost US\$	Procurement method	Source of financing		Prequalification Yes/No	Estimated dates		Status (pending, in process, awarded, canceled)
				IDB	LOCAL		Procurement notice	Contract completion	
87	available at SENACYT and science and technology institutions Preparation of basic performance indicator documents	15,000	NICQ		100%	No	3Q 2008	4Q 2010	Pending
88	Design of online information accessing system	12,000	NICQ		100%	No	3Q 2008	2Q 2008	Pending
89	Design and implementation of online indicator system	8,000	NICQ		100%	No	2Q 2009	2Q 2009	Pending
90	Technical assistance to operate SENACYT's management control unit	60,000	NICQ	100%		No	1Q 2010	2Q 2010	Pending
91	Coordinator of SENACYT's management control unit (*)	180,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
92	Technical coordinators of SENACYT's management control unit (*)	504,000	NICQ	100%		No	1Q 2008	4Q 2010	Pending
93	Support personnel for SENACYT's management control unit (*)	216,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
94	Organization and execution of launch workshop	15,000	NICQ			No	3Q 2008	1Q 2008	Pending
95	Innovation support coordinator (Component 1) (*)	72,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
96	Innovation support coordinator (Component 1) (*)	72,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
97	R&D support coordinator (Component 1) (*)	72,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
98	R&D support consultant (Component 1) (*)	72,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
99	Project execution supervisor (*)	72,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
100	Support coordinator for Component 2 (*)	144,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
101	Special projects coordinator for Component 2 (*)	90,000	IICQ	100%		No	3Q 2008	4Q 2010	Pending
102	Procurement support consultants (*)	144,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending
103	Financial management support consultants (*)	144,000	NICQ	100%		No	3Q 2008	4Q 2010	Pending

(*) Long-term consultant