

## SECOND SCIENCE AND TECHNOLOGY PROGRAM

(VE-0112)

### EXECUTIVE SUMMARY

**BORROWER AND  
GUARANTOR:**

Republic of Venezuela

**EXECUTING  
AGENCY:**

Consejo Nacional de Investigaciones Científicas y Tecnológicas  
(CONICIT) [National Science and Technology Research Council]

**AMOUNT AND  
SOURCE OF  
FINANCING:**

IDB:	US\$100 million (OC)
Local counterpart:	<u>US\$100 million</u>
Total:	US\$200 million

**FINANCIAL TERMS  
AND CONDITIONS:**

Amortization period:	20 years
Disbursement period:	4 years
Interest rate:	variable
Inspection and supervision:	1%
Credit fee:	0.75%
Currency:	US\$ from the Single Currency Facility

**OBJECTIVES:**

The general objective of the proposed program is to strengthen the national innovation system. The specific objectives are to: (a) boost the capacity to generate scientific and technological knowledge and help to improve the competitiveness of the country's main production sectors; (b) promote innovation in companies that produce goods and services; (c) foster cooperation between the academic, production, environmental and social sectors for the generation, transfer and use of science and technology; and (d) enhance the capacity for disseminating and popularizing science and technology.

**DESCRIPTION:**

The program is chiefly designed to support actions by CONICIT to help strengthen the national innovation system (NIS) and surmount its main limitations and includes activities to facilitate interaction and cooperation among different stakeholders in the NIS. To that end, the program includes the following components:

Component 1: Financing for research and development projects (US\$40 million). The objective of this component is to strengthen capacity for research and the production of relevant knowledge through nonreimbursable funding for research projects in public and private universities, institutes and research centers.

Component 2: Training for science and technology research (US\$50 million). The objective of this component is to boost national capacity to create and manage knowledge in science and technology (S&T). It will provide funding to train specialists in conducting and managing science and technology research projects, including: (a) grants for postgraduate studies (master's and doctoral level) in Venezuela and abroad; (b) training in S&T management; (c) training that does not lead to a degree; (d) grants for postdoctoral studies; (e) positions in institutions for new researchers; and (f) institutional support to strengthen national postgraduate programs and train researchers in Venezuelan universities.

Component 3: Strengthening R&D centers and technology services (US\$20 million). The program will help to strengthen scientific infrastructure in emerging academic institutions, sector technology centers and the national laboratory system by granting nonreimbursable cofinancing to beneficiary institutions. The support will be nonrenewable and will diminish over time. In all cases, selection will be based on a competitive process using transparent evaluation criteria established in advance. They will include an evaluation of the demand for services, managerial capacity and project sustainability.

Component 4: Promotion of innovation in the production, social and environmental sectors (US\$40 million). The objective of this component is to strengthen the capacity to generate and coordinate demand and transfer of knowledge for innovation in production, social and environmental sectors and in different regions.

The component will include: (a) cofinancing for **innovative projects** to boost business competitiveness, productivity and returns; (b) financing for **technology extension services** for small and medium-sized companies; (c) financing for **social, environmental and production agendas** as a means of bringing different players in a sector together in networks to generate and apply knowledge to help find solutions to the country's problems in that specific sector; and (d) **regional research agendas** to foster science and technology initiatives to solve concrete problems in the country's different regions.

Component 5: Science and technology dissemination and popularization (US\$10 million). All the activities to be financed under this component will be selected through competitive public processes and will include: (a) design of publications and audiovisual products; (b) events to popularize and publicize S&T; (c) design and adaptation of contents, materials and methods, printed and audiovisual information, software to improve science teaching, and pilot projects to apply new techniques for teaching science and mathematics; and (d) support for the publication of scientific journals.

Component 6. Information services (US\$8 million). This component will include: (a) **information projects** which could involve the development of information tools, systems, products and services, to facilitate access, use, interconnection and dissemination of information to the different social stakeholders involved in science and technology development; and (b) **financing and strengthening of networks on specific topics**, i.e. cooperative science and technology information services in subject areas defined by CONICIT in conjunction with the academic network of national research centers and universities (REACCIUN) to facilitate information supply and demand.

Component 7: Institutional strengthening, innovation policy studies and concurrent costs (US\$12 million). This component will finance enhancement of the managerial capacity of CONICIT and other institutions in the national innovation system. The actions include strengthening the Venezuelan intellectual property system, the national systems for metrology, standardization, quality control and certification, and the system of indicators for science and technology activities. It will also include financing to hire specialized consulting services for program follow-up and evaluation and policy and planning studies, and will cover other concurrent costs of the program.

## THE BANK'S COUNTRY AND SECTOR STRATEGY:

The Bank's strategy in Venezuela has the following main objectives: (a) to maintain macroeconomic stability; (b) to reduce inequity and alleviate poverty; and (c) to boost competitiveness and efficiency in the use of the country's resources through private sector development. The proposed program is intended to strengthen the capacity to generate new knowledge, boost productivity and competitiveness and foster innovation in the production and social sectors and is therefore expected to make a significant contribution to achieving the above objectives.

The country paper on Venezuela is nearly ready and will be discussed soon with the new government that took office on February 2, 1999. The loan portfolio review will continue with the government and a new review mission is slated for the second quarter of the year. The present operation is the second stage in a program that has received wide backing in the country and has been ratified by the new authorities. It dovetails with the new government's priorities. It is anticipated that the country paper will be completed in the first half of this year as part of the programming exercise.

CONICIT has been playing a major role in building the Venezuelan NIS, through sustained and growing support for scientific research in relevant areas, training for high-level researchers, promotion of cooperation among the different players in the NIS and innovative activities for finding solutions to concrete problems facing the country, through novel mechanisms such as sector agendas.

This second stage of the program is particularly important in the difficult circumstances in Venezuela at present because it ensures that the science and technology capacity that the country has been building over several decades will be maintained, since it would be very difficult and costly to recoup if it were lost owing to cyclical downturns. Continued support for CONICIT by successive governments betokens the priority that Venezuela attaches to continued efforts to build up its capacity to generate scientific knowledge and promote innovation in the production, social and environmental sectors, in order to spur growth and greater economic diversification.

**SOCIAL AND  
ENVIRONMENTAL  
REVIEW:**

CONICIT promotes research to find solutions to problems in Venezuelan society through the mechanism of research agendas, which will be supported under the proposed operation. Some of the agendas are working on the analysis of major social problems such as health in border areas, education and problems in today's cities. Other social areas will be examined during the program, such as problems related to the labor market, comprehensive protection for children, public security, and other significant issues.

The program will bolster actions already initiated by CONICIT to support research on environmental protection, biodiversity, urban pollution, and clean technologies in innovative projects. Based on CESI/TRG's recommendations, the Operating Regulations for the program include specific criteria to ensure that the subprojects will take steps for suitable environmental management, including waste disposal, particularly the disposal of laboratory waste.

**BENEFITS:**

The program will help to strengthen Venezuela's capacity in science and technology, consolidating the progress made in stage one. It has been designed to promote the quality and relevancy of research projects, the development of specialized human resources for scientific and technological research, linkage between research centers and potential users of the results, and innovation and technological development in the production sectors.

The program will have a positive impact on modernizing higher education since it will support diversification of funding sources for universities and spur internal changes in those institutions to improve the quality and relevance of academic programs. The research activities promoted by CONICIT will enhance the qualifications of a considerable group of university researchers and professors, raising the quality of a good number of academic programs on the undergraduate, graduate and doctoral levels.

Closer coordination among the different players in the national innovation system, particularly closer ties between academe and industry and participation by researchers through the agenda mechanism in solving problems that are linked to the country's development, will also help to make the academic programs of the country's universities more relevant.

The subcomponents for stronger sector technology centers, innovative projects in companies, technology extension services, industrial agendas and institutional strengthening of the intellectual property, metrology and standardization systems will help to modernize the production apparatus and boost its competitiveness.

With regard to the incentives established under the new execution mechanisms, funding for research projects chosen on a competitive basis can help to have several positive impacts, including: (a) diversification of the sources of funding for universities and centers by boosting their income from the sale of research and technology services, thus making them less reliant on direct government transfers; (b) consolidation of a mechanism to assign more funds to the universities and research and technology centers that present the best projects, creating a climate of competition for public funding as an alternative to the tradition of automatic allocation of public funds based on historical considerations, and introducing or strengthening result-based allocations; and (c) the most active and competitive researchers and programs will be rewarded, which will lead to better working conditions and single them out from others that are less committed to change.

By tapping the potential of information technologies and electronic data networks, the program will facilitate access and strengthen and expand technical information systems in different sectors. It will also make a start on actions to improve science teaching in schools and to publicize and popularize science and technology.

Strengthening Venezuela's science and technology capacity is a necessary factor for modern development but it is not the only one. Demand and interest must be aroused in the production sectors if that capacity is to bring the anticipated benefits. Therefore, the program has planned for a series of concurrent actions – such as the industrial agendas and technology extension services – to promote, foster and facilitate linkage between companies, especially smaller operations, and sources of scientific and technological knowledge and information.

**RISKS:**

From an institutional standpoint, the program would have two main risks: (a) delays in implementing the plan to reorganize CONICIT's structure and procedures; and (b) the level of institutional backing for CONICIT.

The first risk is mitigated by the commitment of CONICIT's administration to implementing the changes identified when the proposed operation was being prepared. The program monitoring plan includes indicators to verify whether the planned institutional changes have been made. Venezuela has a critical mass of researchers and institutions that makes the program's activities viable. The new method of decentralized implementation, actions to strengthen CONICIT's line units, and the contracting of specialized external support will ensure that the program is executed satisfactorily within the planned time frame.

With respect to the second risk, the program enjoys wide backing in Venezuela. The new government has reaffirmed the priority of this second stage and has assigned a central role to science and technology as a key in boosting the country's capacity to generate and assimilate knowledge, improve the competitiveness of the production sectors and continue with the process of internationalization and diversification of the economy. CONICIT is recognized for its drawing power and the leadership it shows in getting the main players in the NIS to take concerted action and do their part.

Last, one financial risk that could affect the program is timely contribution of the local counterpart, although the government has been providing the necessary contributions for the first program. In the last seven years CONICIT's real budget has grown substantially, almost quadrupling in real terms between 1991 and 1998. Since 1992, funds for the first program have represented on average close to 15% of CONICIT's operations and over that period the government's contributions have matched or exceeded the required disbursement rate.

**SPECIAL  
CONTRACTUAL  
CONDITIONS:**

Conditions precedent to the first disbursement for the program: The borrower will present evidence to the Bank that:

- a. The plan for the administrative restructuring of CONICIT's Innovative Programs Management Office has been approved (paragraph 3.9).
- b. An agreement has been signed with CONICIT whereby the borrower undertakes to transfer the loan proceeds and local counterpart to CONICIT, and CONICIT undertakes to carry out its obligations as program executing agency (paragraph 3.17).
- c. The new program Operating Regulations have been placed in effect in accordance with the terms and conditions agreed upon with the Bank and the new instructions have been drawn up to guide the

beneficiaries of the subprojects to be funded by the program (paragraph 3.10).

Special conditions precedent to the first disbursement for subcomponents 4(a) and 4(c): The borrower will present evidence to the Bank that CONICIT has established a high-level industrial technology committee, in accordance with the personnel, functional and procedural profiles agreed upon with the Bank, which will be responsible for evaluating, approving and monitoring innovative projects (paragraph 3.8).

Contractual conditions for project execution:

- a. A meeting to launch the program is to be held within three months after the loan is declared eligible for disbursement (paragraph 3.22).
- b. An external advisory and monitoring committee is to be established within six months after the loan contract is signed (paragraph 3.20).
- c. A trust for up to US\$12 million to finance grants is to be established within three months after the commitment period for the loan has expired (paragraph 3.11).
- d. A maintenance plan is to be prepared for program works and equipment (paragraph 3.15).
- e. Retroactive financing and cost recognition are to be arranged (paragraph 3.18).
- f. Regular program follow-up meetings are to be held (paragraph 3.23).
- g. An evaluation of results is to be performed at the end of the program (paragraph 3.25).

**PROCUREMENT:**

International public bidding will be required for goods worth more than US\$350,000 and works costing over US\$3 million.

**POVERTY-  
TARGETING  
CLASSIFICATION:**

The proposed program does not qualify as a poverty- or geographically-targeted investment.

**EXCEPTIONS TO  
BANK POLICY:**

None

## **I. FRAME OF REFERENCE**

### **A. Introduction**

#### **1. Timing and scope of the program**

- 1.1 Venezuela is one of a still small group of Latin American countries that have established a relatively strong tradition of scientific research. Alongside Mexico, Brazil, Argentina and Chile, Venezuela has a larger presence in internationally-recognized scientific publications than other countries in the region. It is also one of the few countries that has developed some capacity of its own to train young researchers at several of its universities and research institutes. The Bank has been supporting the process of strengthening Venezuela's capacity through a first science and technology operation (604/OC-VE) costing a total of US\$94 million, with Bank financing of US\$47 million. Both the Bank and the Venezuelan government consider that the first S&T program has laid the groundwork for a second program to consolidate and build on the progress made so far.
- 1.2 The proposed program will seek to: promote closer linkage among the different players in the national innovation system; support the capacity for innovation, assimilation and use of new technologies in the production sectors; promote efficient management and financing of S&T activities; forge stronger ties between centers that generate knowledge and potential users; foster research on the main social and environmental problems facing the country; and encourage the private sector to play a larger role in S&T activities.
- 1.3 The challenges of globalization require that past efforts to incorporate scientific and technological know-how and promote innovation in the production and social sectors must be continued and stepped up in order to boost competitiveness and foster greater diversification of the Venezuelan economy. The Venezuelan government attaches priority to continuing with measures to: promote the relevance and quality of research and linkage among the different institutions that carry it out; train and incorporate high-level professionals into academic institutions and research centers; and develop a culture of innovation in companies and in the agencies responsible for delivering the country's social and environmental services.
- 1.4 Building capacity in science and technology is a long-term process that requires sustained support. Support is particularly important in situations of economic crisis when a lack of funding could lead to the breakup of research groups with the consequent loss of valuable human resources that are difficult to replace.

#### **2. Macroeconomic context**

- 1.5 Venezuela is involved in a rapid process of social, political and economic change. In recent years, the country has been facing a trying internal and external situation owing to its difficulty in gaining access to international capital markets and, above all, to the sharp drop in world oil prices, since oil is its main export and source of



government revenues. In this context, a growing consensus is arising with regard to the need to diversify production and sources of tax revenue, seeking to reduce the country's traditional vulnerability to sharp swings in the oil industry.

- 1.6 The country has initiated a series of reforms, many with Bank support, in areas related to budget management, tax collection, customs, social security, regulatory structures, and the conduct of fiscal, monetary and exchange policy. Since 1996, it has eliminated controls on the exchange and interest rates, privatized a series of public companies and banks that had been nationalized after the 1994-1995 financial crisis and begun to open up the oil industry.
- 1.7 The new authorities have stressed their commitment to achieving and maintaining macroeconomic stability, strengthening the social safety net and undertaking reforms in the public sector and the budget management system. It is anticipated that establishment of the macroeconomic stabilization fund agreed upon as part of the sector program recently approved by the Bank to support fiscal and public sector reform (VE-0118), together with the introduction of changes in budgetary, monetary, and financial management, will help to improve Venezuela's economic performance and lay the groundwork for sustained growth in the medium and long terms.

## **B. The national innovation system**

### **1. General characteristics**

- 1.8 As has happened in other countries in the region with relatively higher levels of development, in the second half of this century Venezuela has built up basic capacity in science and technology. As a result of this process, today it has a significant nucleus of researchers and specialized institutions in different scientific disciplines with the capacity to train young researchers. It also has an agency – the National Science and Technology Research Council (CONICIT) – whose function is to promote and coordinate S&T activities. Despite the progress made, this potential has not been fully tapped because it has not been sufficiently involved in responding to the demands and needs posed by the country's development.
- 1.9 Following the recommendations of the report evaluating S&T programs financed by the Bank,<sup>1</sup> and the guidelines for the new S&T strategy,<sup>2</sup> when this program was prepared two consulting studies were financed to analyze Venezuela's national innovation system, including national S&T policies, the supply of technology, and the linkage between the country's S&T capacity and the demands of society.

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<sup>1</sup> Inter-American Development Bank, Evaluation Office, *Synthesis Report RE-227: Science and Technology Program Evaluation*, 1998.

<sup>2</sup> Inter-American Development Bank, Social Programs and Sustainable Development Department, *Science and Technology for Development, a Strategy Paper* (document GN-1913-1), December 1998.

- 1.10 The “national innovation system” concept provides a suitable framework for analyzing national S&T policies because it spells out the different types of inputs necessary to promote an innovative economy able to compete in today’s globalized markets. The OECD has defined a national innovation system as “a network of public and private institutions whose activities and actions initiate, import, modify and disseminate new technologies”. Its basic elements – individuals, organizations and policies – can be found in every country. What distinguishes successful national innovation systems from unsuccessful ones is their capacity to promote constructive interaction among the different elements to surmount the weak linkage between institutions that generate knowledge and the local production apparatus, fragmentation and dispersion of efforts, and the frequent imbalances in access to funding. In turn, this capacity arises from the concerted efforts of the players and organizations that make up the system. This is not something that can be created by law or decree. It can be analyzed by looking at the principal functions that form part of effective systems in the industrialized countries.<sup>3</sup> Some of those functions – such as policy formulation, definition of the regulatory framework and public funding – are carried out by national governments, and others – such as financing and implementing innovative activities, developing human resources and basic skills, and providing infrastructure – are shared by the public and private sectors.
- 1.11 In the case of the NIS in Venezuela, the studies concluded that all these functions are present to a greater or lesser extent, although generally not closely linked. Analyses of the system<sup>4</sup> point, in particular, to its lack of articulation and the weak ties among research institutions and between them and society. A description of some aspects of Venezuela’s national innovation system is given below, including an account of the functions performed by government agencies, an analysis of scientific potential, linkage between technology supply and demand, and the institutions that participate in shaping the regulatory framework for innovative activities.

## **2. The government’s functions**

- 1.12 CONICIT was established by law in 1967 as an autonomous institution reporting to the Office of the President and is one of the key institutions in the NIS in Venezuela. Its chief functions include promoting science and technology research and formulating national S&T plans.
- 1.13 The regulatory functions that are relevant for innovation are the responsibility of the executive branch through the Ministry of Industry (intellectual property, standardization, metrology) and the Ministry of Finance (allocation of funds to different national organizations, tax incentives, etc.).

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<sup>3</sup> Mullin Consulting Ltd., “Venezuela’s National System of Innovation: The Context for the CONICIT-IDB II Loan”, Kanata, Ontario, Canada, September 1998.

<sup>4</sup> J. Mullin, op. cit.; Mercado *et al.*, “La Red Desarticulada: Elementos para una aproximación al Sistema Nacional de Innovación en Venezuela”, Caracas, September 1998.

### 3. The potential of the Venezuelan scientific community

- 1.14 Venezuela has outstanding scientific potential among the countries of Latin America which is reflected, for example, in its presence in international scientific publications. In the last forty years, Venezuela has stood out for its significant and ongoing efforts to develop high-level intellectual, academic and investigative capacity by sending large numbers of students to study for master's and doctoral degrees in universities in industrialized countries, creating and developing postgraduate programs in national universities,<sup>5</sup> and promoting science and technology research in universities and other academic institutions. Venezuela has also attracted a considerable number of foreign researchers to local institutions, who account today for about 10% of its scientific community.<sup>6</sup> As a result of these efforts, the country quickly established a solid core of human resources who expanded scientific research in universities and specialized centers. However, recent studies on the human-resource situation in the sector have concluded that despite these major achievements it continues to be necessary to sustain and step up efforts to respond to the challenges of Venezuela's development.
- 1.15 First, there is a shortage of people working in research and innovation. Estimates made by CONICIT suggest that there are approximately 5,800 researchers in the country, or 280 for every one million inhabitants.<sup>7</sup> This ranks Venezuela above many of the countries in the region but below Chile, Argentina, Brazil, Uruguay and Costa Rica and far below the recently-developed Asian countries which have over 1,000 researchers per million inhabitants.<sup>8</sup> In institutions of higher learning, where most of the sector's activities are carried out, just 7% of 40,000 professors engage systematically in research and just one fifth of those institutions conduct organized research programs.<sup>9</sup>
- 1.16 Second, the people who engage in research and innovative activities do not have enough training. Fewer than one third have doctorates, 50% have a master's degree, and the remainder only have undergraduate studies.<sup>10</sup> The country has made

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<sup>5</sup> Since 1970, CONICIT has financed 2,400 students (1,400 abroad and the rest in the country) with 1,250 of them studying for doctorates. Taken from: CONICIT, *"Treinta años del CONICIT en cifras: 1967-1997"*, Caracas, 1998, and data provided by CONICIT.

<sup>6</sup> See Mullin Consulting Ltd., op. cit.

<sup>7</sup> Data from CONICIT, Researcher Training and Development Management Office. Also see, CONICIT, *"Lineamientos de Política para la Creación de Capacidades Humanas para la Investigación y la Innovación"*, Caracas, 1995.

<sup>8</sup> IDB, Social Programs and Sustainable Development Department, 1998.

<sup>9</sup> CONICIT, Researcher Training and Development Management Office.

<sup>10</sup> Mercado *et al.*, op. cit.

sustained and successful efforts in recent years to educate doctoral and postgraduate students in certain academic fields, such as a basic and health sciences, but there are major gaps in disciplines such as engineering, social sciences, and agricultural sciences.

- 1.17 Third, there has been marked growth in the number of postgraduate students studying in Venezuelan universities. The country has 91 doctoral programs and 564 master's programs. Although they are of unequal quality, a significant percentage of these programs is comparable to similar programs elsewhere in the world. A recently-initiated process of accrediting postgraduate programs based on international quality standards has resulted in the accreditation of 34 doctoral programs (37% of the total) and 107 master's programs (20% of the total). Furthermore, almost one third of the remaining postgraduate programs are being evaluated and the rest have been given three years to submit to the accreditation process. This suggests that certain institutions and academic areas have good installed capacity to train part of the new generation of researchers and high-level personnel engaged in innovation. In other cases, although there are postgraduate programs with good development potential, lack of institutional coordination and low levels of cooperation among similar or complementary programs has led to scattered teaching and research resources, which are considerable but not sufficient, and additional efforts are required to achieve greater consolidation of academic programs. In areas where there is no local capacity to train professionals and in areas that require consolidation it is necessary to send a considerable contingent of professionals to foreign universities for training as researchers or for professional development.
- 1.18 Fourth, the traditional mechanisms for retaining researchers at universities and specialized institutions and for attracting new graduates to them have proven to be insufficient in light of the deteriorating economic situation in the country since the 1980s. Novel mechanisms promoted by CONICIT, such as the researcher promotion program, and actions to attract young researchers, while successful, are still very recent and further efforts are required to consolidate them.
- 1.19 Last, there are not enough people with training to manage research, technology development and innovation activities, which affects the public and private sectors alike.<sup>11</sup> As progress is made in developing and interconnecting a national innovation system that is interdisciplinary and interinstitutional and in linking R&D to markets and the production sector, demand for professionals of this kind will increase. The country currently has a shortage of them and it is urgent to train them.
- 1.20 Accordingly, one of the biggest challenges for the sector is to train growing numbers of new researchers and highly skilled professionals to meet the rising needs of the national innovation system.

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<sup>11</sup> See Mullin Consulting Ltd., op. cit.

#### 4. Science and technology supply and demand

- 1.21 Venezuela has a variety of science and technology centers and institutes in the public sector and in universities that cover a broad spectrum of disciplines.<sup>12</sup> However this potential is not used to the full extent because its links with the production sectors and society in general are weak and infrequent, although there are some exceptions such as the Venezuelan Oil Research Institute which has close ties to the oil industry. Optimization of the use of latent R&D capacity is one of the main concerns of the country's science and technology policy.
- 1.22 Demand for technology by large private companies is mainly met by foreign suppliers. However, there is unmet demand for technical assistance by small and medium-sized companies which could largely be satisfied with existing local technical know-how if suitable mechanisms for technology extension were organized to link supply to demand.
- 1.23 Except for the oil sector, the competitiveness of the production sectors is conditioned by their scant innovative capacity. This is mirrored in the statistics on spending on innovation, which suggest that the production sector contributes less than 20% of total spending on R&D in Venezuela. The figure is comparable to other Latin American countries but is much lower than in industrialized countries where the private sector contributes over half the money spent on R&D. Experience shows that the transition to an innovative economy requires both a suitable and stable economic framework and incentives to encourage companies to invest in innovation.<sup>13</sup>

#### 5. The regulatory framework for science and technology activities in Venezuela

- 1.24 Experience in industrialized countries shows that the development of an effective innovation system needs a regulatory framework that promotes innovation. The core elements in such a framework include an effective system of legal protection for innovation and the regulation of standards, weights and measures for domestic and imported products. The situation in Venezuela in these areas is described below.
- 1.25 **Protection of intellectual property.** Intellectual property rights are safeguarded under Decision 344 of the Andean Community (Common Industrial Property Regime) which protects industrial property, inventions, utility models, trademarks, industrial designs and secrets and inventive innovations and under Decision 351

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<sup>12</sup> See Mercado *et al.*, op. cit.

<sup>13</sup> See M. Teubal, "Financiamiento de la Innovación en Economías en Vías de Industrialización: una Política Estructural", Round table on the assimilation and use of technology in companies, IDB, February 1998.

(Common Copyright Regime) which protects artistic, literary and scientific works and software. This legislation of the Andean Community is currently undergoing joint revision in light of the agreements reached under the World Trade Organization. Together with the other countries of the Andean Community, Venezuela is working within the established time frames on the reforms needed to comply with its commitments, which chiefly entail expansion of legal coverage for pharmaceutical products, plant species and biotechnology products.

- 1.26 The Autonomous Intellectual Property Service (SAPI), which reports to the Ministry of Industry, is responsible for applying the legislation in its field. It was created in 1997 through the merger of agencies that previously reported to the Ministries of Justice and Industry. SAPI keeps the registers of trademarks, patents, utility models, industrial designs, and musical, literary and artistic works and computer programs. It is also mandated to provide information on current national and international patents. However Venezuelans are not accustomed to using the databases on patents as sources of technical information. Eighty percent of consultations of SAPI's information services come from professionals who are registering patents and trademarks, while consultations by companies and R&D centers do not account for more than 10%. This contrasts with the situation in industrialized countries, where companies and R&D centers frequently consult intellectual property information for its usefulness in guiding technological innovation. This is partly because SAPI's information systems are not suited to this function and therefore need to be modernized.
- 1.27 **Metrology and standards.** Three institutions are responsible for applying the legislation on standards and metrology, i.e. the Autonomous National Metrology Service (SANAMET), the Autonomous Standardization and Quality Certification Service (SENORCA) and the Standardization and Certification Fund (FONDONORMA). In recent years, decentralization of the activities of these institutions has begun with a view to boosting their efficiency. Many of their functions are already being performed in universities and public and private laboratories.
- 1.28 Founded in 1980, SANAMET reports to the Ministry of Industry. It has its main office in Caracas and has four regional offices. Although it charges for its services, its fees are regulated and do not cover its operating costs. In general, its equipment is old and outdated. Furthermore, many certification activities are being decentralized and are performed by public and private laboratories accredited by SANAMET.
- 1.29 SENORCA, which was recently privatized, is responsible for designing national quality control policies. Its main objective is to establish the quality control mechanisms needed to boost the quality of products and the productivity of private companies. Demand for its services by industry and oil companies has been on the rise in recent years.

- 1.30 FONDONORMA has become a private not-for-profit agency, whose function is to promote standardization to raise the quality and competitiveness of goods and services in the production sector. Although it is called upon to become financially self-sufficient eventually, in the medium term it will still require some government assistance to develop the capacity to become self-sustainable.
- 1.31 In the short and medium terms, joint action by CONICIT, the Ministry of Industry and the private sector will be required to strengthen and coordinate the different institutions that make up the regulatory framework of the NIS.

## **6. Regionalization of the NIS**

- 1.32 To promote technology development in the interior of the country, CONICIT relies on two complementary institutions: Science and Technology Development Foundations (FUNDACITES) and the State Science and Technology Commissions. FUNDACITES are present in the following ten states: Anzoátegui, Aragua, Carabobo, Lara, Falcón, Guayana, Mérida, Sucre, Táchira and Zulia. They have their own legal status and are funded by CONICIT and the state governments. Their objectives are to promote, coordinate and strengthen science and technology activities in cooperation with public and private regional agencies, and to foster participative research to address relevant problems for their region.
- 1.33 The State Science and Technology Commissions are decentralized offices of CONICIT in the other states and are staffed by CONICIT. They use funds from CONICIT and the state governments to support projects of regional interest.
- 1.34 CONICIT cofinances projects promoted by FUNDACITES and the State Commissions through its regional development fund. The state governments and other public and private entities provide counterpart funding. In 1998, CONICIT provided some US\$1.5 million for regional research projects promoted by FUNDACITES and the State Commissions, which received regional counterpart funding of about US\$3.5 million.

## **7. Science and technology information systems**

- 1.35 Since 1995, CONICIT has been compiling and publishing the information required to maintain an up-to-date system of S&T indicators, and in 1996 the service joined the Ibero-American network of science and technology indicators (RICYT), which includes the principal Latin American countries in addition to Spain and Portugal. CONICIT regularly publishes compilations of the main data on S&T activities in Venezuela, including financing, research personnel, publications, patents, research projects and grants. Thus far, however, its work has focused on indicators that can be constructed from official statistics and databases. Preparation of reliable indicators on private sector research activities requires a greater effort to compile data through surveys, such as the ones that CONICIT has conducted quite recently in the manufacturing sector, with support from the Central Statistics and Informatics

Office (OCEI).<sup>14</sup> Reliable indicators on scientific, technological and innovative activities are an important element in successful innovation systems. The operation and maintenance of a system of indicators demands a constant effort to perfect the definition, compilation and reliability of the data. The main problem is to ensure that the different institutions in the NIS use homogeneous criteria in compiling information.

### **C. National science and technology policy**

- 1.36 One of CONICIT's main mandates is to prepare national S&T plans. Since 1995, it has presented three-year plans covering 1995-1997, 1997-1999 and 1999-2001. They define the main lines of CONICIT's activities, with estimated goals for the respective periods that are periodically revised. CONICIT's plans serve as the basis for the S&T policies included in the national plans adopted at the beginning of each presidential mandate.
- 1.37 CONICIT has been the main institution through which the government finances scientific research projects and grants to train researchers. The beneficiaries of its programs have traditionally been concentrated in a few prestigious institutions.<sup>15</sup> Moreover, the scientific community has few links to the rest of society, and the private sector plays only a small part in S&T activities in Venezuela, as in many other Latin American countries.
- 1.38 CONICIT's current policy<sup>16</sup> includes the following objectives: to promote high quality, efficient research that is relevant from the social and economic standpoints; to support technological development in the national production apparatus; to promote cooperation among the players in innovative processes, facilitating the coordination of S&T efforts and capacity; to strengthen S&T capacity on the state level to address regional needs and problems and foster development; to expand the social space for S&T research, working toward national and international cooperation between the producers and users of knowledge and promoting the creation of a suitable institutional and legal framework; and to modernize the institutional management of the NIS.

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<sup>14</sup> OCEI-CONICIT, *Encuesta de Capacidades Tecnológicas e Innovativas de la Industria Manufacturera Venezolana*, Caracas, 1997.

<sup>15</sup> The Central University of Venezuela, Simón Bolívar University, the University of the Andes (Mérida), the University of Zulia and the Venezuelan Scientific Research Institute (IVIC) have historically obtained close to 75% of CONICIT funding for projects and accounted for 70% of the country's scientific production. In recent years, CONICIT has been attempting to involve other universities and S&T production centers and, as a result, the share of these five institutions in its project financing dropped to 63% in 1998.

<sup>16</sup> See CONICIT: Three-Year Plan 1997-1999; Three-Year Plan 1999-2001.



- 1.39 To achieve these objectives, CONICIT has introduced new kinds of actions to foster cooperation among different research institutions and promote linkage between them and society. They include the research agendas, funding for affiliated projects involving several research groups working on similar subjects, joint projects between research centers and companies, support for integrated postgraduate programs, and the strengthening of national laboratories.
- 1.40 The agendas consist of research networks that link key players in the NIS in the search for answers to the needs and problems of Venezuelan society. CONICIT has played a central role in shaping these agendas, which include institutions from civil society, business organizations and groups, government agencies working in the sector, policy makers and researchers. The purpose of the agendas is to identify problems and solutions in a given area. To that end, the participating institutions, including CONICIT, help to finance research projects on relevant topics, chosen through periodic competitions. These other institutions currently make larger contributions than CONICIT does. Agendas are presently being carried out in olefins and plastics, textiles, forest resource management, metal mechanics, cacao, petroleum, health in border states, urban problems, the environment and biodiversity. The subjects for the agendas in industrial sectors were selected on the basis of an extensive study conducted by the firm Monitor, which examined strategies to develop and tap the country's competitive advantages.<sup>17</sup>

#### **D. Results of the first CONICIT-IDB program and lessons learned**

- 1.41 Starting in 1992, a first science and technology operation costing a total of US\$94 million (604/OC-VE) was carried out with Bank financing of US\$47 million. The operation made significant gains including: 113 research projects in five priority areas (biotechnology, information technology, new materials, electronics and fine chemistry); 240 study grants on the doctoral and master's levels in those areas (207 abroad and 33 in Venezuela) which has helped to boost the number of high-level professionals working in R&D; strengthening of national laboratories; renovation and equipment for the Biomedical Research Center of Carabobo University which conducts studies to control endemic parasitic diseases and to create inputs for the pharmaceutical industry and biotechnological applications for agriculture; and the establishment of an academic network of national research centers and universities (REACCIUN) to promote efficient exchanges of information and knowledge among universities and R&D centers.
- 1.42 Implementation of the first program was relatively slow in the early years on account of management problems in CONICIT and in the research institutions and the difficult political and economic situation in the country during the first half of the 1990s.

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Monitor Company, "Construyendo las Ventajas Competitivas de Venezuela: Hacia un Consenso para la Acción", Caracas, June 1998. Monitor is a company headed by Michael Porter which specializes in studies on competitiveness on the international level.

- 1.43 Once the initial problems had been surmounted, implementation became more streamlined. Today, all the funds have been committed and financial execution exceeds 80% of the original budget. Part of the financial costs that were originally to have been covered from the Bank loan are being covered with national funds. The program is expected to be completed by the middle of this year.
- 1.44 The impact and performance of the first program was evaluated by INVERTEC, an international consulting firm with extensive experience in the design and evaluation of similar operations in countries such as Chile, Colombia and Uruguay. The firm studied the execution and impact of the different program components, with the help of specialists in each of the priority areas. The specialists visited a representative sample of the research projects and studied the results.
- 1.45 The evaluation concluded that the program had been quite successful overall.<sup>18</sup> The researcher training component, the results of the R&D projects and development of the REACCIUN network were considered highly satisfactory, as is briefly explained below.
- 1.46 **Research and development projects.** Overall, the evaluation found that the 113 projects funded had good impact in the areas of scientific value, researcher training, and strengthening the S&T infrastructure. Although several of the projects had transferable and patentable results, most of the projects initially designed for "immediate transfer" only produced scientific results. According to the evaluation, transfers of the results were not adequately planned because the program was designed on the basis of a "linear" concept whereby "investigation comes first and transfers second". This comment coincides with the conclusions of the evaluation of S&T programs recently performed by EVO, which shows that the linkage between the generation of knowledge and the demand for technology can only be promoted with tools especially designed for the purpose, such as cofinancing of projects in which potential users participate actively from the outset.
- 1.47 **Training.** One of the objectives of the program was to train new researchers and update the knowledge of researchers working in five academic areas (biotechnology, information technology, new materials, fine chemistry and electronics) by providing grants for master's, doctoral and postdoctoral studies, training courses, and attendance at specialized events.
- 1.48 Two hundred and forty postgraduate grants were funded during the program, of which 77% went for doctoral studies, 8% for master's degrees and 15% for postdoctoral programs. The program also financed 87 short courses and 11 trips to scientific events and seminars.

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<sup>18</sup> M. Weissbluth *et al.*, *Evaluación del Impacto del Programa Nuevas Tecnologías: CONICIT-BID I*, Caracas, August 1998. This document can be consulted in the technical files of SO3.

- 1.49 The outcome of this component is highly satisfactory. Close to 85% of the grant holders have already completed their academic programs and the rest are nearing completion. Out of the 200 people who completed their studies, 165 (83%) are already working for or are about to join R&D institutions in Venezuela, while 35 (17%) of those who reported completing their studies have still not responded to the job offers proposed by CONICIT. Although the percentage of grant holders who have not entered institutions is low, CONICIT is taking steps to strengthen the contractual mechanisms to ensure that the beneficiaries of the new program comply with their commitments.
- 1.50 The first program also helped to boost the number of high-level professionals engaging in R&D in 12 of the country's universities in the five priority areas and made it possible to consolidate research groups and master's and doctoral programs in those areas.
- 1.51 **REACCIUN network.** The network was established as a foundation by CONICIT and 13 Venezuelan academic and research institutions in 1994 and is currently the country's largest research communications network, with over 40 institutions connected. It is one of the most advanced of its kind in Latin America.
- 1.52 One of the main lessons learned from the first S&T program is that, because it was restricted to five areas of advanced technology, its impact was limited to institutions with experience and capacity in those areas. However, this failing was compensated for by the actions that CONICIT carried out simultaneously using its own budget, which cost three times more than the activities financed under the program.
- 1.53 The evaluation also noted that the transfer of research results to the production sector did not meet all the initial expectations. This conclusion was also reached in ex post evaluations of similar projects financed by the Bank in other countries and can chiefly be attributed to the fact that their design underestimated the inevitable difficulties encountered in making concrete transfers of S&T knowledge to end users. The evaluations have suggested that to promote and facilitate the transfer of research results, programs must include mechanisms to ensure that potential users participate from the start in designing R&D projects and contribute to their financing.
- 1.54 Last, administration of the first program was complicated by the procedure for implementation, which included an executing unit that was almost completely independent from the rest of CONICIT's structure, and centralized procurement of specialized equipment. Further, execution of the first stage was delayed owing to excessively detailed and complicated procedures for reviews of spending and supporting documents. This contrasts with other S&T operations financed by the Bank in which programs are administered by line units of the executing agency. Under this system, funds for projects and procurements are transferred directly to the research institutions and there is ex post justification of costs, which permits more streamlined execution and administration of resources.

## **E. Bank experience in science and technology and country strategy**

- 1.55 From the time it was founded, the Bank has recognized the importance of science and technology and has made a significant contribution to boosting capacity in borrowing member countries. Loans for S&T projects, higher education, technical training and agricultural research amount to more than US\$3.8 billion so far.<sup>19</sup>
- 1.56 In 1996, the Bank began a general evaluation of its S&T programs as input for revising its strategy in this field. The evaluation was completed in 1998 and the conclusions are being considered by the Board of Executive Directors.<sup>20</sup> A strategy paper has also been submitted to the Board recently.<sup>21</sup>
- 1.57 EVO's evaluation points out that S&T programs have played an important role in developing S&T capacity in the borrowing member countries. To boost the impact and effectiveness of future operations, the report recommends that their design be based on an analysis of the innovation system, that their scope be broadened to include support for the dissemination and assimilation of technology, that more attention be paid to the linkage between technology supply and demand, and that broad consensus be reached with the stakeholders involved. To improve program execution, the report notes the need to pay special attention to the institutional capacity of the executing agencies and for the Bank to actively monitor programs, including periodic performance reviews during their course. Annex I-1 compares the recommendations of the EVO report with the proposed program and Annex I-2 compares the program with the recommendations of the Bank's new S&T strategy.
- 1.58 Based on the recommendations for the new strategy, the second program will promote technological activities in small and medium-sized private companies through matching grants for innovative projects. Based on the recommendations of both documents, the program includes components to promote the dissemination and assimilation of technologies by companies of this kind and to explicitly foster closer ties between research centers and potential users of the results in the production apparatus and in other sectors of society.
- 1.59 The Bank's country strategy in Venezuela has the following main objectives: (a) to maintain macroeconomic stability; (b) to reduce inequity and alleviate poverty; and (c) to boost competitiveness and efficiency in the use of the country's resources through private sector development. The proposed program is intended to strengthen the capacity to generate new knowledge, boost productivity and

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<sup>19</sup> The Bank has approved loans totalling US\$1.4 billion for S&T programs, US\$1 billion for agricultural research and extension, US\$0.7 billion for technical education and job training, and US\$0.7 billion for university development. See IDB, Social Programs and Sustainable Development Department, op. cit., 1998.

<sup>20</sup> IDB, Evaluation Office, op. cit.

<sup>21</sup> IDB, Social Programs and Sustainable Development Department, op. cit.

competitiveness and foster innovation in the production and social sectors and is therefore expected to make a significant contribution to achieving the above objectives.

- 1.60 The country paper on Venezuela is nearly ready and will be discussed soon with the new government that took office on February 2, 1999. The loan portfolio review will continue with the government and a new review mission is slated for the second quarter of the year. The present operation is the second stage in a program that has received wide backing in the country and has been ratified by the new authorities. It dovetails with the new government's priorities. It is anticipated that the country paper will be completed in the first half of this year as part of the programming exercise.
- 1.61 As mentioned earlier, CONICIT has been playing a major role in building the Venezuelan NIS, through sustained and growing support for scientific research in relevant areas, training for high-level researchers, promotion of cooperation among the different players in the NIS and innovative activities for seeking solutions to concrete problems facing the country through novel mechanisms such as sector agendas.
- 1.62 This second stage of the program is particularly important in the difficult circumstances in Venezuela at present because it ensures that the science and technology capacity that the country has been building over several decades will be maintained, since it would be very difficult and costly to recoup if it were lost owing to cyclical downturns. Continued support for CONICIT by successive governments betokens the priority that Venezuela attaches to continued efforts to build up its capacity to generate scientific knowledge and promote innovation in the production, social and environmental sectors, in order to spur growth and greater economic diversification.

#### **F. Design of the new program**

- 1.63 The new program (CONICIT-IDB II) has been designed to take account of CONICIT's experience in its different lines of action, the results of the evaluation of the first program (CONICIT-IDB I), the conclusions and recommendations of the consultants' reports (evaluation of the results and administrative and financial management of the first program; the analysis of the national innovation system; the analysis of CONICIT's environmental protection activities;<sup>22</sup> participation by women in the country's scientific activities<sup>23</sup>), the policy guidelines approved by CONICIT and the recommendations contained in the EVO and SDS reports.

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<sup>22</sup> Eduardo González, Santiago Clavio and Aníbal Rosales, *La Dimensión Ambiental en las Agendas y Proyectos del CONICIT 1995-1998*, Caracas, August 1998.

<sup>23</sup> Vanessa Cartaya, *La Participación de la Mujer en Actividades de Ciencia y Desarrollo Tecnológico*, Centro de Investigaciones Económicas y Sociales (CIES), Caracas, August 1998.

- 1.64 The program is chiefly designed to support actions by CONICIT to help strengthen the national innovation system and surmount its main limitations and includes activities to facilitate interaction and cooperation among different stakeholders in the NIS. It will promote integrated postgraduate programs to train researchers in fields of interest with the cooperation of different institutions; affiliated projects involving various research groups to address more sizeable or multidisciplinary problems; national R&D laboratories to foster cooperation in the use of larger scientific equipment; private sector technology centers; and the industrial, social and environmental research agendas.
- 1.65 To strengthen national capacity to generate and manage S&T knowledge and overcome the shortage of human resources working on innovation, the program proposes to support training or updating for research through doctoral, master's and postdoctoral programs (abroad and in the country), facilitate the entry of new researchers into different NIS institutions, and boost the quality of postgraduate and doctoral programs to train researchers in national universities.
- 1.66 Parallel to the preparation of this program, CONICIT has been restructuring its administrative and management procedures with support from an international consulting firm with extensive experience in institutions and programs of this kind. The results of the institutional analysis have permitted CONICIT to identify measures to simplify and streamline its internal administration, with a reduction in the number of steps required to process applications for funding under its different lines of action.

## II. THE PROGRAM

### A. Program objectives

- 2.1 The general objective of the proposed program is to strengthen the national innovation system. The specific objectives are to: (a) boost the capacity to generate scientific and technological knowledge and help to improve the competitiveness of the country's main production sectors; (b) promote innovation in companies that produce goods and services; (c) foster cooperation between the academic, production, environmental and social sectors for the generation, transfer and use of science and technology; and (d) enhance the capacity for disseminating and popularizing science and technology.
- 2.2 The program seeks to support the capacity for innovation, assimilation and use of new technologies in the production sectors; promote efficient management and funding for S&T activities; strengthen the ties between centers that generate knowledge and potential users; foster research on the country's main social and environmental problems; and encourage more private sector participation in S&T activities.

### B. Program organization

- 2.3 To attain the objectives, the program will be organized into seven components:
  - a. financing for R&D projects;
  - b. training of specialized human resources;
  - c. strengthening of centers for R&D and technology services;
  - d. promotion of innovation;
  - e. dissemination and popularization of S&T;
  - f. information services; and
  - g. institutional strengthening of CONICIT, specialized studies and other concurrent program costs.
- 2.4 Each of the components, activities to be financed and the scaling used are described below. All of the program activities will be carried out in accordance with the rules established in the Operating Regulations.
  1. **Component 1: Financing for research and development projects (US\$40 million)**
- 2.5 The objective of this component is to strengthen capacity for research and the production of relevant knowledge through nonreimbursable funding for research projects in public and private universities, institutes and research centers.
- 2.6 Based on CONICIT's positive experience in financing projects of this kind, the funds for this component will be allocated through competitive processes. Calls for

proposals will be issued periodically and eligible projects will be selected through peer review by prominent Venezuelan and foreign specialists. The evaluation criteria will include the experience of the proponents, the quality of the proposal and the relevancy of the objectives. To determine this last aspect, an evaluation will be performed of the contribution that the project will make to solving concrete problems in the country or to advancing knowledge in the respective discipline and its impact on training qualified researchers. The competitions for project funding will have quotas to steer researchers toward certain areas of interest. They will be revised by CONICIT from time to time based on current S&T development strategies.

- 2.7 The projects evaluated by external experts in each discipline will be ranked in order of merit by technical committees of specialists in the field. The committees will also be responsible for monitoring and evaluating progress in the projects, with support from the CONICIT's Research and Development Management Office.
- 2.8 The funds granted to each project will be administered by the beneficiaries based on the approved budget, in accordance with the national legislation and rules for procurement stipulated in the loan contract. For projects lasting more than one year, CONICIT will make annual disbursements contingent on its approval of the corresponding technical and administrative reports.
- 2.9 The component will include three lines of nonreimbursable financing for: (a) experienced researchers; (b) new researchers who have recently completed their doctorates; and (c) complex projects that require participation by research groups from different institutions and disciplines.
- 2.10 Experienced researchers (US\$24 million). Researchers with considerable experience and scientific production that points to the impact of their professional activities in an eligible field. Some 200 projects worth about US\$120,000 each will be financed during the program.
- 2.11 New researchers (US\$4 million). Researchers with master's or doctoral degrees who are beginning an independent scientific career. Some 80 projects worth about US\$50,000 each will be financed.
- 2.12 Associative research projects (US\$12 million). This activity is intended to promote the establishment of research groups from different institutions who work in similar or complementary disciplines, with a view to enhancing the capacity to tackle more complex problems. Twenty projects will be financed worth an average of US\$600,000 each.

## **2. Component 2: Training for science and technology research (US\$50 million)**

- 2.13 The objective of this component is to boost national capacity to create and manage knowledge in science and technology. It will provide funding to train specialists in



conducting and managing science and technology research projects, including: (a) grants for postgraduate studies (master's and doctoral level) in Venezuela and abroad; (b) training in S&T management; (c) training that does not lead to a degree; (d) grants for postdoctoral studies; (e) positions in institutions for new researchers; and (f) institutional support to strengthen national postgraduate programs and train researchers in Venezuelan universities.

- 2.14 The grants will take two forms: institutional and free market. The institutional grants will be awarded to candidates sponsored by universities, R&D centers and other institutions involved in R&D activities that have institutional development plans already agreed upon with CONICIT, help to fund the grants, and offer guaranteed positions to the candidates after they have completed their study programs. The grants for master's and doctoral studies abroad may include financing for an additional year in Venezuela after completion of the programs to facilitate reentry into national institutions. All the funds for this component will be awarded through competitive processes to be evaluated by committees of experts in each area.
- 2.15 The beneficiaries of the institutional grants will make a commitment to return to the institution that sponsored them or, if agreed by the institution and CONICIT, to another R&D institution, to work for a period double the time they spent studying. In the case of the free market grants, the beneficiaries must work in R&D sector institutions in the country for a period of time twice as long as that for the CONICIT grant. Except for duly justified reasons, holders of grants who fail to comply with their commitments will be required to repay the grants in full to CONICIT under the terms and conditions established in the program's Operating Regulations.
- 2.16 The grants will continue to be administered directly by CONICIT's Human Resource Management Office, which has considerable experience in this area and is highly efficient.

**a. Grants for postgraduate studies (master's and doctoral levels) in Venezuela and abroad (US\$36.9 million)**

- 2.17 Postgraduate studies will be funded for Venezuelan professionals to train as researchers in one of the priority areas established by CONICIT. Two hundred institutional grants for doctoral studies abroad, 200 for studies in Venezuela, and 300 for master's degrees in the country will be financed. The doctoral programs will be financed for up to four years and the master's programs for up to two years. Extensions will not be financed. At least 10% of the doctoral grants for studies abroad will be "sandwich" training programs in which part of the training will be done in a national institution under inter-institutional agreements. This approach is already being used by CONICIT and has been carried out successfully in other Latin American countries. The number of grants that this component will provide each year corresponds on average to the number that CONICIT is already awarding.

2.18 CONICIT will hold three competitions for grants during the program execution. Applications will be evaluated by its Training Advisory Committee and the recommendations will be submitted to the Board through the Training and Development Management Office. The grants for studies in Venezuela may only be used to study in master's and doctoral programs that have been accredited by the National Council of Universities.

2.19 The items that may be financed in full or in part are: round trip travel, tuition fees, medical insurance for the beneficiaries and their families; monthly allowance (includes a supplement for the spouse and up to three children), minor equipment and materials, textbooks and study materials, thesis expenses, travel costs for field work or thesis presentations at congresses, relocation and return relocation costs.

**b. Grants for training in science and technology management (US\$2.2 million)**

2.20 Twenty-five grants abroad and 20 in the country will be financed for master's studies in S&T management. The candidates will be employees of institutions such as CONICIT, FUNDACITES, CONICIT's state S&T commissions, R&D centers and other agencies involved in activities of this kind. CONICIT will hold three competitions for these grants. According to CONICIT's estimates, this will cover most of the shortage of human resources in this field. The duration of the programs and the grants and items to be financed will be identical to the previous subcomponent.

**c. Training not leading to a degree (US\$400,000)**

2.21 A total of 25 grants lasting a maximum of six months will be awarded to people with postgraduate degrees for activities that do not lead to a degree, such as: short research traineeships, attendance at training courses, seminars and postgraduate workshops to bolster skills and performance in scientific and/or technological research. The candidates will be presented by institutions offering support for the programs to train research personnel.

**d. Grants for postdoctoral research (US\$3 million)**

2.22 Public competitions will be held for 110 postdoctoral grants from CONICIT (50 abroad and 60 in the country) to finance research at prestigious academic institutions for a maximum of one year for young Venezuelans who have completed their doctoral studies. The grants are intended to enable the holders to acquire cutting-edge high-level knowledge and skills. It is hoped they will promote joint research projects between Venezuelans and their counterparts in prominent institutions that could give rise to more permanent cooperation. For research abroad, the candidates must be working in a Venezuelan institution that performs R&D and be proposed by it.

**e. Positions for new researchers (US\$1.3 million)**

- 2.23 The main purpose of this activity is to facilitate the entry of 40 young Venezuelans with postgraduate training obtained in Venezuela or abroad into universities or R&D centers in the country. It is also intended boost university teaching capacity and to promote S&T research by attracting highly-skilled researchers to strengthen active and/or priority lines of research and build up existing or new groups of researchers. The candidates must be presented by institutions that have institutional development plans agreed upon with CONICIT.
- 2.24 The support will last for two years and provide a maximum of US\$34,000 equivalent over that period. During the first year, it will pay for the equivalent of 75% of the salary of a professor or researcher in the pertinent category and in the second it will finance 50% of the salary. The sponsoring institutions will undertake to employ the researcher fully when CONICIT's support ends.

**f. Institutional support for national postgraduate programs (US\$6.2 million)**

- 2.25 Integrated postgraduate programs (US\$4.8 million). CONICIT will support the functional integration of postgraduate programs in 12 fields of knowledge in order to further their activities and make more rational and effective use of their human and material capacity. The programs must be accredited by the National Council of Universities.
- 2.26 The proposals for participating postgraduates presented to CONICIT in each of the annual competitions will include a four-year development plan describing common activities to be engaged in by all the participating institutions, including professor/researcher and student exchanges, sharing infrastructure, establishing information networks and holding common events.
- 2.27 The following items are eligible for financing: short-term contracts for experienced senior professors/researchers (national or foreign) to carry out activities to benefit several postgraduate programs at once; travel allowances and expenses for professors/researchers and students to visit the other partner institutions; purchase of specialized books to round out the holdings of affiliated postgraduate programs; technical support and software for the information networks; laboratory costs relating to the thesis work of visiting students; expenses for organizing meetings; and special courses planned by the different programs. Two competitions will be held each year. The average value of the grants will be US\$400,000 per postgraduate program and they will not be renewable.
- 2.28 CONICIT chairs (US\$1.4 million). The purpose of these chairs is to create a structured space for reflection on subjects of interest to certain disciplines in socially relevant areas, contributing to their consolidation. It is hoped that the creation of chairs associated with one or more postgraduate programs will attract national and foreign professors/researchers with outstanding scientific careers and lead to a series

of academic activities (seminars, workshops and short courses) to advance the state of the art in given areas, introduce study topics, and promote research on those topics by postgraduate program professors and students. The CONICIT chairs will also serve as a mechanism for recognizing the academic and scientific merits of people who have made significant contributions to the development of some field of science or technology.

- 2.29 CONICIT will hold four competitions a year to establish 20 chairs and will cofinance the following items: expenses and travel relating to the chair's activities; travel for foreign chairs from their country to Venezuela and back; and salaries for limited periods. CONICIT's maximum annual contribution per chair will be US\$46,000 and the financing may last for up to two years.

**3. Component 3: Strengthening R&D centers and technology services (US\$20 million)**

- 2.30 The program will help to strengthen scientific infrastructure in emerging academic institutions, sector technology centers and the national laboratory system by granting nonreimbursable cofinancing to beneficiary institutions. The support will be nonrenewable and will diminish over time. In all cases, selection will be based on a competitive process using transparent evaluation criteria established in advance. They will include an evaluation of the demand for services, managerial capacity and project sustainability. The component will cover the following three types of institutions.

**a. Strengthening for scientific infrastructure in emerging academic institutions (US\$8 million)**

- 2.31 The objective of this subcomponent is to bolster the research capacity of institutions in the country's interior that have not been traditional beneficiaries of CONICIT but which could undertake and maintain higher levels of research in the short and medium terms.
- 2.32 Institutions that have not had access to more than 5% of total funding granted by CONICIT's Research and Development Support Management Office in the last seven years will be eligible.
- 2.33 Candidates, actively encouraged by CONICIT from among institutions whose staff has presented low demand for different programs promoted and financed by the Council, will be required to prepare a work plan, under CONICIT's guidance, giving a detailed description of the work strategy proposed for the next four years, including: (a) objectives of the plan; (b) research areas to be consolidated; (c) research proposal; (d) requirements for achieving the proposed objectives and justification; (e) planning of activities to train or update researchers; and (f) timetable showing the stages of the strategy plan and the budget for each stage.

- 2.34 Four competitions will be held during the program. The maximum length of a grant will be four years and CONICIT's maximum total cofinancing will be US\$500,000 per project, with the beneficiary contributing at least 10%.
- 2.35 The costs of hiring technical staff, purchasing scientific equipment for laboratories, refurbishing or repairing equipment, procuring equipment to support interconnection (computers and Internet costs) and provide access to scientific information, infrastructure to upgrade and remodel laboratories, specialized consulting services, workshops or advisory services on the formulation and management of research projects, dissemination of research activities and publication of scientific articles will be eligible for financing.

**b. Strengthening of sector technology centers (US\$4 million)**

- 2.36 The program will support private centers sponsored by groups of companies or business associations in a given production sector. The centers will serve the companies' needs for technical support, with special emphasis on small and medium-sized businesses. Projects will be financed to strengthen and increase the services supplied by new R&D centers whose management and funding are mostly provided by the private sector. CONICIT will contribute nonreimbursable cofinancing of up to 50% of the total cost of the projects to be developed by the centers. The costs to be covered include equipment, consulting services and specialized studies.
- 2.37 Proposals will be presented at annual competitions held by CONICIT and will be selected on the basis of the sustainability and managerial capacity of the center to be strengthened, and the projects will be evaluated on the basis of relevance, feasibility, timeliness and performance.

**c. Strengthening of the national laboratory system (US\$8 million)**

- 2.38 The program will support laboratories whose skilled staff perform specialized S&T tests required by academic institutions and the private sector. This line will chiefly support the procurement of specialized scientific or technological equipment for laboratories whose good managerial capacity ensures that the new equipment will be suitably operated and maintained.
- 2.39 Another objective is to promote financing and other support to enable one or more laboratories or R&D groups to establish the human and material capacity to house, maintain and develop heavily-used equipment, techniques and facilities intended to provide services and technical and scientific advice for the universe of specialists requiring such services.
- 2.40 Four competitions will be held during the program to select projects for financing. The evaluation criteria for selecting the proposals will be based on the demand for the services offered by the laboratory, the suitability of its staff, and its management and self-financing capacity. Items eligible for financing will include maintenance and upgrading of specialized instruments, purchases of new equipment, contracting

and training of personnel, and minor civil works to adapt existing buildings. Recurrent costs will not be financed beyond the end of the projects.

- 2.41 National laboratories are defined as organizations whose main purpose is to provide high-level and reliable specialized technical/teaching services, apart from any scientific or technological R&D activities they engage in. They may be organized in one or the other of the following two ways.
- 2.42 One or more installations (laboratories, centers or other R&D units) located in a given institution with their own equipment and technical staff to provide a specialized service required by interested professionals.
- 2.43 An association or network of independent laboratories which, in combination, possess the characteristics described in the preceding paragraph, located in different institutions but linked by joint planning, management and operations.
- 2.44 Cofinancing will be up to 80% of the total cost of a project, for a maximum of US\$800,000. The maximum length of a project will be four years and the grant will not cover recurrent costs beyond that time.

#### **4. Component 4: Promotion of innovation in the production, social and environmental sectors (US\$40 million)**

- 2.45 The objective of this component is to strengthen capacity and broaden the field for generating and coordinating demand for and transfer of knowledge for innovation in production, social and environmental sectors and in different regions.
- 2.46 It will include the following subcomponents.

##### **a. Innovative projects in companies (US\$6 million)**

- 2.47 The program will provide technical assistance and matching grants for innovative projects presented by companies to develop or improve products and processes, including the adoption of clean technologies. At least 80% of the resources for this subcomponent will go to small and medium-sized companies.
- 2.48 This type of financing has been tested in some of the most successful programs for supporting innovation in companies, such as FONTEC in Chile (627/OC-CH). Evaluations of programs that used credit mechanisms for financing R&D in companies indicate that this approach is difficult to execute and leads to less innovative projects than when matching grants are used. Therefore the Bank's new science and technology strategy recommends the latter approach for innovative projects in companies as an option to be included in its future S&T programs.
- 2.49 Innovative projects intended to boost business competitiveness, productivity and earnings will be financed. They will involve R&D of new products and/or processes to satisfy market needs and opportunities and to improve existing products and/or processes. The projects to be financed can include actions to strengthen the

technological capacity of a company to generate and use innovations by establishing innovation groups, units or R&D centers and developing the infrastructure required for those activities and for quality assurance. Funding will also be provided for information services and technologies to organize, develop and/or use communications networks to support innovative processes, and to gain access to, track and/or disseminate knowledge in areas of interest for entrepreneurs. Investments in capital goods (industrial scale), civil works, land or vehicles will not be financed.

- 2.50 Projects will be cofinanced by CONICIT and the company. The Council will provide matching grants for up to 50% of the total cost of a project. When a project is carried out in association with a university or R&D center, CONICIT will finance up to 50% of the work to be done by the company and 80% of the work to be done by the R&D center.
- 2.51 Project proposals will be evaluated by a high-level technical committee on the basis of innovative merit and technical, financial and economic feasibility. The situation of the companies proposing projects will also be examined to ensure their financial viability.

**b. Financing for technology extension services (US\$6 million)**

- 2.52 The program will finance consulting services to promote training, upgrading and the use of consultants and specialists to support technological development in small and medium-sized companies, their adoption of modern and clean technologies, and access to sources of information and know-how in the country and abroad.
- 2.53 The types of projects to be financed include: (a) improvement in the conditions under which technology extension services are offered to the production sector; (b) adoption of new practices to support technology development in the production sector; (c) projects to train or update consultants and specialists to enable them to support the technological development of the production sector and may include positions for them in activities of this kind; and (d) subsidies for hiring consultants in technology management and project formulation.
- 2.54 Universities, R&D centers, companies, businesses, associations, foundations and other institutions linked to business may apply for financing under the subprogram. The program will finance up to 60% of the total cost of these activities.

**c. Social and environmental agendas (US\$12 million) and production agendas (US\$8 million)**

- 2.55 The agendas are cooperative mechanisms that bring different players in a sector together in networks to generate and apply knowledge to help find solutions to the country's problems in that specific sector.

- 2.56 The agendas are established through collective initiatives of players in a sector or an industrial chain. In all cases, once an initiative is suggested, meetings are held to consult and agree on forming an association (with the participation of entrepreneurs, academics, consultants, public institutions and civil society) and to identify an agenda pertaining to problems, needs and opportunities. After the consultation process, potential areas for research and possible project profiles are identified. Formal organization of the agenda is the responsibility of an interinstitutional committee. The members involved in the agenda help to keep it operating and to finance research projects.
- 2.57 CONICIT will help to finance the agendas in which it participates. The funds will be used to partially cover the costs of organizing and operating the agendas and to finance projects in priority areas.
- 2.58 Projects will be selected for financing based on an evaluation of the proposals presented to public competitions that include areas and research topics identified for each agenda.
- 2.59 The projects will be evaluated by CONICIT's technical committees, with participation by independent experts in each area and will be cofinanced up to the following percentages: (a) 50% for projects presented by individual companies; (b) 60% for associative projects presented by more than three companies or projects presented by a single company which have mechanisms to enable the benefits to be used by other companies or institutions; (c) 70% of projects presented for social or environmental agendas.

**d. Regional research agendas (US\$8 million)**

- 2.60 The purpose of this subcomponent is to foster S&T initiatives to solve concrete problems in different parts of the country, promoting the leadership capacity of the Science and Technology Development Foundations and the State Science and Technology Commissions, in alliance with other players (state governments, universities, nongovernmental organizations). Programs presented and coordinated by the foundations or commissions will be selected on a competitive basis.
- 2.61 Cofinancing for the programs will range from 50% to 70% of the total, depending on the relative level of development of the state agencies proposing them. The programs will be evaluated by a technical committee in two stages: preliminary evaluation of project profiles and final evaluation of the preselected profiles. The selection criteria will be based on the nature of the problem, institutional management and leadership, financial feasibility, and personnel qualifications.

**5. Component 5: Science and technology dissemination and popularization (US\$10 million)**

- 2.62 All the activities to be financed under this component will be selected through competitive public processes and will include:



- a. **Design of publications and audiovisual products** (US\$2 million). Design of printed and audiovisual materials to enhance the public's perception and appreciation of science and technology and to promote interest in S&T research among teenagers and children. The program will fund the design of journals, books and pamphlets, press campaigns, short pilot videos and radio and television spots.
- b. **Events to popularize and publicize S&T** (US\$2 million). Projects to prepare events such as exhibitions, congresses, meetings, courses, conferences, and S&T fairs will be financed.
- c. **Design and adaptation of contents, materials and methods, printed and audiovisual information and software to improve science teaching** (US\$2 million). The purpose is to support the design and adaptation of methodologies, contents, materials and methods, printed and audiovisual information and software to improve S&T teaching in primary and secondary schools. Eligible projects will include: design of scientific books, journals and pamphlets, educational games, course contents and teaching methods, audiovisual materials and methods, and pilot projects to apply the new teaching techniques for science and mathematics.
- d. **Support for the publication of scientific journals** (US\$4 million). This activity will promote high-quality juried national scientific journals that appear regularly and print original, unpublished research results.

**6. Component 6: Information services (US\$8 million)**

2.63 This component will finance information projects and help to build information networks on specific subjects.

- a. **Information projects** (US\$6 million). The development of information tools, systems, products and services to facilitate access, use, interconnection and dissemination of information to the different social players involved in the process of S&T development will be financed. Projects with the following objectives will be eligible: (i) to create information through systems, services or products that will become strategic resources for development; (ii) to facilitate access to, interconnection with or the dissemination of information to players in the development process; and (iii) to cover information, communications and cooperation requirements stemming from CONICIT's programs. The full cost of projects intended to cover strategy lines defined by CONICIT and up to 70% of the cost of other projects may be financed. Applications will be presented to periodic competitions held by CONICIT and the projects will be selected on their merits.
- b. **Financing and strengthening of networks on specific subjects** (US\$2 million). The purpose of this activity is to create and maintain

cooperative S&T information services in subject areas defined by CONICIT in conjunction with REACCIUN to facilitate information supply and demand. Projects to create or strengthen specific information systems, services and products for associative projects will be financed.

**7. Component 7: Institutional strengthening, innovation policy studies and concurrent costs (US\$12 million)**

- 2.64 This component will finance enhancement of the managerial capacity of CONICIT and other institutions in the national innovation system. The actions include strengthening the Venezuelan intellectual property system, the national systems for metrology, standardization, quality control and certification, and the system of indicators for science and technology activities. It will also include financing to hire specialized consulting services for program follow-up and evaluation and policy and planning studies, and will cover other concurrent costs of the program.

**C. Scaling of the program**

- 2.65 In the last seven years, CONICIT's budget has increased considerably, almost quadrupling in real terms since 1991. From 1992 to 1998, it averaged US\$75 million a year (expressed in constant 1998 dollars) and has risen to about US\$95 million in the last two years. In the period 1992-1998, the funds for the first program with the IDB, whose investments were targeted to research projects in "new technology" and to training human resources in those areas, accounted for close to 15% of CONICIT's total operations. It is expected that the second stage, unlike the first, will cover the entire range of CONICIT's activities. The new program (including the local counterpart) accounts for 40% to 50% of the activities financed by the Council.
- 2.66 The scaling of the proposed activities, which are mainly programs that CONICIT has been carrying out regularly, was based on information obtained from an analysis of their historical development. Average unit cost structures, relatively stable demand, and proven executing capacity by CONICIT for some of the components and subcomponents (financing for R&D in academic institutions, training for specialized human resources, social, environmental and regional agendas, strengthening of national laboratories, dissemination and popularization of S&T and information services) were taken into account.
- 2.67 For example, while it is proposed to finance a total of 300 research projects for US\$40 million under component 1 (financing for R&D projects), in the last four years CONICIT has financed an average of 70 projects a year (including those in the first program) for the equivalent of close to US\$14 million a year (US\$56 million for the period). Under the new program, 50 doctoral grants abroad will be funded each year for a total of US\$6.25 million a year (US\$25 million for the period) and 50 doctorates and 80 master's degrees a year in Venezuela for about US\$3 million, which is similar in number and amount to the annual grants that CONICIT has approved in recent years.

- 2.68 In the case of components and subcomponents that are new or where experience in implementing them is less extensive (mainly projects for innovation in companies, production agendas and sector technology development centers), CONICIT has presented representative samples of projects in the pipeline or recently-approved projects equivalent to at least 30% of the size of the respective component in the new program. These activities, which will be executed on a pilot scale (US\$6 million for innovation projects in companies, US\$8 million for production agenda projects and US\$4 million for the sector technology centers), were analyzed and evaluated applying criteria for eligibility, innovative merit and financial and institutional sustainability that are substantially similar to those established in the Operating Regulations. An international consulting firm performed an analysis of the capacity of CONICIT's executing unit (the Innovative Programs Management Office) and, as a result, specific recommendations that are described in chapter III were made to ensure good execution of these lines of financing.
- 2.69 Considering the above, the scaling of this operation is adequate with respect to anticipated demand for the different activities and CONICIT's financial and institutional capacity to execute each of the program's components within the planned time frames.
- 2.70 Annex II-2 gives a breakdown of the scaling for each of the program's components and activities. The total cost of the program is an estimated US\$200 million, with Bank financing accounting for 50%. The costs and sources of financing are presented in table II-1.

**Table II-1**  
**Program costs**  
**(US\$ million)**

	<b>IDB</b>	<b>Local contribution</b>	<b>Total cost</b>	<b>% of total cost</b>
1. <b>Administration</b>	1	1	2	1%
2. <b>Direct costs</b>	87.5	80.5	168	84%
2.1 Financing for R&D projects	22	18	40	20%
2.2 Training	25	25	50	25%
2.3 Strengthening of R&D centers and technology services	11.5	8.5	20	10%
2.4 Development of innovation in the production, social and environmental sectors	20	20	40	20%
2.5 Information services	4	4	8	4%
2.6 Dissemination and popularization	5	5	10	5%
3. <b>Institutional strengthening, innovation policy studies and concurrent costs</b>	8.5	3.5	12	6%
3.1 Strengthening of the intellectual property system	1.5	0	1.5	1%
3.2 Strengthening of the technical standards system	0.5	0	0.5	0%
3.3 Strengthening of the metrology system	2	0	2	1%
3.4 Special studies	1	1	2	1%
3.5 System of indicators	1	0	1	1%
3.6 Consulting services and institutional support for CONICIT	2.5	2.5	5	2%
<b>Subtotal</b>	<b>97</b>	<b>85</b>	<b>182</b>	<b>91%</b>
4. <b>Contingencies</b>	2	0.3	2.3	1%
5. <b>Financial costs</b>	1	14.7	15.7	8%
5.1 Interest	0	13.2	13.2	6%
5.2 Credit fee	0	1.5	1.5	1%
5.3 FIV	1	0	1	1%
<b>Total</b>	<b>100</b>	<b>100</b>	<b>200</b>	<b>100%</b>
<b>By source of funds</b>	<b>50%</b>	<b>50%</b>	<b>100%</b>	

## 1. Bank financing

- 2.71 Bank financing for US\$100 million will come from the ordinary capital resources. The terms and conditions of the loan will be:

**Table II-2**  
**Terms and conditions of the loan**

Source of funds:	Ordinary capital (in US\$ from the Single Currency Facility)
Amount:	US\$100 million
Periods:	
Amortization:	20 years
Grace:	4 years
Commitment <sup>a</sup> :	3.5 years
Disbursement:	4 years
Interest rate:	Variable
Credit fee:	0.75% on the undisbursed balance
Inspection and supervision:	1%

<sup>a</sup> The funds will be considered committed when agreements are signed with the beneficiaries of the subprojects.

## **2. Local contribution**

- 2.72 The borrower will provide US\$100 million for the program as the local counterpart, distributed over the four years of execution, with an annual maximum of about US\$29 million in year four. CONICIT's operating budget has been growing by about 6% a year in the last three years and was around US\$97 million in 1998. This level is expected to be maintained. Since the annual counterpart is manageable considering CONICIT's annual budgets, no problems are anticipated from the standpoint of the borrower's capacity to cover the contributions.

### III. INSTITUTIONAL FRAMEWORK AND PROGRAM EXECUTION

#### A. Institutional framework

##### 1. Borrower and executing agency

- 3.1 The borrower will be the Republic of Venezuela and the National Science and Technology Research Council (CONICIT) will be the executing agency. CONICIT was established in 1967 as an independent institution reporting to the Office of the President. Its chief function is to promote science and technology and advise the government in this field.

##### 2. Background on the Execution IDB-financed programs

- 3.2 CONICIT was executing agency of the first program with the Bank costing a total of US\$94 million, with IDB financing of US\$47 million. The loan contract was signed in June 1992 for an initial period of four years. The program began with local funds in that same year, but the first disbursement of the Bank loan was not authorized until June 1993. The program was extended to July 1999, when the final disbursement will be made.
- 3.3 The consulting firm INVERTEC, which analyzed execution of the first program and CONICIT's organizational structure, found that it has adequate internal capacity to execute the new program. However, areas whose restructuring would facilitate timely execution of the second program have been identified. A plan of action was prepared to introduce a series of administrative and organizational reforms to facilitate administration of the new program.

#### B. Program execution

##### 1. Responsibility for execution

- 3.4 CONICIT is organized into four management offices, i.e. administration, policy, research and development support, and innovation programs (see the organization chart in Annex III-1).
- 3.5 The research and innovation management offices are the units that operate the program's lines and will be responsible for most of the planned activities. The communications and dissemination office in the policy management office is the line unit responsible for dissemination and popularization of science and technology.
- 3.6 Unlike the administrative plan for the previous program where a coordinating unit (CU) in CONICIT performed all the administrative functions in an isolated fashion, the present program will be managed under the Council's functional administrative structure through the different line and administrative offices, which will be supported by committees of experts and consultants in specialized areas. Under the

new plan, the functions of the CU will be limited to coordination and liaison with the Bank. Budgeting and budget performance will be assigned directly to the offices that bear technical responsibility for each component. Procurement will be the direct responsibility of the program beneficiaries, based on the rules established by the Bank and the government. The smaller role to be played by the CU in the new program calls for a reduction in its size. During the first program it had a staff of 12, including nine professionals/technicians and three support staff. For the present program it will have a coordinator, four professionals, and two support staff and will report to CONICIT's vice-president.

## 2. Restructuring and strengthening of CONICIT

- 3.7 The analysis of the way in which CONICIT is organized concluded that it has the basic operating and supervisory capacity to carry out the program adequately. However, with a view to strengthening the Council for program execution and for its regular activities, changes will be introduced in its structure and administrative procedures during the proposed operation.
- 3.8 The main changes will take place in the innovation programs management office (GGI), which will be reorganized into three sections: private-sector project development, public-sector and academic project development, and promotion and studies. The restructuring of the GGI will include establishment of a high-level industrial technology committee which will be responsible for evaluating, approving, and monitoring the innovation projects. As a **special condition precedent to the first disbursement** of lines 4(a) and 4(c) of component 4 (innovation promotion), the borrower will present evidence to the Bank that CONICIT has established the high-level committee, with the staff, functional and procedural profiles agreed upon in advance with the Bank. The new structure will also include a project administration unit which will be responsible for administrative control of the innovation projects. Identification, preparation and supervision of the projects carried out by the GGI will be the responsibility of project managers who will be in charge of them during the entire execution period.
- 3.9 Last, administrative processes will be simplified, which will boost administrative efficiency by about 60% (measured in terms of the reduction in the number of steps required to approve subprojects). Legal contracts will be standardized, information systems will be optimized, and a study will be conducted during the first year of the program to streamline CONICIT's staff in the context of administrative simplification. Approval of the administrative restructuring plan for the GGI will be a **condition precedent to the first disbursement** of the program.

## 3. Execution plan and period

- 3.10 The program will be executed over four years, chiefly by CONICIT's line units. The projects financed by the program will be carried out in a decentralized fashion. The beneficiaries will be responsible for procuring goods and services for their projects. Administrative support units will be established or strengthened in the universities

and other beneficiary academic institutions and instructions will be issued containing a detailed description of procurement, monitoring and accounting procedures, based on national standards and Bank procedures. The adoption by CONICIT of the Operating Regulations and the new instructions for the presentation, evaluation and administrative and financial monitoring of the subprojects will be a **condition precedent to the first disbursement**. CONICIT will have high-level staff and/or external advisors for the technical, administrative and financial monitoring of all the projects to be financed under the different lines of the program.

- 3.11 **Execution in years five to seven.** Within three months after the commitment term for program funds has expired, CONICIT will establish a trust of up to US\$12 million to finance grants that began during the program but which, since they will last for several years, will end after the final disbursement of the Bank loan in year four.

#### **4. Flow of funds**

- 3.12 Funds for the program from the loan and the counterpart will be allocated annually in accordance with the execution plan. The counterpart funds will be managed in an account opened by CONICIT in the program's name in a commercial bank. The proceeds from the Bank loan will be managed in a special account in the Central Bank of Venezuela.

#### **C. Contracting of works and procurement of goods and services**

- 3.13 The program does not provide for the construction of civil works or new buildings. Some projects may include small expansions or renovations of existing buildings, which will not cost more in any case than 30% of the total cost of the project, with a cap of US\$250,000 equivalent, and therefore no international public bids will be required, since none of the works will cost more than US\$3 million. Procurements of goods over US\$350,000 equivalent will be made in accordance with the bidding procedures contained in Annex B of the loan contract. Since they will be made by the project beneficiaries, the beneficiaries will be required to send accounts of their expenditures to CONICIT periodically. Ex post reviews will be performed of procurement procedures and supporting documents on the basis of national legislation and Bank standards. Consulting services will be contracted in accordance with the procedures contained in Annex C of the loan contract. The tentative procurement program is presented in Annex III-2.
- 3.14 For beneficiaries in the private sector (institutions in which the government owns less than 50% of the capital), the Bank's procurement policies for that sector will apply, particularly those relating to the appropriate, efficient and economical use of funds and eligible goods, works and services. Competitive procedures will be followed to ensure that goods and services are acquired at market prices.



#### **D. Maintenance of works and equipment**

- 3.15 The borrower, through the executing agency, undertakes to include a commitment in the funding agreements with the beneficiaries that they will operate and maintain the works and equipment financed under the program up to generally-accepted technical standards and that resources will be available to keep them operating efficiently. During program execution, CONICIT will submit reports to the Bank on maintenance of equipment and works procured directly by CONICIT and by the beneficiaries of component 3 (strengthening of the R&D centers and technology services) the previous year and the annual maintenance plan for these works and equipment for the current year.

#### **E. Disbursement schedule**

- 3.16 Based on the program for execution, the tentative timetable for disbursements of the loan and the counterpart is given below.

**Table III-1**  
**Annual program disbursements by source**  
**(US\$ million equivalent)**

Source	Year 1	Year 2	Year 3	Year 4	Total
IDB	20.2	26.4	26.3	27.0	100
Counterpart	18.4	25.7	27.0	28.9	100
Total	38.6	52.1	53.4	55.9	200
% per year	19%	26%	27%	28%	100%

- 3.17 The borrower will present evidence to the Bank's satisfaction **prior to the first disbursement** that it has signed an agreement with CONICIT under which the borrower agrees to transfer the loan and local counterpart funds to CONICIT and CONICIT agrees to comply with its obligations as program executing agency.

#### **F. Cost recognition and revolving fund**

- 3.18 Since work will be necessary to start up the program prior to the first disbursement, the Bank will recognize spending of up to a total of US\$5 million from the local counterpart and up to US\$5 million as retroactive financing from the loan.
- 3.19 Owing to the types of activities to be carried out and the pace of execution, it is recommended that a revolving fund be established for up to 5% of the financing, which is equivalent to US\$5 million.

#### **G. Bank monitoring and supervision during the program**

- 3.20 Monitoring and evaluation will serve to identify problems and any changes that are needed in execution and/or goals. CONICIT will establish a four-member external advisory and monitoring committee that will meet at least twice during execution of the program within the three months prior to the special meetings referred to in

paragraph 3.23. The members of the committee, who will be distinguished specialists not directly linked to government institutions, will be appointed by CONICIT with the Bank's nonobjection. Two of the members will be Venezuelans and the other two will be foreigners residing abroad. The committee will be established within six months after the loan contract is signed. It will produce a report with comments and recommendations on the program to be presented within two months following the above-mentioned meetings of this committee.

- 3.21 The Country Office will monitor progress for the Bank, based on the program benchmarks (Annex III-3), and the information needed for that purpose will be gathered on the basis of responsibilities and modalities to be agreed upon with the Bank. In principle, program monitoring and evaluation will be performed in accordance with the following schedule.

**1. Start-up meeting**

- 3.22 Within no more than three months after the loan is declared eligible for disbursement, the borrower with the Bank's assistance will hold a seminar/workshop to launch the program. The event will be attended by the staff responsible for implementing the program and other program participants. The content, duration and other aspects will be agreed upon with the Bank.

**2. Annual reports and special meetings**

- 3.23 In March of each year, the executing agency will present a report on progress in each of the components as compared with the indicators and on compliance with each of the annual goals established in the program's benchmarks (Annex III-3), which will be used as the basis for the annual work plans. Two special review meetings will be held between CONICIT and the Bank's project team and will take place: i) 15 months from the date of eligibility for the first disbursement; and (ii) once 50% of direct project costs have been committed. The vice-president of CONICIT, the line managers with responsibilities for program execution, the program coordinator and the technical staff of the CU will attend the meetings.

- 3.24 The special reviews will include:

- a. A review of program execution in the previous period, including activities carried out and disbursements made.
- b. A comparison of the specific achievements of the program with the benchmarks.
- c. An evaluation of the execution mechanisms.
- d. Agreement on the plans of action for the following period, including corrective actions, possible changes in the regulations, allocation of funds by investment item, and new goals resulting from the review.

### **3. Final evaluation**

- 3.25 An external evaluation of performance and the main results will be performed during the final year of the program, as was done for stage one, to draw conclusions that can be used to guide future investments in the sector. The evaluation will be performed by an experienced consulting firm selected in agreement with the Bank. The cost of the evaluation has been included in the budget for component 7. Accordingly, neither CONICIT nor the Bank considers it necessary to perform an ex post evaluation of the program.

### **H. Environmental impact**

- 3.26 As was mentioned earlier, the program does not plan to finance new buildings and the operation is not expected to cause significant negative environmental impact. The Operating Regulations include specific criteria to ensure that the subprojects take adequate measures for waste management, particularly of laboratory waste.
- 3.27 In the specific case of the science and technology infrastructure component (component 3), all the subprojects must have an environmental plan which includes the management and disposal of waste from each laboratory or technology center, as a condition for approval. During the program, CONICIT will periodically monitor these subprojects to verify compliance with the actions included in the plan, whose implementation could also form part of a subproject to be financed by the program.

### **I. External auditing**

- 3.28 Each year the executing agency will present the financial statements for the program and for CONICIT, duly audited by an independent firm acceptable to the Bank. The financial statements are to be presented within 180 days after the close of the executing agency's financial year.

## **IV. PROGRAM FEASIBILITY, BENEFITS AND RISKS**

### **A. Feasibility**

#### **1. Economic and technical feasibility**

- 4.1 The academic projects (component 1) will be selected through a competitive procedure (peer review) with participation by external evaluators, at least one of whom will be a foreigner. A relevancy analysis was conducted of the academic research projects based on a representative sample that reasonably reflects the make-up of demand for projects of this kind, priority areas, applicant institutions and project costs. CONICIT has been satisfactorily managing this area for a number of years and no major difficulties are expected to arise in the second stage.
- 4.2 As mentioned in chapter I, CONICIT has made a significant contribution to training for high-level professionals engaging in scientific and technological research in Venezuela. The success of the training component (component 2) is ensured by the good management that CONICIT has traditionally demonstrated in financing master's and doctoral grants in Venezuela and abroad on the one hand, and by the fact that the grants are cofinanced by the sponsoring institutions, on the other. Experience with the first program indicates that this will assure the suitability and capacity of the candidates and their subsequent return and entry into research institutions in Venezuela. The analysis of the annual unit costs of the master's and doctoral grants to be financed by CONICIT abroad indicated that each of the items was reasonable. In this second stage, it is expected that there will be a significant reduction in the average cost of doctoral courses abroad, since at least 10% of them will be cooperative and/or "sandwich" programs. The proposed program plans to finance 200 doctorates and 300 master's degrees in Venezuelan universities, which cost about 60% less than postgraduate degrees abroad.
- 4.3 Financing for emerging institutions, technology centers and national laboratories (component 3) is intended to strengthen these institutions with one-time grants that will facilitate their subsequent sustainable performance. Evaluations of the proposals for funding under this component will pay special attention to the managerial capacity and future sustainability of the institutions.
- 4.4 For approval, the innovation projects in companies and the production agendas (component 4) must comply with merit criteria and an economic and technical analysis that includes aspects such as potential impact on the sector or production chain, evaluation of the potential market for the innovation, feasibility of applying the results in production, analysis of the limitations and risks of the project, and the managerial and financial capacity of the applicant company or center.
- 4.5 Last, the projects to disseminate and popularize S&T (component 5) and the S&T information projects (component 6) will be selected through public competitions and

evaluated on the basis of the quality of the proposal, social impact, relevancy and financial and administrative feasibility.

## **2. Financial and institution feasibility**

- 4.6 Continuation of the activities of this program is grounded chiefly in sustained government support. CONICIT has been using national budget resources to carry out activities similar to those that will be included in the proposed program, although some of them have been on a smaller scale.
- 4.7 Execution of the previous program has permitted CONICIT to gain broad experience in the promotion and administration of research projects in the academic and production sectors alike. The experience has also served to identify weak areas and some changes have been proposed in its organization. The inclusion of strengthening activities in the new program will help to optimize its execution of the second stage. The second program will be executed by CONICIT's line units, which will receive support as required from high-level external consulting services in order to monitor the projects to be financed under the program's different components. As a result of the new program, it is expected that CONICIT will become consolidated as a central institution for promoting science and technology in Venezuela. To avoid the problems that arose with centralized procurement of equipment in stage one, the new projects will be executed in a decentralized fashion, with the beneficiaries making the procurements for their R&D projects.

## **3. Environmental and social feasibility**

- 4.8 The program does not plan to finance new buildings and its implementation is not expected to have major negative environmental impact. On the contrary, it will bolster actions already initiated by CONICIT to support research on environmental protection, biodiversity, urban pollution, and clean technologies in innovative projects. The Operating Regulations for the program include specific criteria to ensure that the subprojects will take steps for suitable environmental management, including waste disposal, particularly the disposal of laboratory waste.
- 4.9 As mentioned earlier, CONICIT promotes research to find solutions to problems in Venezuelan society through the mechanism of research agendas, which will be supported under the proposed operation. Some of the agendas are working on the analysis of major social problems such as health in border areas, education and problems in today's cities. Other social areas will be examined during the program, such as problems related to the labor market, comprehensive protection for children, public security, and other significant issues.

## **B. Program benefits**

- 4.10 The program will help to strengthen Venezuela's capacity in science and technology, consolidating the progress made in stage one. It has been designed to promote the quality and relevance of research projects, the development of specialized human

resources for scientific and technological research, linkage between research centers and potential users of the results, and innovation and technological development in the production sectors.

- 4.11 The program will have a positive impact on modernizing higher education since it will support diversification of funding sources for universities and spur internal changes in those institutions to improve the quality and relevance of academic programs. The research activities promoted by CONICIT will enhance the qualifications of a considerable group of university researchers and professors, raising the quality of a good number of academic programs on the undergraduate, graduate and doctoral levels.
- 4.12 Closer coordination among the different players in the national innovation system, particularly closer ties between academe and industry and participation by researchers through the agenda mechanism in solving problems that are linked to the country's development will also help to make the academic programs of the country's universities more relevant.
- 4.13 The subcomponents for more solid sector technology centers, innovative projects in companies, technology extension services, industrial agendas and institutional strengthening of the intellectual property, metrology and standardization systems will help to modernize the production apparatus and boost its competitiveness.
- 4.14 With regard to the incentives established under the new execution mechanisms, funding for research projects chosen on a competitive basis can help to have several positive impacts, including: (a) diversification of the sources of funding for universities and centers by boosting their income from the sale of research and technology services, thus making them less reliant on direct government transfers; (b) consolidation of a mechanism to assign more funds to the universities and research and technology centers that present the best projects, creating a climate of competition for public funding as an alternative to the tradition of automatic allocation of public funds based on historical considerations, and introducing or strengthening result-based allocations; and (c) the most active and competitive researchers and programs will be rewarded, which will lead to better working conditions and single them out from others that are less committed to change.
- 4.15 By tapping the potential of information technologies and electronic data networks, the program will facilitate access and strengthen and expand technical information systems in different sectors. It will also make a start on actions to improve science teaching in schools and to publicize and popularize science and technology.
- 4.16 Strengthening Venezuela's science and technology capacity is a necessary factor for modern development but it is not the only one. Demand and interest must be aroused in the production sectors if that capacity is to bring the anticipated benefits. Therefore, the program has planned for a series of concurrent actions – such as the industrial agendas and technology extension services – to promote, foster and

facilitate linkage between companies, especially smaller operations, and sources of scientific and technological knowledge and information.

### **C. Program risks**

- 4.17 From an institutional standpoint, the program would have two main risks: (a) delays in implementing the plan to reorganize CONICIT's structure and procedures; and (b) the level of institutional backing for CONICIT.
- 4.18 The first risk is mitigated by the commitment of CONICIT's administration to implementing the changes identified when the proposed operation was being prepared. The program monitoring plan includes indicators to verify whether the planned institutional changes have been made. Venezuela has a critical mass of researchers and institutions that makes the program's activities viable. The new method of decentralized implementation, actions to strengthen CONICIT's line units, and the contracting of specialized external support will ensure that the program is executed satisfactorily within the planned time frame.
- 4.19 With respect to the second risk, the program enjoys wide backing in Venezuela. The new government has reaffirmed the priority of this second stage and has assigned a central role to science and technology as a key in boosting the country's capacity to generate and assimilate knowledge, improve the competitiveness of the production sectors and continue with the process of internationalization and diversification of the economy. CONICIT is recognized for its drawing power and the leadership it shows in getting the main players in the NIS to take concerted action and do their part.
- 4.20 Last, one financial risk that could affect the program is timely contribution of the local counterpart, although the government has been providing the necessary contributions for the first program. In the last seven years CONICIT's real budget has grown substantially, almost quadrupling in real terms between 1991 and 1998. Since 1992, funds for the first program have represented on average close to 15% of CONICIT's operations and over that period the government's contributions have matched or exceeded the required disbursement rate.

### Comparison of program actions with the recommendations contained in EVO's evaluation

Subject	Recommendation	Planned actions
National innovation systems	<u>Recommendation 1</u> : The Bank's policy should be updated, including an analysis of national innovation systems and suitable measures for strengthening them.	Program preparation included an analysis of the national innovation system which was used as guidance in defining several of the components.
Design of S&T programs	<u>Recommendation 2</u> : The scope of future programs should be broadened, including components to support the dissemination, assimilation and use of technologies.	The program includes components to support actions for the extension and dissemination of technology.
Sustainability of the development of national capacity	<u>Recommendation 3</u> : To ensure their sustainability, future programs and their policy frameworks should be supported by a broad consensus among the main players involved.	The agendas are programmatic measures to achieve consensus to guide the majority of research programs in production, social and environmental sectors.
Linkage between research institutions and society	<u>Recommendation 4</u> : Future programs should respond to demand, and cooperation between research institutions and society should be more explicit and systematic.	The social and production agendas identify relevant problems and areas for research that are incorporated in the requirements for project selection.
Executing agencies of S&T programs	<u>Recommendation 5</u> : More attention should be paid to strengthening the capacity of the executing agencies of S&T programs to deliver services, including better training for their staff and the development of institutional learning capacity to improve relations between these agencies and their clients. The IDB should reach agreements with executing agencies to establish performance indicators that reflect the efficiency of processes to finance projects, grants and other activities included in S&T programs.	When the program was being prepared, specialized consulting services suggested a process to improve and streamline CONICIT's internal procedures. The results have led to simplification of procedures and actions to improve management efficiency.
Bank supervision of programs	<u>Recommendation 6</u> : Program design should include procedures for Bank monitoring. One way of doing this is to program periodic reviews of program performance with the participation of experienced Bank staff.	The document proposes annual monitoring missions in which the project team will participate. Specialized consultants could also take part. An external advisory and monitoring committee will be established and will produce an annual report containing comments and recommendations on the program.
R&D promotion in private companies	<u>Recommendation 7</u> : The agencies responsible for financing innovation in private companies should be encouraged to perform ongoing evaluations of their portfolios to obtain quantitative and conclusive information on the impact of their programs. These exercises will contribute to the learning process in the agencies and will permit the IDB to improve the performance of these kinds of programs and evaluate the efficiency of the different forms of financing for technological innovation.	CONICIT's Innovation Programs Management Office will permanently monitor and evaluate the projects financed in companies through project managers who will be responsible for all stages in the project cycle.  Restructuring of CONICIT's project management system will shorten the time required to evaluate and approve applications for funding. The advanced information system that has been installed will permit ongoing monitoring of the time required for administrative processes.



Subject	Recommendation	Planned actions
Training	<u>Recommendation 8</u> : To produce an optimum impact, grant programs should require candidates to be linked to the institutional development plans of the sponsoring institutions.	The training grants for researchers included in the program will only go to candidates involved in institutional programs. The sponsoring institutions will have institutional development plans agreed upon beforehand with CONICIT.
Ex post evaluations	<u>Recommendation 9</u> : The design of future S&T programs should include an analysis of the logical framework with suitable indicators for monitoring performance. The respective contracts should include terms of reference for independent ex post evaluations.	Exercises were conducted during program preparation to identify the main problems to be addressed by the program and to construct a logical framework (Annex II-1) with performance indicators to be used for monitoring. The budget for the program includes an item to cover the cost of an evaluation of results at the end of the program.
The Bank's role	<u>Recommendation 10</u> : The Bank should continue its support for S&T programs, expanding their scope to include promotion of technical innovations and the dissemination and assimilation of technology.	The program includes components to support innovative projects in companies and technology extension activities.

## Summary comparison of the program with the IDB's new science and technology strategy recommendations

Typical problems in Latin American and Caribbean countries	Objectives	Activities planned in the program
<b>I. Systems approach</b>		
Weakness of the national innovation system	Coordinate public policies and create incentives for systematic cooperation by all the players involved in the national innovation system.	<ul style="list-style-type: none"> <li>Sector dialogues regarding the agendas</li> <li>Policy studies</li> <li>Sector evaluations</li> </ul>
<b>II. Greater emphasis on technology</b>		
Disconnect between technology supply and demand	Ensure a better fit between technology supply and demand.	<ul style="list-style-type: none"> <li>Component to finance innovation projects in companies</li> <li>Financing for joint projects between companies and R&amp;D laboratories</li> <li>Financing for projects on the production, social and environmental agendas</li> </ul>
Low productivity owing to lack of technology innovation	Promote the dissemination of appropriate technologies for the conditions in each country.	<ul style="list-style-type: none"> <li>Financing for technology extension programs</li> <li>Support for S&amp;T information programs</li> <li>Support for innovation infrastructure (metrology standards, intellectual property system)</li> <li>Financing for postgraduate studies in S&amp;T management</li> <li>Support for sector technology centers</li> <li>Training and upgrading for technical personnel</li> </ul>
Low competitiveness owing to insufficient technological innovation	Promote R&D in companies.	<ul style="list-style-type: none"> <li>Component to finance innovation projects in companies</li> <li>Strengthening of the intellectual property system</li> </ul>
<b>III. Ongoing support for scientific research with greater focus on critical areas</b>		
Lack of capacity for high-level research	Boost and refocus research efforts making more effective use of resources.	<ul style="list-style-type: none"> <li>Project financing based on competitive mechanisms with peer review</li> <li>Competitions for research projects will include minimum quotas to steer research into certain areas of interest based on S&amp;T strategies</li> <li>Institutional support for emerging institutions and national laboratories providing S&amp;T services</li> <li>Financing for joint projects involving several research groups</li> <li>Support for sector technology centers</li> </ul>
Low level of R&D capacity and scant linkage with development needs		

typical problems in Latin American and Caribbean countries	Objectives	Activities planned in the program
IV. Proactive support for small countries with fewer resources		
V. Increased support for education and training		
qualified human resource base	Overcome the shortage of qualified human resources and strengthen the education and training base.	<ul style="list-style-type: none"><li>▪ Doctoral and postdoctoral studies in Venezuela and abroad</li><li>▪ Special attention to support for postgraduate activities in certain selected areas</li><li>▪ Strengthening of integrated postgraduate programs involving various Venezuelan institutions</li><li>▪ Financing for programs to improve science and math teaching in schools</li><li>▪ Programs to disseminate and popularize S&amp;T</li></ul>

**LOGICAL FRAMEWORK  
SECOND SCIENCE AND TECHNOLOGY PROGRAM  
(VE-0112)**

Descriptive summary of objectives	Indicators	Means of verification	Assumptions
<p>Results of S&amp;T in Venezuela helped to achieve strategic objectives for the country's economic, social and cultural development.</p>	<ul style="list-style-type: none"> <li>Increased impact of S&amp;T on social policies.</li> <li>Increased impact of S&amp;T on processes to improve the production of goods and services.</li> <li>Increase in the country's competitiveness on international markets.</li> <li>Increase in value added in the production of goods and services.</li> </ul>	<ul style="list-style-type: none"> <li>Ad hoc studies</li> <li>Trade balance for S&amp;T</li> </ul>	<ul style="list-style-type: none"> <li>The creation and strengthening of mechanisms to link social policies and S&amp;T policies is promoted (design, execution and evaluation of policies and strategies).</li> </ul>
<p>Objective: National innovation system is developed and strengthened in function of the country's needs.</p>	<ul style="list-style-type: none"> <li>Suitable regulatory framework for S&amp;T.</li> <li>Increase in the number of state laws for S&amp;T (baseline = 12).</li> <li>Increase in the number of institutions that fund the NIS.</li> <li>Increase in funding in real terms for the NIS.</li> <li>Better spatial, institutional and sector distribution of funding for S&amp;T.</li> <li>Reduction in the drain of researchers.</li> <li>The number of active researchers in the NIS remains stable (estimated baseline = 5,000 researchers).</li> <li>Incorporation of 4% new high-level researchers in the NIS (estimated baseline = 5,000 researchers).</li> </ul>	<ul style="list-style-type: none"> <li>Updates of ad hoc studies and minutes of the meetings of CONICIT's Board</li> <li>Official Gazettes of the states and database of CONICIT's Decentralization Office</li> <li>Budget and statements of private funding</li> <li>BRAHMAN information system</li> <li>Publication of indicators on S&amp;T research capacity</li> <li>Database on S&amp;T management policies</li> <li>Researcher promotion program</li> </ul>	<ul style="list-style-type: none"> <li>The level of investment in the national innovation system is maintained after the end of the program.</li> <li>The creation and strengthening of mechanisms for linkage between social and industrial policies and S&amp;T policies is promoted (design, execution and evaluation of actions)</li> <li>Interinstitutional macroprojects are designed and implemented to create a shared vision of directions, conditions and roles to boost competitiveness, promote growth and increase the value added of Venezuelan exports.</li> </ul>

Descriptive summary of objectives	Indicators	Means of verification	Assumptions
<b>Program 1: Generation of S&amp;T knowledge</b>			
<p>ational innovation system is ed and strengthened in n of the country's needs.</p> <p><b>OSE:</b></p> <p>ty and space to generate nowledge is strengthened panded.</p>	<ul style="list-style-type: none"> <li>▪ 90% of research and technology projects with successful results (measured by CONICIT's evaluation criteria).</li> <li>▪ 90% of joint research and technology projects and programs with successful results (measured by CONICIT's evaluation criteria).</li> <li>▪ Sustained increase in high-level cooperative technical services.</li> <li>▪ Sustained increase in coverage of potential demand for high-level technical services.</li> <li>▪ The population of active researchers supported by CONICIT remains steady, taking 1998 as the base year, with a maximum variation of 10%.</li> <li>▪ Increase of 50% in the number of experienced researchers participating in joint projects (estimated baseline = 90 researchers).</li> <li>▪ Inclusion of new researchers in 25% of the projects financed by CONICIT.</li> <li>▪ At least nine new joint postgraduate programs (baseline = three programs).</li> <li>▪ New institutions obtain regular lines of financial support from the NIS.</li> </ul>	<ul style="list-style-type: none"> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ ORION information system</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continued strengthening of the mechanisms for coordination, participative decision making and larger numbers of players in the NIS make it possible to translate social needs and potential into the generation of knowledge and the development of cooperative advantages to supplement resources and create synergy.</li> <li>▪ The government and other social, academic and industrial stakeholders maintain their interest in the NIS, particularly in two basic aspects: support for quality research that is socially relevant, timely and feasible; and stress on the creation and development of research capacity to improve performance in the production sector and in the social field.</li> <li>▪ Investment levels in the NIS are maintained after the end of the program by diversifying sources, seeking national and international strategic alliances.</li> <li>▪ Cooperative processes with different public and private players are consolidated in the social, production and academic spheres in order to build interinstitutional networks that will help to define strategies for implementation of S&amp;T policies.</li> </ul>

Descriptive summary of objectives	Indicators	Means of verification	Assumptions
<p><b>COMPONENTS:</b></p> <p>S&amp;T projects financed.</p> <p>Human resources trained and involved in S&amp;T.</p> <p>S&amp;T infrastructure expanded and upgraded.</p>	<ul style="list-style-type: none"> <li>▪ 200 projects for experienced researchers financed (lasting three years).</li> <li>▪ 80 projects for new researchers financed (lasting two years).</li> <li>▪ 20 joint projects financed (lasting four years).</li> <li>▪ 200 doctoral grants abroad.</li> <li>▪ 500 postgraduate grants in Venezuela:               <ul style="list-style-type: none"> <li>(i) 200 doctoral grants</li> <li>(ii) 300 master's grants.</li> </ul> </li> <li>▪ 25 grants in S&amp;T management abroad and 20 in Venezuela.</li> <li>▪ 25 semiannual grants not leading to a degree.</li> <li>▪ 50 postdoctoral grants abroad.</li> <li>▪ 60 postdoctoral grants in the country.</li> <li>▪ 40 positions for new researchers financed.</li> <li>▪ 12 integrated postgraduate programs given one-time support.</li> <li>▪ 20 biannual chairs.</li> <li>▪ 16 emerging institutions receive one-time support.</li> <li>▪ Eight technology centers strengthened.</li> <li>▪ Ten national laboratories strengthened.</li> </ul>	<ul style="list-style-type: none"> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ ORION information system</li> </ul>	<ul style="list-style-type: none"> <li>▪ As strategies to strengthen and expand the capacity and space for generating S&amp;T knowledge, the players facilitate social intelligence processes linked to the use of information, making adequate use of existing databases.</li> <li>▪ Players outside CONICIT comply with their commitments.</li> </ul>

Summary of objectives	Indicators	Means of verification	Assumptions
<p>ES:</p> <p>selection, financing and award of projects by researchers. Hold competitions in three consecutive years: years 1 and 2 = 70 projects each; year 3 = 60 projects.</p> <p>selection, financing and award of projects by new researchers. Hold competitions in three consecutive years: years 1 and 2 = 70 projects each; year 3 = 60 projects.</p> <p>selection, financing and award of joint research projects (several groups). Hold competitions in two consecutive years: year 1 = 60 grants; years 2 and 3 = 70 grants each.</p> <p>selection, financing and award of grants abroad, hold competitions in three consecutive years: year 1 = 60 grants; years 2 and 3 = 70 grants each.</p> <p>selection, financing and award of grants in the country, hold competitions in three consecutive years: year 1 = 60 grants; years 2 and 3 = 70 grants; year 3 = 100 grants.</p> <p>selection and award of grants for training in S&amp;T abroad and 20 in the country.</p> <p>selection and award of grants not leading to a degree.</p>	<ul style="list-style-type: none"> <li>▪ US\$5.04 million</li> <li>▪ US\$750,000</li> <li>▪ US\$2.4 million</li> <li>▪ Total: US\$37.3 million</li> <li>▪ (Doctorate = US\$125,000 per grant)</li> <li>▪ (Doctorate = US\$34,000 per grant; Master's degree = US\$17,000 per grant)</li> <li>▪ Total: US\$2.2 million (US\$72,000 for grants abroad and US\$20,000 for grants in the country).</li> <li>▪ Total: US\$400,000 (US\$16,000 per grant)</li> </ul>	<ul style="list-style-type: none"> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ ORION information system</li> <li>▪ Records of the program coordinating unit</li> </ul>	<ul style="list-style-type: none"> <li>▪ Levels of cofinancing by the counterparts are maintained.</li> </ul>

Brief summary of objectives	Indicators	Means of verification	Assumptions
<p>Selection and award of postdoctoral training grants: for abroad, hold competitions in three consecutive years: years 1 and 2 = 20 grants each; year 3 = 10 grants.</p> <p>In the country, hold competitions in three consecutive years for 20 grants each.</p> <p>Selection, financing and award of projects to hire new researchers. Hold competitions in consecutive years, 10 grants for new researchers each year.</p> <p>Institutional support for integrated postgraduate programs.</p> <p>Financing for 20 research chairs.</p> <p>Financial support for 16 research institutions.</p> <p>Financial support to strengthen eight sector technology centers.</p> <p>Financial support to strengthen 10 national laboratories.</p>	<ul style="list-style-type: none"> <li>Total: US\$3 million</li> <li>(US\$30,000 per grant)</li> <li>(US\$25,000 per grant)</li> <li>Total: US\$1.3 million (US\$35,000 per new position)</li> <li>Total: US\$4.8 million (US\$400,000 per postgraduate program)</li> <li>Total: US\$1.4 million (US\$72,000 per chair)</li> <li>Total: US\$8 million (US\$500,000 each)</li> <li>Total: US\$4 million (US\$500,000 per center)</li> <li>Total: US\$8 million (US\$800,000 per laboratory)</li> </ul>		
<b>Program 2: Generation, transfer and use of scientific and technological knowledge for innovation in the production, social and environmental sectors and to boost regional programs</b>			
National innovation system is strengthened and strengthened in line with the country's needs			



Brief summary of objectives	Indicators	Means of verification	Assumptions
<p><b>Objectives:</b></p> <p>Transfer and use of knowledge for innovation in production, social and environmental sectors and programs strengthened and.</p>	<ul style="list-style-type: none"> <li>▪ Increase of 100% in the number of public and private institutions linked to innovation systems (baseline = 20 institutions).</li> <li>▪ Maintain at least 20 subject networks active.</li> <li>▪ Suitable distribution in spatial, social and productive terms of resources for innovation.</li> <li>▪ Include at least 50% new users of innovation know-how.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Legal consultation database</li> <li>▪ BRAHMAN information system</li> <li>▪ Publication of S&amp;T research capacity indicators</li> <li>▪ Project pipeline</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as for subprogram 1.</li> </ul>
<p><b>Activities:</b></p> <p>Innovation promoted in production sector.</p> <p>Technology extension delivered.</p> <p>Promotion, financing, and monitoring system agendas designed and</p> <p>Regional agendas</p>	<ul style="list-style-type: none"> <li>▪ 60 projects financed (lasting one year)</li> <li>▪ 100 consulting services performed</li> <li>▪ Production agendas: 40 projects financed (one year long)</li> <li>▪ Social and environmental agendas: 80 projects financed (three years long)</li> <li>▪ 25 programs financed</li> </ul>	<ul style="list-style-type: none"> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ Project portfolio</li> </ul>	<ul style="list-style-type: none"> <li>▪ As strategies to strengthen and expand the capacity for generating S&amp;T knowledge to permit innovation in the various regional sectors and fora, the players encourage social intelligence processes linked to the use of information, making adequate use of existing databases.</li> <li>▪ The social players that join subject networks continue to comply with their agreements independently of CONICIT.</li> </ul>
<p><b>Resources:</b></p> <p>Selection, financing and management of innovation projects. Competitions in four consecutive years for 15 projects.</p> <p>Technology extension and consulting services.</p> <p>Promotion, financing, and monitoring of the</p> <p>Production: Hold competitions for two consecutive years for 20 projects each.</p>	<ul style="list-style-type: none"> <li>▪ Total US\$6 million (US\$100,000 per project)</li> <li>▪ US\$1.5 million per year</li> <li>▪ Total US\$6 million</li> <li>▪ US\$1.5 million per year for four years</li> <li>▪ Total US\$20 million</li> <li>▪ US\$5 million per year</li> <li>▪ Total US\$8 million (US\$200,000 per project)</li> </ul>	<ul style="list-style-type: none"> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ Records of the program coordinating unit</li> </ul>	<ul style="list-style-type: none"> <li>▪ The players that join the subject networks comply with their commitments.</li> </ul>

Brief summary of objectives	Indicators	Means of verification	Assumptions
<p>Social and environmental: Hold competitions in two consecutive years for 40 projects each.</p> <p>Promotion, financing, and monitoring of the agendas. Hold one session for 25 programs in</p>	<ul style="list-style-type: none"> <li>Total US\$12 million (US\$150,000 per project)</li> <li>Total US\$8 million (US\$320,000 per program)</li> <li>US\$2 million a year for four years</li> </ul>		
<b>Program 3: Dissemination and popularization of scientific and technological knowledge and access to information</b>			
<p>National innovation system is strengthened in line with the country's needs</p> <p>SE: to disseminate and promote S&amp;T and access to information expanded.</p>	<ul style="list-style-type: none"> <li>Increase of 100% in the demands received from institutions and the general public for informal dissemination of S&amp;T.</li> <li>Increase of 100% in alliances between CONICIT and institutions that disseminate S&amp;T.</li> <li>Increase of 100% in joint activities by the different players that disseminate S&amp;T.</li> <li>Increase of 100% in the number of consultations of web pages established with CONICIT funds (baseline = 360,000 consultations a year).</li> <li>40 new documentation centers and libraries included in the academic network.</li> <li>30 scientific journals maintained and included in the academic network.</li> </ul>	<ul style="list-style-type: none"> <li>BRAHMAN information system</li> <li>Academic network</li> <li>Database on projects, statistics for successful programs</li> </ul>	<ul style="list-style-type: none"> <li>Same as subprogram 1.</li> </ul>

Descriptive summary of objectives	Indicators	Means of verification	Assumptions
<p><b>OBJECTIVES:</b></p> <p>Dissemination of S&amp;T information generated and popularized.</p> <p>Programs to establish and disseminate S&amp;T information generated, promoted, financed and consolidated.</p>	<ul style="list-style-type: none"> <li>32 videos and publications for dissemination and popularization per year for four years (total = 128 videos and publications).</li> <li>18 dissemination and popularization events a year in years 1 and 2, 20 in year 3 and 22 in year 4 (total = 78 events).</li> <li>16 designs and materials adapted to improve S&amp;T teaching in year 1, 18 in year 2, 20 in year 3 and 22 in year 4 (total = 76).</li> <li>48 information projects financed (lasting one year).</li> <li>Four subject networks created and consolidated.</li> </ul>	<ul style="list-style-type: none"> <li>BRAHMAN information system</li> <li>NIRVANA information system</li> <li>Academic network</li> </ul>	<ul style="list-style-type: none"> <li>The players involved adopt the strategy of making adequate use of existing databases to obtain information.</li> <li>The players outside CONICIT comply with their commitments.</li> </ul>
<p><b>ACTIVITIES:</b></p> <p>Support for the design of materials and audiovisual materials to popularize S&amp;T.</p> <p>Financing for events to disseminate and popularize S&amp;T.</p> <p>Support for the design and dissemination of methodologies and materials to improve science teaching.</p> <p>Support for scientific publications (journals).</p> <p>Selection, financing and management of information projects.</p> <p>Hold competitions in consecutive years: years 1 = 15 projects each; year 3 = 15 projects; year 4 = 8 projects.</p> <p>Strengthening of the subject networks.</p>	<ul style="list-style-type: none"> <li>Total US\$2 million</li> <li>US\$500,000 a year for 4 years</li> <li>Total US\$2 million</li> <li>US\$500,000 a year for 4 years</li> <li>Total US\$2 million</li> <li>US\$500,000 a year for 4 years</li> <li>Total US\$4 million</li> <li>US\$1 million a year for 4 years (30 journals a year)</li> <li>Total US\$6 million (US\$125,000 per project)</li> <li>US\$1,875,000 year 1; US\$1,875,000 year 2; US\$1,250,000 year 3; and US\$ 1 million year 4</li> <li>Total US\$ 2 million</li> <li>US\$500,000 as a one-time grant per network for 4 networks</li> </ul>	<ul style="list-style-type: none"> <li>BRAHMAN information system</li> <li>NIRVANA information system</li> <li>Records of the program coordinating unit</li> </ul>	

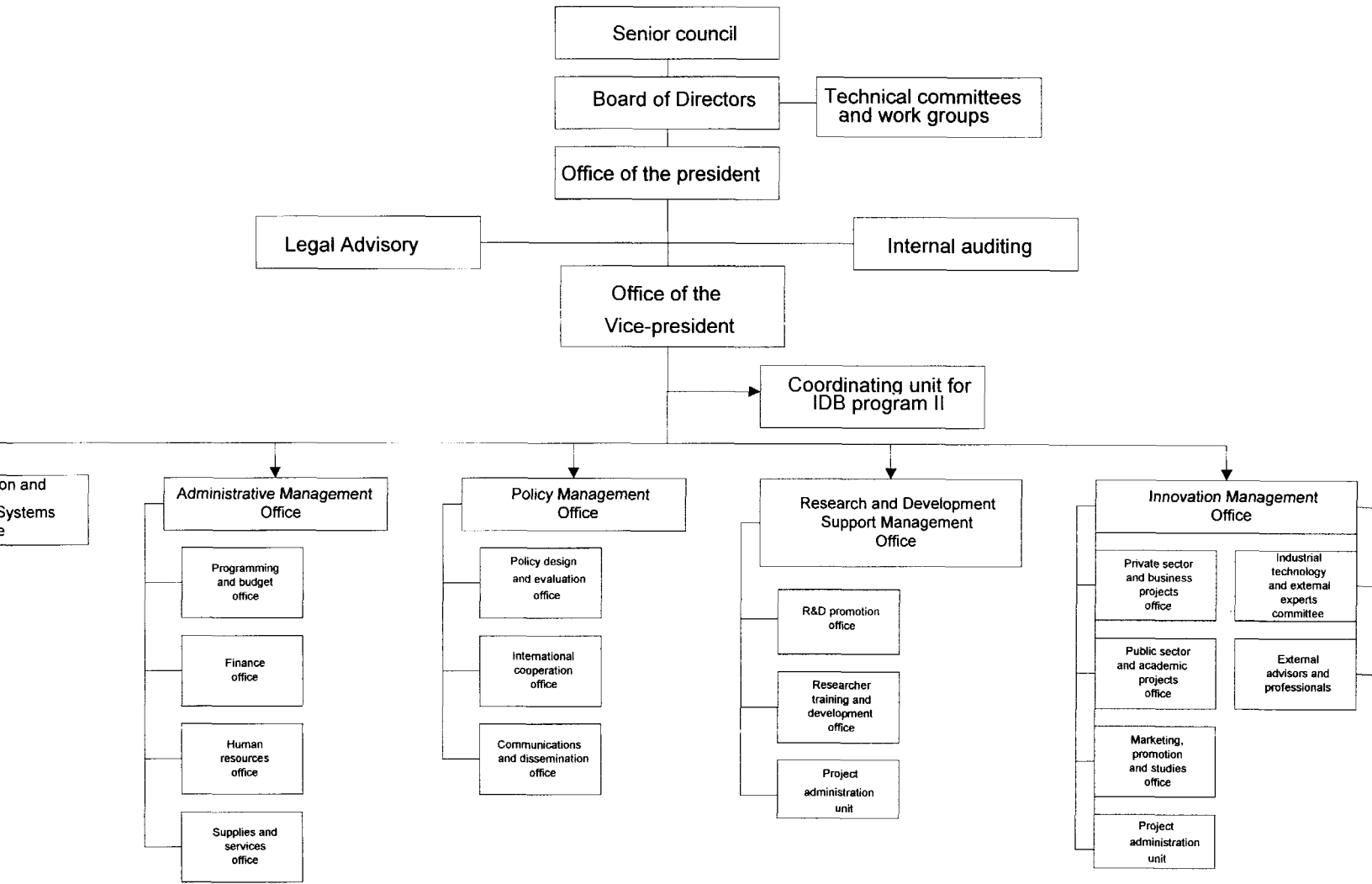
Descriptive summary of objectives	Indicators	Means of verification	Assumptions
<b>Program 4: Institutional strengthening</b>			
<p>national innovation system is strengthened and strengthened in line with the country's needs.</p> <p><b>SE:</b></p> <p>national capacity of CONICIT for institutions in the innovation system strengthened.</p>	<ul style="list-style-type: none"> <li>▪ Increase in the number of consultations of SAPI by businesses.</li> <li>▪ Increase in the types and quality of metrology and standardization services.</li> <li>▪ Existence of interinstitutional coordination mechanisms to generate S&amp;T indicators.</li> <li>▪ Existence of sufficient information to develop and implement NIS policies.</li> </ul>	<ul style="list-style-type: none"> <li>▪ SAPI databases</li> <li>▪ BRAHMAN information system</li> <li>▪ Specialized publications</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as subprogram 1.</li> </ul>
<p><b>COMPONENTS:</b></p> <p>Patent and intellectual property system strengthened and improved.</p> <p>Metrology and standardization services strengthened and adequate.</p> <p>System of indicators for activities adequate.</p> <p>Policy and planning strengthened.</p> <p>CONICIT strengthened.</p>	<ul style="list-style-type: none"> <li>▪ Increase in the number of patents granted as compared with the number of applications.</li> <li>▪ Increase in the availability of SAPI statistics.</li> <li>▪ Increase in the types and quality of metrology and standardization services.</li> <li>▪ System of indicators with a satisfactory evaluation.</li> <li>▪ Six studies performed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ SAPI databases</li> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ Specialized publications</li> </ul>	

Descriptive summary of objectives	Indicators	Means of verification	Assumptions
<p><b>ACTIVITIES:</b></p> <p>Support for the patent intellectual property system.</p> <p>Activities to strengthen technology services.</p> <p>Activities to strengthen industrialization services.</p> <p>Activities to upgrade the of indicators for S&amp;T es.</p> <p>Selection, financing and ring of policy and planning</p> <p>Activities to strengthen CIT.</p>	<ul style="list-style-type: none"> <li>▪ Total US\$1.5 million</li> <li>▪ Total US\$2 million</li> <li>▪ Total US\$500,000</li> <li>▪ Total US\$1 million</li> <li>▪ Total US\$2 million</li> <li>▪ Total US\$5 million</li> </ul>	<ul style="list-style-type: none"> <li>▪ BRAHMAN information system</li> <li>▪ NIRVANA information system</li> <li>▪ Records of the program coordinating unit</li> </ul>	

Scale of the program by component and activity

Activity		Number of supports	Average unit value (US\$ million)	Total activity (US\$ million)	Total component (US\$ million)
<b>1</b>	<b>Financing for R&amp;D projects</b>				<b>40.0</b>
1(a)	Experienced researchers	200	0.120	24.0	
1(a.2)	New researchers	80	0.050	4.0	
1(b)	Joint research projects	20	0.600	12.0	
<b>2</b>	<b>Training</b>				<b>50.0</b>
2(a)	Postgraduate grants abroad	200	0.125	25.0	
2(a)	Postgraduate grants in Venezuela (doctorate)	200	0.034	6.8	
2(a)	Postgraduate grants in Venezuela (master's degrees)	300	0.017	5.1	
2(b)	Grants for training in S&T management abroad	25	0.072	1.8	
2(b)	Grants for training in S&T management in Venezuela	20	0.020	0.4	
2(c)	Grants not leading to a degree	25	0.016	0.4	
2(d)	Postdoctoral grants abroad	50	0.030	1.5	
2(d.2)	Postdoctoral grants in Venezuela	60	0.025	1.5	
2(e)	Positions for new researchers	40	0.0325	1.3	
2(f)	Support for integrated postgraduate programs	12	0.400	4.8	
2(g)	CONICIT chairs	20	0.070	1.4	
<b>3</b>	<b>Institutional support</b>				<b>20.0</b>
3(a)	Emerging institutions	16	0.500	8.0	
3(b)	Technical centers	8	0.500	4.0	
3(c)	National laboratories	10	0.800	8.0	
<b>4</b>	<b>Technological innovation</b>				<b>40.0</b>
4(a)	Innovation projects	60	0.100	6.0	
4(b)	Technology extension services	100	0.060	6.0	
4(c)	Social agendas	80	0.150	12.0	
4(d)	Production agendas	40	0.200	8.0	
4(e)	Regional agendas	25	0.320	8.0	
<b>5</b>	<b>Dissemination and popularization</b>				<b>10.0</b>
5(a)	Support for the design of publications and audiovisual products	Global		2.0	
5(b)	Popularization events	Global		2.0	
5(c)	Design of contents and materials to improve science teaching	Global		2.0	
5(d)	Publication of science and technology journals	30 journals (4 years)	0.33/journal/year	4.0	
<b>6</b>	<b>S&amp;T information</b>				<b>8.0</b>
6(a)	Information projects	48	0.125	6.0	
6(b)	Strengthening of S&T subject information networks	4	0.500	2.0	
<b>7</b>	<b>Institutional strengthening</b>	Global			<b>12.0</b>
	Total direct and concurrent costs				<b>180.0</b>

CONICIT ORGANIZATION CHART



## TENTATIVE PROCUREMENT PLAN

Item Description	Financing	Bidding	Procurement	Dates
<b>Goods (as part of projects)</b> <b>Value added: US\$16.7 million</b> Technical equipment of different kinds, laboratory equipment, computer equipment, etc. will be procured. Given the individual and innovative features of each project it is impossible to define typical lots or specific bid calls and therefore the following information is provided by way of illustration only. The figures will be adjusted each year.				
1. Year 1, 4 bid calls, US\$3.9 million	IDB 50%	IPB	No	II/99, I/00
2. Year 2, 7 bid calls, US\$4.7 million	IDB 50%	IPB	No	II/00, I/01
3. Year 3, 7 bid calls, US\$4.7 million	IDB 50%	IPB	No	II/01, I/02
4. Year 4, 4 bid calls, US\$3.5 million	IDB 50%	IPB	No	II/02, I/03
<b>Services (as part of projects)</b> <b>Value added: US\$112.2 million</b> The projects will contract individual and institutional researchers. Owing to the special nature of each project, the figures presented are aggregates for all the projects anticipated in each year of execution. No contracts are expected to be worth more than US\$200,000. The figures will be adjusted each year.				
1. Year 1, multiple contracts, US\$26.8 million	IDB 50%	LPB	No	Bids will be called throughout each year during implementation.
2. Year 2, multiple contracts, US\$33.2 million	IDB 50%	LPB	No	
3. Year 3, multiple contracts, US\$31.4 million	IDB 50%	LPB	No	
4. Year 4, multiple contracts, US\$20.8 million	IDB 50%	LPB	No	
<b>Training services</b> <b>Value added: US\$50 million</b> Grants and other types of scientific training will be financed which cannot be defined in advance owing to their individual nature. However specific public calls will be issued on the local level. Training may be in Venezuela or abroad.				
	IDB 50%	LPB	No	Multiple bids will be called during implementation.

IPB = International public bidding

LPB = Local public bidding



## PROGRAM BENCHMARKS

COMPONENT	Unit	Year 1	Year 2	Year 3	Year 4	Total
<b>1. Projects</b>						
1(a) Experienced researchers	# projects	70	70	60		200
1(b) New researchers	# projects	25	25	30		80
1(c) Joint research projects	# projects	10	10			20
<b>2. Training</b>						
2(a) Postgraduate grants	# grants					
i. abroad		70	70	60		200
ii. in Venezuela						
Doctorate		70	70	60		200
Master's		100	100	100		300
2(b) Grants for training in S&T management	# grants					
i. abroad		15	10			25
ii. in Venezuela		10	10			20
2(c) Grants not leading to a degree	# grants	6	7	6	4	25
2(d) Postdoctoral grants	# grants					
i. abroad		20	20	10		50
ii. in Venezuela		20	20	20		60
2(e) Positions for new researchers	# supports	10	10	10	10	40
2(f) Support for national postgraduate programs						
i. integrated programs	# projects	6	6			12
ii. CONICIT chairs	# chairs	5	5	5	5	20
<b>3. Strengthening of R&amp;D centers</b>						
3(a) Emerging institutions	# projects	4	4	4	4	16
3(a) Sector technical centers	# projects	2	2	2	2	8
3(a) National laboratories	# projects	3	4	3		10
<b>4. Promotion of innovation</b>						
4(a) Innovation projects in companies	# projects	15	15	15	15	60
4(b) Technology extension services	# projects	25	25	25	25	100
4(c) Production and social agendas	# projects	30	30	30	30	120
4(d) Regional research agendas	# projects	5	7	7	6	25

COMPONENT	Unit	Year 1	Year 2	Year 3	Year 4	Total
<b>5. Dissemination and popularization of S&amp;T</b>						
5(a) Design of dissemination products	Global (US\$ million)	0.5	0.5	0.5	0.5	2.0
5(b) Popularization events	Global (US\$ million)	0.5	0.5	0.5	0.5	2.0
5(c) Design of contents and materials to improve science teaching	Global (US\$ million)	0.5	0.5	0.5	0.5	2.0
5(d) Scientific journals	# annual supports	30	30	30	30	120
<b>6. Information services</b>						
6(a) Information projects	# projects	15	15	10	8	48
6(b) Subject networks	# projects	1	1	1	1	4
<b>7. Institutional strengthening and concurrent costs</b>						
	Global (US\$ million)	3	3	3	3	12

Note: The amounts indicated refer to projects, grants or supports approved in the respective year.

### Special studies

The following studies will be conducted in year one of the program:

1. Improving the design of the system of S&T indicators;
2. Analysis of strategies for an industrial extension system;
3. Basic studies to strengthen the intellectual property system;
4. Strategies to strengthen the standardization systems;
5. Study of strategies to strengthen the national innovation system;
6. Analysis of training policies in strategic areas.

PROPOSED RESOLUTION

VENEZUELA. LOAN \_\_\_/OC-VE TO THE REPUBLIC OF VENEZUELA

(Second Program of Science and Technology)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Venezuela, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the Second Program of Science and Technology. Such financing will be for the amount of up to US\$100,000,000, which are part of the Single Currency Facility of the ordinary capital resources of the Bank, and will be subject to the "Terms and Financial Conditions" and the "Special Contractual Conditions" of the Executive Summary of the Loan Proposal.