

PROJECT TO SUPPORT TECHNOLOGICAL INNOVATION IN NICARAGUA

(NI-0147)

EXECUTIVE SUMMARY

Borrower:	Republic of Nicaragua	
Executing agency:	Ministry of Development, Industry, and Trade (MIFIC), acting through the Nicaraguan Science and Technology Council (CONICYT).	
Amount and source:	IDB: (FSO)	US\$6.79 million
	Local contribution ¹ :	US\$2.67 million
	Total:	US\$9.46 million
Terms and conditions:	Amortization period:	40 years
	Grace period:	10 years
	Disbursement period:	30 months (plus six months to finance the project audit)
	Interest rate:	1% for first 10 years, 2% thereafter
	Inspection and supervision:	1% of loan amount
	Credit fee:	0.5% per year on disbursed balance
Objectives:	<p>The general objective of the project is to lay the foundations for a framework of action ("enabling conditions") that facilitates technology transfer and technological innovation in small and medium-sized businesses. The project's specific objectives are: (i) to expand and deepen the market for technology services; (ii) to pilot, under controlled conditions, organizational and financial arrangements that facilitate technological innovation; and (iii) to strengthen the capacities of bodies that coordinate supply and demand among technology services.</p> <p>At the end of the project, on the basis of lessons learned, the government will decide how and how much to increase its investment in science and technology. These lessons will make possible: (i) an appropriate institutional strategy; (ii) a national innovation system capable of coordinating technological changes, and, hence, an expansion/deepening of the market for technology services; (iii) minimal State participation as facilitator and regulator of the sector; (iv) greater awareness of the benefits and applicability of new technologies; (v) a framework of sustainability including an</p>	

¹ This amount will include up to the equivalent of US\$1.6 million from the project beneficiaries.

institutional proposal for obtaining funds from different sources; and (vi) a larger number of SMEs capable of achieving high levels of quality and productivity on a long-term basis.

Description: The project consists of two components:

Component 1. Pilot scheme to remove obstacles to supply and demand: Matching grants and financial outsourcing

This component will test out new mechanisms for delivering matching grants for technological innovation in SMEs, and for projects to strengthen technology service laboratories. This funding mechanism is expected to: (i) stimulate and meet the demand for technological innovation; (ii) improve the supply of services; (iii) encourage joint SME-university projects; and (iv), contribute to higher export value-added in the longer run.

Component 2. Strengthening of national innovation system (NIS)

This component will support: (i) a strengthening of the Nicaraguan Science and Technology Council (CONICYT), as the central pillar and facilitator for NIS development, and of the Technology, Standardization and Metrology Office (DTNM)—given the relevance of its functions both to CONICYT and to the project; (ii) gradual incorporation of the project's coordinating unit (CU) as CONICYT executive secretariat during project execution; (iii) establishment of a supervision, monitoring and evaluation system; (iv) creation of a pilot network of technology facilitators to serve as intermediaries between SMEs and technology service providers; and (v) testing of new NIS coordination models.

Justification for an innovation and learning loan:

This project qualifies as an innovation loan given that:

1. **Lessons will be learned from a new institutional experience:** the project will trial an administrative outsourcing plan for channeling finance to SMEs (paragraphs 2.5; 2.6). This will afford an insight into this method, and provide new institutional experience with the technological facilitators network (paragraph 2.15), which is to be implemented for the first time. In addition, a sustainable financing scheme will be agreed and proposed (paragraph 2.10). Also, a method for analyzing and financing small-scale technological projects to enhance SME productivity will be tested for the first time (paragraph 2.7). This is expected to be useful for many other financial institutions, thereby generating positive institutional externalities.

2. **Flexibility will be added to the design:** the various methods for delivering services and disseminating information on innovation-related technological change will provide the coordinating unit with the feedback needed to foster the emergence of designs that were unforeseeable during the preparation stage.
3. **A new institutional framework for action will be tested:** the use of science and technology to achieve a massive increase in SME productivity and competitiveness is a new concept for Nicaragua's economic development.
4. **Mechanisms will be tested for using appropriate information and communication technologies** aimed at minimizing information asymmetries, in accordance with the specific needs of SMEs and the country.

Relationship of the project to the Bank's strategy for the sector and the country:

In Nicaragua, the Bank is involved in supporting the enhanced poverty reduction strategy (ERRP). The present project is a key tool for implementing that strategy. With the leading role assigned to SMEs, this operation, which facilitates access to financing and an increase in technical support services, is consistent with the Bank's country strategy and with the Eighth Replenishment.

Environmental and social review:

The Operating Regulations (Component 1, Matching Grants) contains specific criteria to ensure the subprojects financed do not generate negative environmental impacts. Specifically, it will be a prerequisite that participating SMEs be compliant with national regulations on the environment, or be in the process of compliance. In addition, the technology facilitators (TFs) will receive training to identify possible environmental impacts in the activities of the firms involved. Apart from this, technology facilitation centers (TFCs) will contain electronic information on clean technologies and other procedures for recognizing harmful environmental effects and mitigating them.

Benefits:

This project will provide experience of new institutional arrangements, and will facilitate institutional strengthening among the NIS entities involved. These outcomes will help to eliminate obstacles to technology transfer and set the stage for overcoming three major concurrent bottlenecks that restrict the potential of SMEs to participate in the global economy: funding, information and timely technical support for technological innovations. The project will allow collective learning about the uses of science and technology, which will foster better coordination of interests and economic exchange between the various actors in the national innovation system.

Risks:

The project's main risk is that CONICYT may fail to obtain a permanent budget to maintain an effective organization, and that it does not hire experienced staff from the CU, a basic requirement for providing leadership in the administration of technological change in the country.

This risk can be overcome, however, since: (i) the mandate CONICYT has been given to carry out its functions is established in its charter; (ii) the support provided in this project for disseminating its benefits and the lessons learned will be very well targeted, in order to gain allies to support project sustainability; (iii) additional measures have been taken to make the project sustainable, including preparation of a proposal at the end of the project for a fund capture mechanism, the Nicaraguan Technological Innovation Fund (FONITEC); and (iv) the facilities for financing (matching grants), and for promotion and forging closer relations with SMEs (facilitators network), will turn the latter into key interest groups along with other new actors involved. And finally, CONICYT, along with the increased productivity/income resulting from its actions, are crucial for achieving the objectives of the enhanced poverty reduction strategy, so the national budget is expected to contribute to its sustainability.

Special contractual clauses:**Special conditions precedent to disbursement of the loan:**

The borrower shall demonstrate to the Bank that: (i) the Project Coordinating Unit has been set up with a complement of technical staff and it has been equipped with the work materials required for it to function in accordance with the terms and conditions previously agreed on with the Bank (paragraph 3.8), and (ii) CONICYT's regulations have entered into effect.

Once the loan contract has been duly signed and is in effect, and after the general conditions precedent to the first disbursement have been satisfied and before the borrower has hired the technical experts for the CU, it is recommended that the Bank disburse up to the equivalent of US\$100,000 from the loan proceeds for the purpose of engaging the aforesaid experts and defraying their fees.

The loan contract will also contain standard Bank conditions relating, among other things, to audits, reports, inspections, evaluations, maintenance, and procurement of goods and services.

Poverty-targeting and social sector classification:	This operation does not qualify as a poverty-targeted investment (PTI) or as a social-equity enhancing project, as described in the indicative targets mandated by the Bank's Eighth Replenishment (document AB-1704 (paragraph 4.9).
Exceptions to Bank policy:	None.
Procurement:	The procurement of goods and related services and the contracting of consulting services will be carried out in accordance with Bank's usual policies and procedures. The project does not entail procurement for civil works. International competitive bidding will be required for: (i) goods and related services in amounts greater than, or equal to, US\$250,000; and (ii) for consulting services in amounts over US\$200,000. The procurement of goods and related services and the hiring of consulting services in amounts below the thresholds indicated will be governed, in principle, by the provisions of national legislation (paragraph 3.35).

I. BACKGROUND

A. Summary of the project

- 1.1 Greater industrial output during the 1990s is currently affording Nicaragua new opportunities in world trade, which SMEs will be able to take advantage of to increase their sales and revenues. Demand for new technologies stems from this.
- 1.2 This project will lay the foundations for enabling conditions to disseminate new technologies appropriate to small and medium-sized enterprises (SMEs) that wish to be productive—in other words, a program to promote technological innovation. In addition, small-scale prototypes of essential organizational arrangements aimed at boosting the national innovation system (NIS)¹ will be tested. These prototypes will facilitate the dissemination of technology within a controlled sphere of action—focusing on three economic sectors only. To this end, the demand for technology services will be stimulated, and the management capacity of public institutions responsible for coordinating technological changes will be strengthened.

B. Situation of businesses and SMEs in Nicaragua

- 1.3 Small enterprises predominate in Nicaragua. In December 1996, there were 49,718 microenterprises of between two and five workers each (with potential for upgrading to small firms); 4,526 small firms (6-20 workers); 569 medium-sized enterprises with 21 to 50 workers; 143 medium-sized enterprises with 51 to 100 workers; and 161 large firms, with a workforce of over 100. SMEs vary considerably not only in size but also in terms of their human resource skills. The SME category includes exporting firms and other firms that supply them. According to the SME Development Policies Office of the Ministry of Industry, Development and Trade (MIFIC), these firms “have high potential, but are constrained by bottlenecks that realistically could be overcome.”
- 1.4 **SMEs have a key role to play in poverty reduction.** The challenges of the *enhanced poverty reduction strategy (ERRP)*, on which national development hinges, include (i) increasing SME incomes; and (ii) disseminating appropriate technologies among them. For this, SMEs will need to identify opportunities and compete, which calls for a review of the basic determinants of sales: price, quality and delivery. Accordingly, their production and marketing activities need to be reorganized on the basis of modern technologies.
- 1.5 The ERRP is targeting SMEs because they account for the majority of the country’s businesses and have flexible productive processes. Flexibility is essential for

¹ A country's NIS is the cornerstone of its productivity and competitiveness and at the heart of the Bank's "Science and Technology" strategy. The NIS is a set of all agents, institutions, and policies (regardless of the number of beginners) associated with the introduction of new technologies to an economy (regardless of complexity of these technologies).

competing internationally. In addition, SMEs: (i) generate a large number of jobs; (ii) use national raw materials in larger amounts; (iii) need little investment and financing to compete; and (iv) achieve vertical productive linkages anchored on large industries or horizontal linkages through consortia.

- 1.6 Project preparation entailed studying the demand for technology services in sectors that have the potential to be competitive: leather goods; dairy products; seafood (lobster, shrimp, scaled fish); among others. It was concluded that the demand for technology services is not being fully satisfied, and that out of 3,634 firms, 1,603 would be capable of innovation if obstacles to technology supply and demand did not exist. As this is a pilot project, it will only deal with between 45 and 60 enterprises (or projects) with an inclination toward innovation. Attitudes to technological change among SMEs were determined through workshops, and it was discovered that at least 30 of those interviewed would be willing to finance the small strategic innovations needed. This shows that now would be a good time to start the trials proposed in this project.

C. Description of the science and technology system

- 1.7 The Nicaraguan Science and Technology Council (CONICYT) is the body responsible for promoting science and technology throughout the country, and for preparing policy proposals in science, technology and innovation. CONICYT, together with the Technology, Standardization and Metrology Office (DTNM), are dependencies of the Ministry of Industry, Development and Trade (MIFIC). The DTNM draws up proposals for developing the national system of technical and quality standardization, enforces laws relating to industrial metrology, and acts as technical secretariat for CONICYT. It also has other important technical support responsibilities in other sectors under the Consumer Protection Act.
- 1.8 CONICYT was created via Decree 5-95, with representatives from the government, scientific, civil society, technical and productive sectors, presided by the incumbent MIFIC Minister. It has the power to set up sector and inter-sector committees in fulfilling its objectives, functions and attributions.
- 1.9 Most scientific research is carried out by the 10 universities that belong to the National University Council, which includes Universidad Nacional Autónoma de Nicaragua, Managua (UNAN-Managua), Universidad Nacional Autónoma de Nicaragua, León (UNAN-León), Universidad Nacional de Ingeniería (UNI), Universidad Nacional Agraria (UNA) and Universidad Centroamericana (UCA). Generally speaking, research is concentrated in a few teaching departments and research centers, and is mostly funded from abroad. In general, research and development is inadequately linked to commercial opportunities, which makes joint participation with the SME sector very difficult. In addition, there are both public and private national laboratories.

D. Diagnosis: there are several access barriers to appropriate technologies

- 1.10 There are a number of obstacles that complicate making use of appropriate technologies. Full integration into the globalization process complicates the panorama still further, for melding into the global environment is costly, and appropriate technologies are hard to identify, evaluate, finance and adapt. In addition, still-persisting traditional routines and habits hinder the emergence of a frequent-technological change-friendly culture. The obstacles that have been identified are listed below.

1. Obstacles to the demand for technology services

- 1.11 **Low education levels.** In general, SME human resources have very low education levels. Few enterprises employ university graduates, and they nearly all lack information on appropriate technologies. They need help in diagnosing their problems but lack links between their demand for support services and the supply thereof (universities, research centers, laboratories). Result: SMEs do not have the knowledge needed to achieve greater productivity. An SME's owner is usually its most qualified worker and the only beneficiary of training programs. Middle managers (supervisors and product-line chiefs) usually have secondary or technical education; some are completing higher education, while very few have access to training. The education obtained is deficient. Few SMEs have access to professional staff with either experience or postgraduate training.
- 1.12 **Scant supply of financing.** The supply of bank financing for SMEs is very limited. Bank loans for innovation and quality improvements are almost non-existent, because the technological risk run by SMEs that apply for credit is considered very high, and the banking sector does not have experience in assessing this type of risk. In addition, SMEs' capacity to negotiate loans is inefficient, and the financial system is going through a critical period with weak institutions and low liquidity; as a result, the banks prefer to provide loans for larger amounts to large firms that can post collateral.
- 1.13 **Little attention to quality standards.** Many SMEs consider standards to be unnecessary. Others see them as implying higher costs, with no significant benefits. Such interpretations involve an incorrect cost-benefit calculus for investment in technologies. The capacity to analyze an investment of this type, and the ability to use available technologies appropriately, are generally lacking. As traditional customers do not notice quality differences with the facility of importers from advanced countries, corrections are not implemented.

2. Obstacles to the supply of technology services

- 1.14 **Technology services suppliers do not meet the desired standards.** Nonetheless, there are good examples of universities that sell services to local entrepreneurs:

Universidad Nacional de Ingeniería (UNI) sells consulting services in civil engineering processes; Universidad Nacional Autónoma de Nicaragua, León (UNAN-León) has developed a clean bio-insecticide to control pests; both of these also carry out research “on request” for producer-clients. The UNAN-Managua laboratories run Health Ministry studies on water quality. The problem is that they cannot respond to several requests simultaneously, and they do not have the equipment they need; in other words, they require structural changes. They also need to prepare and disseminate an inventory of each institution’s capacity to provide technology services and development. The important thing is that there is willingness on part of management.

- 1.15 National laboratories, both public and private, which constitute another important supply group, face major constraints. For example the food laboratory, [Laboratorio Alimentario] (LABAL), which was the only one in the area, lost its entire equipment in a flood. As a result, the country lacks a benchmark laboratory to provide food quality control services. Other laboratories have obsolete or inadequate equipment and cannot guarantee the quality required by the burgeoning demand from productive sectors.
- 1.16 **Low-skilled human resources.** Some studies blame the country’s low productivity on a lack of skilled human resources. Shortcomings in technical-vocational education and at primary level, compounded by scant interest in science education, help to perpetuate low skill levels and undermine potential for training in more advanced technologies. In addition, the country lacks a culture of scientific or technological research. Nicaragua’s scientific-technological indicators show that total research and development (R&D) investment in this sector stands at just 0.12% of gross domestic product (GDP)—far below Latin America averages (0.52% for R&D).

3. Obstacles to the coordination of supply and demand

- 1.17 **Need for a framework of action and incentives.** The NIS is the vehicle whereby science and technology participate in productive-sector development. Innovation was not viable in such small and incipient markets as Nicaragua’s, with its traditional business routines and habits, and a protectionist commercial framework inhibiting competition. These market and institutional weaknesses held back economic progress. Structural reforms, export promotion and economic openness are now removing many of the constraints on fiscal and monetary policy, but greater coordination/management of technological change is required. Nicaragua’s NIS, albeit incipient, does have the four essential bases for growth: educational, productive and financial sectors, and two specialized bodies, CONICYT and DTNM, all of which are being strengthened. A key task is to link these pillars of development to enable them to unleash the synergy between them.

- 1.18 **CONICYT needs strengthening to coordinate and construct the NIS.** CONICYT has only been operating for a short time, and has not fulfilled its brief of coordinating technology users and providers, or of providing guidance in satisfying the country's science and technology needs. Nicaragua's NIS has therefore been a set of loosely connected and weakly communicated agents. **The DTNM will be a key support for CONICYT.** The DTNM does not have the capacity to tackle multiple quality-regulation tasks, and it has shortcomings in: (i) resources to respond to ever-increasing enquiries about standards, accreditation and quality certification; (ii) planning to tackle bureaucratic aspects; (iii) inspection-collaboration with ministries or standard-issuing bodies; (iv) qualified laboratories to undertake reliable measurements; and (v) capacity to convene and persuade, with a view to creating a climate that fosters sectoral consensus in developing standards.

E. The Bank's strategy in Nicaragua

- 1.19 The Bank's objective in the country is to support the ERRP, and this project is a key instrument for fulfilling this strategy. With the leading role assigned to SMEs, access to financing, increased technical support services, and export facilitation, the operation is consistent with the strategy and with the Bank's Eighth General Replenishment.

F. Government strategy

- 1.20 The MIFIC, together with the National Institute for the Small and Medium-sized Enterprise (INPYME) with its "New policy and support strategy for SMEs", and the ERRP, all insist on the use of new technologies as the way to increase productivity. The national competitiveness program (NCP)—attached to the office of the Vice-President of the Republic—is promoting productive linkages. The NCP aims to increase private-sector investment and is planning an agreement in the Agenda of the Presidents of Central America. Apart from this, the World Bank will be financing a pilot scheme for SME business development centers in coordination with the project team. The current project complements these actions by facilitating tools, linkages and coordination amongst the actors involved.

G. The Bank's experience with related projects in Nicaragua

- 1.21 The Multilateral Investment Fund (MIF) has approved two similar projects: the "Quality 2000-2003" project in conjunction with the Nicaraguan Chamber of Industry (CADIN), is expected to help 450 firms increase their awareness of quality issues, national support services, implementation of quality systems and transfer of knowledge on quality—in particular the ISO 9000 and HACCP systems (hazard analysis critical control point evaluation). This program has made a successful initial execution and is remedying a number of SME weaknesses (lack of a quality culture). These activities do not include investments in the equipment needed for

the ISO 9000 and HACCP systems, however, which could be procured through the present project.

- 1.22 The second MIF project is “Promotion of Sustainable Business Services for Microenterprise and Small and Medium-Sized Enterprise (MSME)”, to be executed by the Nicaraguan Development Institute (INDE). This project will provide supply and demand incentives for non-financial services, in particular training and technical assistance. Technology laboratories and universities can be considered as part of service supply, and MSMEs could use their technical assistance vouchers to pay for services relating to production, technological innovation, quality and standard compliance, thereby complementing the present project.

II. OBJECTIVES AND DESCRIPTION OF THE PROJECT

A. Project objectives

- 2.1 The project's general objective is to lay the foundations for a dynamic Nicaraguan NIS, promoting technological innovation in SMEs. Technological innovation is interpreted in a broad sense to include the use of basic, pre-existing technologies that are not widespread in Nicaragua's economy. This will provide the basis for an action framework (enabling conditions) to facilitate technological innovations aimed at enhancing SME productivity. The project's specific objectives are: (i) to expand/deepen the market for technology services; (ii) to trial prototype organizational and financial arrangements that facilitate technological innovations, within a controlled sphere of action; and (iii) to strengthen the capacities of bodies that coordinate supply and demand among technology services.

B. Expected outcomes at the end of the project

- 2.2 Expected final outcomes include: (i) a clear institutional strategy and the means to make the project sustainable (investment plan); (ii) minimal State participation as facilitator and regulator; (iii) greater awareness of the benefits and applicability of new technologies; (iv) a tripartite sustainability scheme: alliance with SMEs, a on-merit claim on the State budget (given the resulting benefits), and an institutional proposal for capturing funds from a variety of sources; (v) a larger number of SMEs capable of achieving high long-run quality and productivity levels; and (vi) technological laboratories capable of forging links with SMEs and providing technological services and development to them.

C. The project will benefit from the flexible innovation loan modality

- 2.3 This project qualifies as an innovation loan. Document GN-2085-1 supports experimental projects (for amounts up to US\$10 million) that increase institutional capacity to carry out more ambitious programs, gain valuable institutional experience, and demonstrate the potential of a specific method for overcoming a development obstacle. Specifically, with this project:
- a. **Knowledge about a new institutional experience will be gained.** The project will pilot-test administrative outsourcing for channeling finance to SMEs (paragraph 2.7). The pilot plan will make it possible to learn about this method, and a new institutional experience will thus be gained. Another institutional experience will be gained through the technological facilitators network (paragraph 2.14), which is expected to be implemented for the first time. In addition, a sustainable financing framework will be agreed and proposed. Also, for the first time, training will be provided in a method for analyzing and financing small-scale technological projects that increase SME productivity

(paragraph 2.7). This will also be useful for many other financial institutions, thereby generating positive institutional externalities.

- b. **Flexibility is added to the design.** The various methods for providing services and disseminating information on technological change related to the innovations mentioned in (a), will provide CONICYT with the feedback it needs to help new designs to emerge that were unforeseeable during the preparation stage.
- c. **A new framework of institutional action will be tested.** The use of science and technology to obtain a major increase in SME productivity and competitiveness is a new idea in Nicaragua's economic development.
- d. **Mechanisms will be tested for using appropriate information and communication technologies,** aimed at minimizing information asymmetries, in accordance with the specific needs of SMEs and the country at large.

D. Design and cost of the project

- 2.4 The project components include activities of human resource formation, and contracting services closely integrated into the different components to ensure sustainability.

Table 2.1: Summary of activities to remove obstacles

Obstacles detected that inhibit use of technologies	Activities proposed to remove obstacles
Component 1: Pilot schemes to remove supply and demand obstacles	
<ul style="list-style-type: none"> Lack of incentives and funding of demand for technology services 	<ul style="list-style-type: none"> Matching grant fund to support demand for services Pilot technology facilitator (TF) network of high quality and low-cost
<ul style="list-style-type: none"> Shortcomings in the provision of laboratory and consulting services 	<ul style="list-style-type: none"> Matching grant fund to support technical service providers
<ul style="list-style-type: none"> Low-skilled human capital 	<ul style="list-style-type: none"> Training plan (short courses and workshops) Training activities included in matching grant projects
Component 2: Pilot schemes to improve coordination	
<ul style="list-style-type: none"> Obstacles to coordination between supply and demand 	<ul style="list-style-type: none"> Strengthening of CONICYT as coordinator Pilot technology facilitator (TF) network Long-term NIS development strategy Monitoring and evaluation plan
<ul style="list-style-type: none"> Inadequate access to technological information 	<ul style="list-style-type: none"> Pilot network of facilitators and TF centers Marketing plan to promote the project

**1. Component 1. Pilot schemes to remove obstacles to supply and demand:
Fund for matching grants and financial outsourcing (US\$3,050,000)**

- 2.5 This component will pilot-test new mechanisms to deliver matching grants for technology innovation projects in SMEs, as well as projects to strengthen technology services. In principle, microenterprises and large companies will be excluded unless they are part of a production chain. This financing mechanism is expected: (i) to stimulate and respond to the demand for technological innovation; (ii) to improve the supply of services; (iii) to promote joint SME-university projects; and (iv) to contribute to greater export value-added in the longer run.

**a. Subcomponent 1.1. Grants aimed at demand (Grant:
US\$2,100,000; Consulting services: US\$150,000)**

- 2.6 This subcomponent will set up a matching grant and will run a pilot scheme to outsource the promotion, pre-evaluation and supervision of technological innovation projects in SMEs, to local private operators, including both for-profit and non-profit entities², except for disbursements, which will be handled by a project coordinating unit. The advantage of outsourcing is that: (i) it minimizes political influences; (ii) it streamlines the processing of funding applications; (iii) it capitalizes on experience accumulated in bodies that already have knowledge of SMEs and their financial situation; and (iv) it will help to specify the design of a proposal for a “Nicaraguan Technological Innovation Fund”, which is envisaged as a final outcome of the project (see paragraph 2.12). To identify and assess their technology needs and determine their cost more quickly, technology facilitators as described in subcomponent 2.3 (paragraph 2.14) will visit the companies to provide guidance.
- 2.7 The matching grant will finance up to 60% of the cost of each project, with the SMEs themselves providing a minimum of 40% of the total cost. The grant will finance: (i) payments to consultants (e.g. local professionals and international experts in the industry in which the SME operates); (ii) services provided by technology laboratories (e.g. quality controls and new product development); (iii) training; (iv) specialized equipment and its maintenance (amounting to no more than 40% of the project); and (v) activities to promote exports (or imports) of products covered by the project. Such activities would include market research and analysis; strategic planning for market penetration, study tours by entrepreneurs; professional services for setting up operations in foreign markets; obtaining patents and trademarks, and royalty agreements relating to the formation of joint ventures; the design and production of leaflets, sales points and other promotional tools such as videos and specialized graphic design; and dispatch of samples to new clients. Innovative projects that prove successful after being funded under the Matching Grant will be eligible for financing a second time from the Fund in order to gain

² The test will focus on two or three basic sectors with obvious potential for growth.

support in formalizing and justifying a proposal for financing to the banks to improve trade.

b. Subcomponent 1.2. Grants aimed at supply (US\$800,000)

- 2.8 To avoid bottlenecks that would put pressure on demand as a result of subcomponent 1.1, this subcomponent will provide resources for efficiently adjusting supply. This subcomponent will finance projects with technology service laboratories aimed at strengthening their service supply, providing information on new techniques, and technical support as well as university departments geared to technical consulting services for the private sector. A competitive process will be used to select a single local organization with which to outsource the administration of the subcomponent—given the small size of projects and the need to check all applications comparatively. Project funds will finance up to 80% of the cost of laboratory equipment and up to 60% of the cost of training the professionals that operate these laboratories or similar services. Preference will be given to projects with greatest potential for supporting exports, and to those projects where the potential customers (SMEs) clearly intend to use the new services. About five technology laboratories are expected to participate (e.g. laboratories working in marine biotechnology, and in water and food technology), each with a project costing on average US\$90,000.

2. Component 2. Strengthening of national innovation system, NIS (US\$2,992,000)

- 2.9 NIS actors will be strengthened and new models for coordinating them will be tested, aiming the supply of technology services at SMEs, and, by extension, also strengthening technology service markets.

a. Subcomponent 2.1. Strengthening of CONICYT and DTNM

- 2.10 This subcomponent will finance: (i) adaptation of the structure of CONICYT to the country's needs; (ii) design of innovation policies consistent with national development objectives; and (iii) incentives for collaboration between loosely linked NIS stakeholders. Funding will also be provided for designing a sustainable action plan, as well as financing to ensure CONICYT sustainability. The following documents will be produced for this purpose: (i) a strategic plan for CONICYT development; (ii) a five-year strategy for science, technology and innovation; and (iii) a study to set up a *Nicaraguan Technological Innovation Fund* (FONITEC), consistent with Bank policies and those of the country at large. FONITEC would be a mechanism within CONICYT to obtain financial resources and pay competitive professional fees. The funds thus obtained will give sustainability to the project. Funding will also be provided for a coordinating unit (CU) to execute the project, and this would be gradually incorporated with funding from the State budget, into CONICYT as its executive secretariat during project implementation.

- 2.11 Given the close ties and complementary relationship that exist between CONICYT and DTNM, basic DTNM strengthening will be financed for the following: (i) devising and disseminating quality standards and metrology services; (ii) coordinating the standardization measures information system; (iii) reviewing trial-and-error accreditation rules and updating the standards bank; (iv) preparing and implementing an intensive staff training program; and (v) modernizing the metrology laboratory.
- 2.12 Project funds will also be used to finance the design and implementation of a marketing plan in order to: (i) promote the project and give orientation to its beneficiaries and the parties involved in it; (ii) disseminate information on how to benefit from the opportunities existing in the science and technology sector generally; and (iii) carry out studies to facilitate the marketing (general framework) of the new products and services resulting from the project.

b. Subcomponent 2.2. Supervision, monitoring and evaluation system

- 2.13 Using the operating regulations (OR) as a base, funding will be provided for the structures needed to monitor all project components adequately. This will include equipment to set up a monitoring and evaluation system that will facilitate the project's interim evaluation (at months 12 and 18) and final evaluation (at month 29)—as well as post-project evaluations in the science and technology field.

c. Subcomponent 2.3. Pilot technology facilitators network

- 2.14 On the basis of successful local experiences, a network of intermediaries between SMEs and technology providers will be created. These "technology facilitators" (TFs) will facilitate interaction among NIS actors and promote information exchange. TFs will provide rapid basic diagnosis, identify opportunities and give guidance in developing business plans when applying for matching grant funding.
- 2.15 TFs will operate from "technology facilitation centers" (TFCs), to be located in places that provide training activities and access for entrepreneurs to relevant information resources, including Internet connections. Tailor-made content and applications relevant to SMEs will be developed in collaboration with specialized local and international organizations. Three TFCs will be set up to serve the nodes of the network, each providing for different regions of the country. Each TFC will have two highly trained staff—a technology expert and a marketing specialist—supported by a technical assistant.
- 2.16 TFC equipment will consist of computers, fax, Internet connection, furniture, stationery, and expenses relating to telephone links, which will be covered by project funding. TF salaries will also be financed by the project, but not those of the assistants, nor the rental provided by communities housing TFCs. TFs will be

supported by relevant content on the Internet, which will complement traditional information transmission media (libraries, radio).

Table 2.2. Project budget (US\$000)

	IDB	Local	Total	%
1. Component 1. Pilot financial outsourcing scheme	3,050	1,600	4,650	50
1.1 Demand financing	2,100	1,400	3,500	
1.2 Supply financing	800	200	1,000	
1.3 Consulting services	150	0	150	
2. Component 2. NIS strengthening	2,992	830	3,822	40
2.1 Coordinating unit	288	402	690	
2.2 Institutional strengthening plan	979		979	
2.3 DTNM technical support	450	285	735	
2.4 Monitoring and evaluation	300	0	300	
2.5 Equipment	145	0	145	
2.6 Technological facilitators network	730	143	873	
2.7 Audits	100	0	100	
3. Not specifically allocated	564	200	764	8
3.1 Contingencies (10%)	564	200	764	
Subtotal	6,606	2,630	9,236	
4. Financial expenses	184	42	226	2
4.1 Inspection and supervision	67	0	67	
4.2 Commitment fee	0	42	42	
4.3 Interest	117	0	117	
TOTAL	6,790	2,672	9,462	100
	73%	27%	100%	

III. PROJECT EXECUTION

- 3.1 The borrower will be the Republic of Nicaragua and the project' executing agency will be MIFIC, acting through CONICYT. A coordinating unit attached to CONICYT will be set up to implement the project.
- 3.2 A Technical Advisory Committee (TAC) will be established so that the project can be coordinated more easily with other programs and policies. This Committee will be an internal authority within the MIFIC and its main purpose will be to coordinate and supervise the project on the basis of reports that the TAC may request from time to time from the Coordinating Unit on the accomplishments of the project and the extent to which its objectives have been fulfilled.
- 3.3 The responsibilities of the CU will include the following: (i) to open specific and separate bank accounts for the loan proceeds and local counterpart funds; (ii) to prepare and present, to the Bank's satisfaction, disbursement requests and justification for the use of funds, together with six-monthly reports on the use of the revolving fund; (iii) to develop and implement suitable accounting, financial and internal control systems for managing program funds, including supervising the quality of investments and advisory assistance covered under the project; (iv) to organize the accounting system so as to identify the sources and uses of project funds, to provide the documentation needed to verify transactions and facilitate timely preparation of consolidated financial statements for the program; (v) to maintain an adequate file of supporting documentation for disbursement; and (vi) to prepare and present annual financial statements for the project, duly certified by external auditors.
- 3.4 The CU will consist of a coordinator; a planning and policies chief; an officer in charge of control and monitoring; an officer in charge of components 1 and 2; an administrator/accountant, and an assistant. Wages for support staff, secretary and concierge will be financed out of the local contribution. The CU team will gradually be incorporated into the CONICYT executive secretariat during project execution, in accordance with a plan established with the government.
- 3.5 There are seven key players involved in project execution: the CU, CONICYT, DTNM, SMEs, service providers, private operators and technology facilitators (TFs). In component 1 (Matching Grant), the SMEs will submit their request to the private operators, which will act under criteria established in the operating regulations recommending approval of projects that are viable. The CU will make disbursements to SMEs under the terms agreed in the corresponding contracts. A similar method for awarding contracts to service providers will be used.
- 3.6 In component 2 (NIS strengthening), the CU will hire consulting services and procure equipment for strengthening CONICYT and DTNM. The technological

facilitators will act as information and knowledge intermediaries between the SMEs, CONICYT and the service providers.

- 3.7 **Revolving fund.** In view of the nature of the project, a revolving fund will be established for up to 10% of the loan proceeds. The CU will keep specific bank accounts in the name of the project for each financing source, and will provide the Bank with six-monthly statements of the revolving fund, within 60 days following conclusion of the semester ending June and December each year.
- 3.8 **Operating Regulations.** Project execution will be governed by a single set of Operating Regulations (OR). The particulars of the OR and the procedures entailed have already been agreed on between the executing agency and the Bank. The OR will summarize the conceptualization of the project and refer to all components, and it will also specify criteria for use of the funds. In order to assure the impact of the project, a table setting out the time sequencing of critical activities will be agreed upon (critical path for implementation of project components); this will be included in the OR. Interim evaluations will review compliance with this table. To streamline the start of project execution, preparation of the OR will be funded from the proceeds of the technical cooperation ATN/SF-6900-NI.
- 3.9 The functions of the CU will be governed by the OR, which will contain: (i) definitions; (ii) objectives; (iii) organizational structures; (iv) description of posts and requirements to occupy them; (v) description of data to be processed and the processing method to be used (software), as well as estimated times for information flows; and (vi) procurement and contracting procedures. The OR will also regulate (i) the provision of financing (Component 1) and (ii) TF activities (Component 2). **Creating the CU and physically establishing the Unit with a minimum of staff will be a condition precedent to disbursement.**

**1. Component 1. Pilot schemes to remove obstacles to supply and demand:
Fund for Matching Grants and Financial Outsourcing**

- 3.10 For execution of this component two or three private-sector profit or nonprofit operators will be competitively selected to perform financial intermediation services (excluding disbursements). Applicant SMEs will be required to prepare a technological innovation plan (TIP) which will be standardized and to propose a set of activities aimed at fulfilling the technological innovation goal. Once pre-approval for the TIP has been given by these private operators, the CU will verify that pre-requirements have been complied with, and then make disbursements directly to beneficiaries.
- 3.11 The criteria for selecting the private operators will be determined on the basis of: (i) experience with SMEs; (ii) geographical and sectoral representativeness; (iii) track record in working methods for managing the client service platform, promotion of services and supervision of project compliance; (iv) human resource

organization and profile; (v) capacity to systemize aspects of project preparation and monitoring; and (vi) capacity to evaluate business plans and clients' financial capacity.

- 3.12 This process will be governed by the *Matching Grants Manual for technology services supply and demand*, contained in the OR. Definition of criteria for competitively selecting the private operators to be used in outsourcing, the method of evaluating bids, and the draft contract to be signed, and the terms of reference for the training that the organization will obtain, will be the responsibility of the consultant soon to be contracted using funds from ATN/6900-NI. Later, the consultant will undertake a 24-month "in-service support" assignment financed with the loan proceeds. The private operators will not manage the loan proceeds, and will be confined to intermediation and supporting the work of the CU.
- 3.13 The OR will therefore contain two manuals associated with this component: a manual for the demand side and another for the supply side. Each will contain the following information: (i) definitions; (ii) objectives; (iii) eligibility criteria; (iv) fundable categories; maximum and minimum amounts; (v) description of content to be included in business plans to be presented by the applicant; (vi) criteria for technical, economic, financial and environmental evaluations; (vii) procedures for goods and/or services procurement; and (viii) draft contract between the intermediary organization and the beneficiary entrepreneur or institution, containing all requisite clauses.
- 3.14 On the demand side, the manual will contain: (i) a description of the SME contribution requirement, namely 40% of total cost; (ii) reports documenting lessons learned; and (iii) criteria for supervising the different types of eligible projects.
- 3.15 In addition, the manual will contain payment provisions for services provided by the private operators. Contracts entered into with private operators will have a two-pronged payment mechanism: a basic payment followed by an additional one linked to the results of the private operators' work. The CU will disburse agreed funds to beneficiaries and will verify ex-post that the intermediary organizations (i.e. the private operators) complied with rules on *matching grants for supply of and demand for technical services*, as set out in the OR and the manuals. With the private operators, the CU will make an initial basic payment, and this will be followed by the additional incentive payment, subject to verification of, and depending on the results.
- 3.16 The manual for the supply side will contain: (i) a description of the applicant's minimum 20% contribution, and eligibility criteria for this contribution; (ii) description of the rules for issuing national six-monthly invitations to submit requests for financing; and (iii) commitments on institutional re-engineering to

facilitate the emergence of client services with competitive prices and quality standards, and which meet “just-in-time” delivery criteria.

- 3.17 **Evaluations of the components:** three evaluations will be performed on the basis of the indicators set out in the logical framework and Operating Regulations evaluation matrix. Of particular importance will be the interim evaluations (after 18 months) since the project is expected to be mature enough by then to permit a review or rectify previous assessments. The criteria are described below.
- 3.18 **Criteria for evaluating the performance of Subcomponent 1.1 “Grants aimed at demand” 18 months after implementation. Case 1:** One of the private operators commits $\geq 60\%$ of the total amount allocated to the subcomponent. Action: select this one alone. **Case 2:** the amount committed, \$X, is between $60\% \geq X \geq 25\%$ of the total, but the type of enterprise and projects, level of sophistication, development potential and risk-benefit index clearly exceed the pre-established minima. Action: more than one modality or type of organization can be chosen.
- 3.19 **Criteria for evaluating the performance of Subcomponent 1.2 “Grants aimed at supply” 18 months after implementation:** the outsourced organization will be evaluated in terms of: (i) project quality; (ii) processing efficiency (times and costs); (iii) opportunity costs relating to time spent on procedural matters; and (iv) effectiveness of the contest to award funding. Providers (applicants) will be assessed in terms of: (i) the quality of services provided before and after intervention; and (ii) the level of satisfaction among SMEs (the clients).

2. Component 2. Pilot plans to enhance the national innovation system and improve coordination between supply and demand

a. Subcomponent 2.1. Institutional strengthening of CONICYT and DTNM

- 3.20 International and national consultants will be hired for the workshops to disseminate the *CONICYT strategic development plan and the Five-year science, technology and innovation strategy*. In addition, stakeholders and CONICYT staff will visit institutions with similar experiences in Central and South America.
- 3.21 As for DTNM strengthening, an agreement will be signed with counterparts in Mexico (it has already been working with them) to address DTNM organizational and administrative needs on standards and metrology. Also envisaged is modernization of the metrology laboratory and other institutions run by DTNM, along with funding for a staff training plan, both in this office and in the ministries responsible for implementing MIFIC regulations. The training plan will require the Bank’s no-objection and will be started within three months following the signing of the loan contract.

- 3.22 The project marketing plan will be prepared by specialized consulting services. Payments will be made against services provided and expenses incurred, duly audited.
- 3.23 **Criteria for evaluating Subcomponent 2.1, 18 months after implementation.** In its role as executor, CONICYT will be assessed on: (i) its supervision and evaluation capacity; (ii) the effectiveness and utility of the information required for decision-making; (iii) its potential for supervising the matching grant funding (commitments for at least 40% of anticipated demand); and (iv) the quality of the design and the potential benefits of the proposal for FONITEC.
- 3.24 A high-level meeting will be called to verify the presence of an agreement on the degree of commitment, including national budget, to the sustainability of CONICYT and the establishment of FONITEC.
- 3.25 As the governing body for science and technology, CONICYT will be evaluated in terms of: (i) the degree of acceptance of its leadership by stakeholders; (ii) political support for its restructuring proposal and five-year strategic plan; (iii) the budgetary increase allocated to it by government; (iv) the degree of public/private collaboration in jointly financing the incorporation of CU consultants into the official CONICYT organization structure; and (v) recognition earned from counterpart regional organizations.
- 3.26 DTNM will be verified for the following: (i) that at least 80% of the rules needed for the economic sectors covered by the project have been produced, along with at least 40% of all the rules applicable to other sectors; and (ii) that 80% of the legal instrumentation and equipment needed to achieve quality certification and compliance with the rules are operational.

b. Subcomponent 2.2. Supervision, monitoring, evaluation and external audit system

- 3.27 A control and monitoring expert will be contracted to coordinate with the CU coordinator and with the consulting firm responsible for the midterm and final evaluation. The contracting of external audit services will abide by procedures agreed with the Bank, and will be financed with funds provided by the Bank.
- 3.28 **Criteria for evaluating the monitoring system.** The following aspects will be assessed: (i) the reliability, timeliness and frequency of information generated and its usefulness in program execution; (ii) the availability of information in traditional and electronic formats; and (iii) the “friendliness” of the system.

c. Subcomponent 2.3. Pilot technology facilitators network

- 3.29 The technology facilitation centers (TFCs) will be awarded through a competitive process to: SME organizations, municipalities, technical schools, universities and

other organizations satisfying requirements to be established in the ground rules. These organizations will present a business plan guaranteeing sustainability of the center. The TFCs and their administration will be supervised by the coordinating unit, which will provide content and training to the TFC adjudicating bodies. The CU will set up coordination, communication and organization for workshops to disseminate lessons learned and best practices amongst the TFCs that are established. TFC management will be governed by rules contained in the overall operating regulation. At the end of the project, these TFCs should be able at least to cover their operating costs. Once their potential profitability has been demonstrated, a privatization program will be designed for some or all of them.

- 3.30 Training the facilitators will be carried out by specialized consultants. The private operators will also receive training in the promotion, evaluation and approval of matching grants, from a consultant specialized in this form of financing. It should be noted that this training will be short and relatively easy, since the individuals and institutions eligible to become facilitators need to have solid experience in similar topics.
- 3.31 With a view to facilitating new learning, an international firm or institution of renowned research caliber will be contracted, using project funds. This institution will identify innovative methods and processes to strengthen the development of low-income and/or remote communities with poor access to information and modern communication channels. Researchers from this firm or institution will collaborate with the CU, the TFCs, SME associations, service providers and universities, in order to catalyze sustainable social changes that respond to local needs.
- 3.32 **Criteria for evaluating the facilitators network.** The usefulness of the following experiences will be evaluated: (i) the technology facilitation centers; (ii) TF functions and remuneration; (iii) the effectiveness of different types of TF (an expert in the dairy products subsector, for example, vs. a professional with a university degree or a researcher without great industrial experience, trained to be a TF); and (iv) the use of tailor-made content and applications. "Service schedules" will be used both in paper and electronic form to record each of the services provided under the different modalities. At 18 months, simple surveys of user (SME) experiences will be evaluated.

A. Execution period

- 3.33 Project execution is expected to last 30 months. This projection is based on the following characteristics of the project design: (i) An efficient CU will be put together, through a competitive process, to ensure targets are met on time; (ii) participation by the outsourced private operators in providing financial services to SMEs and service providers, will streamline the processing of applications, given the familiarity and experience these organizations have with similar activities;

(iii) the payment structure (consisting of a basic sum plus an additional results-based payment), for both the private operators and the TFs, acts as an incentive for them to fulfil their contracts by or before the established deadlines, and with the desired quality; (iv) the OR, preparation of which is financed with proceeds from ATN/SF-6900, will be ready prior to approval of the loan by the Bank, and it will only need to be put into operation; (v) before signing the contract with the Bank, and through the training program for C and D group countries, training will be given on: logical framework; goods and services procurement and contracting; control, monitoring and evaluation; (vi) the size of the project is quite small—it covers less than 5% of SME demand for technological innovation; and (vii) it will have a well-defined market before signing the contract with the Bank. Thanks to this, prior to signing the contract, and using funds from the ongoing technical cooperation, a series of workshops will be held to start building awareness and interest in the project. Subsequently, with the promotion, dissemination and social marketing subcomponent, demand for the technology benefits will expand still further in the short run in terms of how to gain access to project support and resources. The Government of Nicaragua has been steadily raising the priority it attaches to science and technology, and it plans to raise this still further. This sense of priority and urgency will exert pressure for speedy execution.

3.34 The expected disbursement timetable is shown below:

Table 3.1 Disbursement timetable

Source	Year 1	Year 2	Year 3	Total	%
IDB	2,400	3,500	890	6,790	72%
Local	626	1,668	378	2,672	28%
Total	3,026	5,168	1,268	9,462	100%
%	32%	55%	13%	100%	

B. Procurement plan

3.35 The procurement of goods and related services, and the hiring of consulting services, will be carried out in accordance with the corresponding Bank policies and procedures. The project does involve civil works. International competitive bidding will be required for: (i) goods and related services for amounts greater than or equal to US\$250,000; and (ii) consulting services for more than US\$200,000. The procurement of goods and related services and the hiring of consulting services for smaller amounts will be governed, in principle, by provisions contained in national legislation.

C. Evaluation and external audit

- 3.36 The project stresses the evaluation of activities and the achievement of indicators that are verifiable both quantitatively and qualitatively. To ensure systematic monitoring, this responsibility will be assigned to a CU staff member. The operating regulations will contain a detailed monitoring and evaluation criteria, together with procedures to be applied.
- 3.37 Three evaluations will be carried out during the lifetime of the project, 12, 18, and 29 months after the operation comes into effect. Each evaluation will involve participation by authorities from the Nicaraguan government, the Bank, SMEs, universities and other stakeholders. The interim evaluations will allow adjustments to be made to the project, where necessary. The logical framework contains details of indicators by component.

D. Supervision

- 3.38 The Bank's country office in Nicaragua will be responsible for supervising project execution.

IV. TECHNICAL VIABILITY, BENEFITS AND RISKS

A. Institutional viability

- 4.1 The Organization, Competition and Executive Power Procedures Act, approved by the National Assembly in 1998, gives MIFIC the mission to “promote productivity, efficiency and competitiveness in intersector chains and clusters, as well as in industry and other non-agricultural sectors, based on technology development and transfer, and on management training with a focus on small and medium-sized enterprises.”
- 4.2 In carrying out this legal mandate, the MIFIC has developed a “Strategy and policy for development of the SME sector.” This strategy gives priority to establishing an institutional framework for competitive development in SME sectors where the country has comparative and competitive advantages that enable it to compete in the global marketplace. The enhanced poverty reduction strategy (ERRP) is an additional national priority that gives greater viability to the project. As discussed in chapter I, SMEs are a fundamental pillar of the ERRP. Thus, the technological support provided to SMEs through this project is crucial for fulfilling the ERRP.
- 4.3 Finally, CONICYT’s lack of experience will be amply compensated by the structure and composition of the CU, as well as the anticipated technical assistance. The experience and academic requirements of the consultants making up the CU will be of a suitable caliber to manage and promote the project.

B. Economic viability and sustainability of the project

- 4.4 **Economic viability.** Significant changes will be seen, as financing and information shortfalls are overcome: (i) entrepreneurs will recognize the local potential of technical services; (ii) the supply of technological knowledge will systematically converge with the demand for it; (iii) better production and technical assistance alternatives will emerge, on a broader and more frequent scale, and at reasonable cost; and (iv) meetings between national and international actors linked to the introduction or adaptation of technologies, goods or services, can be expected to speed up economic growth.
- 4.5 These actions will make coordinating demand more viable, as technology transfers gradually increase. At the same time, access to technical support will be organized so as to make transactions between supply and demand smoother, easier, and thus less costly. In addition, opportunities provided by the free trade agreements that the current government has signed and is in the process of implementing offer major incentives. This development of service markets will create a virtuous circle like any other market. The logical framework and interim evaluations, the terms of

which have already been agreed on between the executing agency and the Bank, will make it possible to verify these expectations.

- 4.6 **Sustainability of the project.** The financial viability of the program is backed by the increasing priority the government has been attaching to the ERRP, for which this project is instrumental. In addition, the global marketplace is eliciting increasing participation by SMEs in international trade. For that reason, there has been a considerable increase in actions and budgetary allocations aimed at expanding DTNM and CONICYT. On the other hand, surveys carried out while preparing this project reveal a clear willingness among SMEs to contribute with their own funds to improving production practices (a contribution of 40% from SMEs is required for financing innovations and 20% from service providers).
- 4.7 The project envisages the design of a sustainable financing proposal through FONITEC (Component 2), as a final outcome of the project. Apart from this, the design of the technology facilitation system includes mechanisms for identifying possible alternatives for transferring coordination of the system to some other more permanent institution (privatization). It is also anticipated that applicants for matching grants will submit a business plan showing incomes generated being reinvested in the departments and facilities used to provide services.

C. Environmental viability

- 4.8 The proposed project does not involve financing new buildings, and execution is not expected to cause negative environmental impacts. The operating regulations (Component 1, Matching Grant) will include specific rules to ensure that the subprojects financed do not cause environmental damage. In particular, it will be a pre-requisite for participating SMEs to be compliant with national environmental regulations, or be in the process of compliance. Apart from this, the TFs will be trained to identify possible environmental impacts in the activities carried out by the enterprises included in the project. In addition, the TFCs will contain electronic information on clean technologies, together with procedures to recognize harmful environmental impacts and mitigate them.

D. Social equity and poverty reduction classification

- 4.9 Although the project is consistent with the Nicaraguan government's enhanced poverty reduction strategy, it does not qualify as a poverty-targeted investment (PTI) or as a social-equity enhancing project (SEQ), as described in the indicative goals mandated by the Bank's Eighth Replenishment (document AB-1704). Considering that SMEs are the main beneficiaries of this project and are clearly identified as key players in the Nicaraguan government's enhanced poverty reduction strategy (ERRP), the project is expected to benefit social groups of limited economic resources indirectly. Funding will be included for a study of the

impact of project activities on these low-income groups, particularly in terms of the emergence of new projects to generate employment and/or raise income.

E. Benefits

- 4.10 A significant achievement will be to strengthen CONICYT in order to facilitate a streamlined mechanism for financing technological innovation and to be capable of developing far-reaching strategic plans. This will lay the foundations for overcoming three major concurrent bottlenecks that restrict the potential of SMEs to integrate into the global economy: financing, information and timely technical support for technological innovation.
- 4.11 The project will also help develop more effective links between specialized technology centers and their potential users. The capacity of such centers will be used to enhance Nicaragua's productive system and to expand the market for technology services. The project will also facilitate collective learning on the uses of science and technology, which will lead to better coordination of interests and economic exchange between the different actors in the national innovation system.

F. Risks

- 4.12 The project has one main risk: that CONICYT fails to obtain a permanent budgetary funding to maintain an effective organization incorporating CU staff, which it needs to provide leadership in managing national technological change.
- 4.13 This risk can be overcome, however, because: (i) the mandate given to CONICYT to carry out its brief is overwhelming; (ii) the support this project provides for disseminating (through social marketing and lobbying) the benefits of its functions and the lessons learned will be very well targeted, and will attract political allies, clients and professional followers; (iii) FONITEC, the fund-capture mechanism to be created at the end of the project, will garner significant resources; and (iv) the financing facilities (matching grants) together with promotion and closer relations with SMEs (facilitators network), will turn the latter and other new stakeholders into key interest groups. Lastly, and possibly as or even more importantly, CONICYT and the **productivity/income-expansion** that result from its actions are crucial for fulfilling the *strengthened poverty reduction strategy*. For that reason, the national budget is expected to continue contributing to its sustainability.

PROJECT TO SUPPORT TECHNOLOGICAL INNOVATION IN NICARAGUA (NI-0147)

LOGICAL FRAMEWORK

Narrative summary	Performance indicator	Means of verification	Assumptions
Incomes of SMEs	SME incomes rise by at least 10% with respect to base year	Registers of MIFIC, Office of Statistics, SME Association, etc. Specialized survey	Macroeconomic conditions remain
Introduce technological innovations in production processes.	<ol style="list-style-type: none"> 1. New products introduced or developed 2. Access to new markets 3. Best administrative practices using information systems 4. Employee/sales ratio or hours of work/units produced ratio shows improvement 5. Higher levels of quality (ISO certification). 	<ol style="list-style-type: none"> 1. Executing agency MIS. 2. Two interim evaluations (months 12 and 18) and final evaluation by specialized consultants, using program resources. This includes an opinion survey. The quality of the interim and final evaluations is guaranteed by the Nicaraguan Government and by the Bank. 	The Nicaraguan Government supports development of a new stage of the program based on lessons learned.
Pilot schemes for delivering services to finance technological innovation. 1.1. Grants aimed at demand management services, delivered.	<ol style="list-style-type: none"> 1. By month 8, 2 Private Operators selected and trained are providing outsourcing services 2. In month 12 of the program, 10 matching Grants (MGs) delivered to SMEs; in month 18, 40; and in month 29, 60 (cumulative total) in accordance with Regulations 	<ol style="list-style-type: none"> 1. Executing agency MIS. 2. Bank reports. 3. Interim and final evaluations by specialized consultants, using program resources. 	The regulatory framework for intermediate production remains favorable for marketing SME production. SMEs continue participating actively in the program.
1.2. Grants aimed at supply of services, delivered.	<ol style="list-style-type: none"> 1. By month 8, one Private Operator selected, trained, and providing service 2. In month 12 of the program, 2 matching Grants (MGs) delivered to universities and first meeting held. In month 18, a second meeting held and a cumulative total of 6 MGs delivered to universities and 2 to SME organizations in accordance with Operating Regulations. 	<ol style="list-style-type: none"> 1. Executing agency MIS. 2. Bank reports. 3. Interim and final evaluations by specialized consultants, using program resources. 	Universities apply cost recovery policy

Narrative summary	Performance indicator	Means of verification	Assumptions
<p>Pilot schemes to improve between supply and demand for services, executed.</p> <p>2.1. Institutional strengthening CONICYT and DTNM, carried out.</p>	<ol style="list-style-type: none"> 18 months into the program, 15 technical/administrative courses and/or workshops held for staff at DTNM, CONICYT and other related institutions, with a total of 20 by month 24. 18 months into the program, 8 foreign internships undertaken. 12 months into the program, the Metrology Laboratory, owned by DTNM, operating and arranging accreditation. By 24 months, accreditation obtained. After 12 months of the program, CONICYT has a new organizational structure approved by the Nicaraguan Government and the Bank; by 24 months this is implemented with suitable staff. After 24 months, CONICYT has a strategic plan for the next 5 years, approved by Nicaraguan Government and the Bank. 18 months after the start of the program, the marketing plan is 70% advanced, and by 24 months, 100%. At 29 months, the plan is evaluated. After 12 months of the program there is a draft plan for the innovations fund (FONITEC); by 18 months, this is approved by the government and the Bank, and by 24 months it is put into operation. 	<ol style="list-style-type: none"> Executing agency MIS. Bank reports. Interim and final evaluations by specialized consultants, using program resources. 	<p>Foreign accreditation firms are available to rapidly certify the Metrology Laboratory.</p> <p>At least 90% of staff trained by the end of the program to provide services in DTNM.</p> <p>Rapid consensus for approving new organizational structure.</p> <p>CONICYT strategic plan approved within two weeks).</p>

Narrative summary	Performance indicator	Means of verification	Assumptions
2.2. Supervision, monitoring system, being set up.	<ol style="list-style-type: none"> 12 months from the start of the program, CONICYT has a database. 12 months from the start of the program, CONICYT has staff trained in supervision and evaluation. Interim evaluations performed at months 12 and 18 and final evaluation at month 29 after start up of the program, with participation by the Bank and other stakeholders. 	<ol style="list-style-type: none"> Executing agency MIS. Interim and final evaluations by specialized consultants, using program resources. 	At least 90% of staff trained in use continue working in DTNM.
2.3. Pilot technology work, tested.	<ol style="list-style-type: none"> 12 months after start up of the program, 3 technology centers facilitating actions between SNI actors and promoting exchanges of information. 18 months into the program, a budget exists to establish the National Technology Service; by 21 months this is operating, and at 29 months the system is evaluated. 	<ol style="list-style-type: none"> Executing agency MIS. Bank reports. Interim and final evaluations by specialized consultants, using program resources. 	At least 90% of technology facilities the program continue to participate
Pilot schemes to deliver 1.1. Grants aimed at the technology services. Consulting services to train staff in D in administering matching Matching grants without	IDB contribution: \$3,050,000 Local contribution: \$1,600,000 Total: \$4,650,000	<ol style="list-style-type: none"> Program budget. Bank accounting records. Audit reports. 	The Nicaraguan Government makes contribution in timely fashion, in p contracting incremental staff. Sources of credit are available to f procurement of goods and working are accessible to SMEs. SMEs show interest in the program TSPs (universities and others) are participating in the program, and th sufficient number to ensure a bette funds in a competitive fashion.

Narrative summary	Performance indicator	Means of verification	Assumptions
<p>1.2. Grants aimed at the technology services</p> <p>...ting services to train staff in in administering matching ...</p> <p>...atching grants without ...</p> <p>...ting services to create ...</p> <p>...Institutional strengthening andimprove supply and demandservices.</p> <p>2.1. Institutional plan for DTMN</p> <p>...ning plan (courses and/orand internships).</p> <p>...ontacts with training centers hirecluding universities,etc.) and execute plan.</p> <p>...rocurements as programmed:quipment and laboratories. ...nstallation and staff training.</p> <p>...ting services to preparestrategic plan, and carry out/.</p> <p>...ting services to design projectand commercialization plan.</p> <p>2.2. Supervision, monitoring system</p> <p>...ting services to design systemf training.</p> <p>...ting services to perform interim(months 12 and 18) and final(month 29).</p>	<p>IDB contribution: \$ 2,992,000</p> <p>Local contribution: \$ 830,000</p> <p>Total: \$ 3,882,000</p>	<p>1. Program budget.</p> <p>2. Bank accounting records.</p> <p>3. Audit reports.</p>	<p>Communities, municipios and othershow interest in the program, and emaking their installations available ...</p> <p>Bidding processes carried out norm ...</p> <p>The recommendations of the interinare implemented in timely fashion.</p>

Narrative summary	Performance indicator	Means of verification	Assumptions
t 2.3. Pilot technology work lting services to train technology Fs to the TF centers.			

Matrix of Interim and Final Project Evaluations

Component	Interim evaluations		Final evaluation	Notes
	12 months	18 months		
1				
ted to SMEs	10	40	60	Cumulative
disbursed (\$000s)	\$60	\$300	\$660	Cumulative
operators administering subcomponent	2	2	2	Noncumulative
ted to TSPs (universities, etc.)	2	5	5	Cumulative
disbursed (\$000s)	\$120	\$400	\$400	Cumulative
operators administering subcomponent	1	1	1	Noncumulative
2				
l courses and workshops organized	3	12	20	Cumulative. Principal beneficiary
e training abroad	Regulations	8	8	DTNM
Mexico agreement executed	40%	100%	100%	Idem
y laboratory, functioning	Tender	1	1	Noncumulative
y laboratory, accredited	n/a	n/a	yes	Accreditation by international org
T restructuring plan approved	100%	100%	100%	Before following activity
T implements restructuring	Studies	70%	100%	Implemented with budget and per
g plan. Percentage advance	10%	100%	Implemented	Cumulative
n Fund plan (FONITEC), advance	10%	100%	Implemented	Implemented with venture capital
Follow-up, and evaluation system,	Database/MIS	MIS	MIS	Designed by consulting firm
aters, functioning	1	3	3	Cumulative
d (%)	35%	87%	100%	Cumulative
ution disbursed (%)	22%	85%	100%	Cumulative

PROCUREMENT PLAN

Components/Activities	Financing (US\$ thousand)			Procurement method	Pre- qualification	Date
	IDB	LOCAL	TOTAL			
Steering and Administration						
Individual consultants (coordination)	500	0	500	LCB	NO	I/2001
Consulting firm (interim and final evaluation)	200	0	200	ICB	YES	II/2001
Consulting firm (support for research on innovations)	250	0	250	ICB	YES	I/2001
Equipment and equipment	100	0	100	PC	NO	II/2001
Component 1. Pilot scheme for shared grants and financial outsourcing						
Individual consultants (coordination)	350	0	350	ICB	NO	I/2001
Trainers and NGOs, for MG	200	0	200	LCB	NO	III/2001
Component 2. NIS strengthening						
Individual consultants (4)	82	0	82	LCB	NO	IV/2001
Consulting firm (Marketing plan)	150	0	150	LCB	NO	II/2001
Consultant marketing studies	100	0	100	LCB	NO	VI/2001
Computer equipment (6)	500	0	500	LCB	NO	III/2001
Computer equipment and software (MIS)	140	0	140	PC	NO	II/2001
Trainers (10 ET, 30 months each)	600	0	600	LCB	NO	III/2001

International competitive bidding

Local competitive bidding

Price comparison

II, IV: Quarter

Management information system

PROPOSED RESOLUTION

NICARAGUA. LOAN ____/SF-NI TO THE REPUBLICA DE NICARAGUA
Project to Support Technological Innovation in Nicaragua

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 República de Nicaragua, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Project to Support Technological Innovation in Nicaragua. Such financing will be for the amount of up to US\$6,790,000, or its equivalent in other currencies, except that of Nicaragua, which are part of the resources of the Bank's Fund for Special Operations, and will be subject to the "Financial Terms and Conditions" and the "Special Contractual Conditions" of the Executive Summary of the Loan Proposal.