

SOCIOENVIRONMENTAL AND FORESTRY DEVELOPMENT PROGRAM II (POSAF II)

(NI-0141)

EXECUTIVE SUMMARY

Borrower and guarantor:	Republic of Nicaragua	
Executing agency:	Ministry of the Environment and Natural Resources (MARENA), with the participation of the National Forestry Agency (INAFOR)	
Amount and source:	IDB (FSO):	US\$ 32,700,000
	Parallel financing (NDF):	US\$ 3,000,000
	Local:	<u>US\$ 2,300,000</u>
	Total:	US\$ 38,000,000
Financial terms and conditions:	Amortization period:	40 years
	Grace period:	10 years
	Disbursement period:	5 years
	Interest rate:	1% for the first 10 years and 2% thereafter
	Inspection and supervision:	1%
	Credit fee:	0.5%
Objectives:	<p>The purpose of the program is to improve socioeconomic conditions and living standards of residents of priority Nicaraguan watersheds and lessen the impact of natural disasters in these basins, through the sustainable use and development of renewable natural resources. In so doing, the program will help advance the economy of priority watersheds in the country and make them environmentally sustainable.</p> <p>Specific POSAF II objectives are to: (i) raise the income and living standards of rural producers in the priority watersheds through the sustainable management of renewable natural resources; (ii) lessen the impact of natural disasters in these basins, and (iii) train area residents and help them organize for natural resources management.</p>	
Description:	<p>Component I: Sustainable natural resources management (US\$20.25 million). The <i>farm management subcomponent</i> will help introduce profitable, sustainable production systems on individual farms of approximately 14,150 producers, covering roughly</p>	

310,000 hectares. Support for farm management plans and technical assistance will be provided for every farm for sustainable natural resources management, and new production systems will be set in place on 77,700 hectares, providing material incentives to producers to properly adopt and consolidate the systems. The farms will be situated in selected priority areas in the program's priority subbasins. Some are privately owned operations in protected areas.

The plan is to introduce agroforestry, silvopasture, forest plantation, and woodlot management systems. Producers will draw up an overall plan for their farms with technical advice from an extension agent and with due regard to the respective subbasin's management plans. To entrench the production systems adopted the program will help instill practices involving soil conservation, integrated pest management, living or stone fences, contour plowing, ditching, terracing, pondage and troughs, green manure production and composting, wood-saving stoves, and slope correction.

Each producer will receive material support for one to two years and technical assistance for three years. The technical support will be phased out as a producer becomes familiar with the new practices. One of the criteria for producers to qualify and be chosen for the program will be their firm commitment to participate and furnish the requisite labor. A gender perspective will also be a feature here.

Aims of the *protected areas subcomponent* are the development of co-management plans and their implementation, including investment projects in the protected areas. The *Atlantic Coast pilot projects subcomponent* will fund preinvestment studies and the execution of forestry and agroforestry projects in that region.

Component II: Community works for natural disaster prevention and mitigation (US\$4 million). This component will support local initiatives by municipalities and rural community organizations to cofinance the construction of simple communal works to prevent and mitigate disasters. Works cofinanced by the program must be concordant with the respective subbasin's management plan and must be part of annual municipal-development work plans. The total cost ceiling for a works project will be US\$100,000. Typical works will be retaining walls and gabions, silt traps, riverbank stabilization, gully recovery, slope correction and protection, and protective forest plantations. The program also will pay for participatory activities to produce area hazard maps and disaster early-warning plans.

Component III: Capacity-building and training for natural resources management (US\$3.5 million). The *institutional capacity strengthening subcomponent* includes institutional strengthening of

MARENA and INAFOR and of co-executing agencies and the design and setup of a monitoring system to track the program's progress and impact. The *studies subcomponent* will fund a number of technical studies prioritized by MARENA and INAFOR. The *environmental education subcomponent* will sensitize the general public in the watersheds to specific issues relating to the management of natural resources and protected areas. The *pest and forest fire prevention subcomponent* will finance activities to protect program-area woodlands.

**The Bank's
country and
sector strategy:**

The objectives of the Bank's strategy in Nicaragua are to combat poverty, help achieve sustainable development, and help conserve renewable natural resources. In 1999, in light of the evident need to reduce the region's vulnerability, the Bank adopted a new policy featuring a more integrated, preventive approach to lessening the risk of natural disasters and helping countries to recover from such calamities. POSAF II will help Nicaragua implement its Enhanced Poverty Reduction Strategy in rural areas. The program also is in line with the country's Post-Mitch Reconstruction and Transformation Plan unveiled in Stockholm (paragraphs 1.15 to 1.17).

**Environmental
and social
review:**

For the most part the program's impact on the environment will be beneficial. Any potential adverse impacts would be associated with the civil works construction intended to leave the target areas less vulnerable to natural disasters and the misuse of farm chemicals. To minimize these risks the program would finance the necessary preinvestment studies (including environmental considerations) for municipal works, furnish technical assistance and training on environmental matters, promote sustainable production systems, and teach producers to use farm chemicals correctly. The planned monitoring, follow-up and evaluation activities will check that producers are applying the proposed technologies appropriately and that corrective action is taken promptly when needed (paragraphs 5.3 and 5.4), and that the country's environmental laws and regulations are being adhered to.

Benefits:

The program will yield economic benefits in the form of higher incomes in the long term because the production systems brought in will be more profitable and sustainable and producers will be spending less on agrochemicals. The program's chief environmental benefits will be more sustainable soil and water use, a slowing of the deforestation rate, an increase in soil-protecting plant cover and carbon dioxide capture, and a reduction in water pollution and silting in water bodies. Its social benefits will take the form of enhanced technical and organizational capacity of the target area population and institutions, and less danger of natural disasters.

Risks:

If MARENA and INAFOR do not cooperate sufficiently the project might be implemented more slowly than planned. The institution-strengthening activities and measures planned for the two agencies are designed to counter that risk.

Participating producers could distort the technologies and systems offered to them for efficient natural resources use. To allay that risk, the POSAF I technical assistance model has been improved, so as to make certain that co-executing agencies and beneficiaries will understand and master techniques to put the selected production systems into practice.

Because the POSAF II priority subbasins are prone to natural disasters, the program is advocating watershed management planning as a valuable tool to lessen this risk. The component II mitigation works also will help reduce the risk of natural disasters (paragraphs 5.24 to 5.27).

Special contractual clauses:

Conditions precedent to the first disbursement: The borrower must demonstrate that the following conditions have been fulfilled:

1. The makeup of the POSAF I Program Coordination Unit has been updated and adjusted for the POSAF II activities, on terms agreed upon previously between the executing agency and the Bank (paragraph 3.3).
2. The National Executive Committee has been formed (paragraph 3.4).
3. The MARENA-INAFOR agreement has been signed, on terms agreed on with the Bank (paragraph 3.3).
4. The Operating Regulations have been approved and have entered into force, on terms agreed upon with the Bank (paragraph 3.3).
5. NDF cofinancing for the program has been approved and the respective cofinancing agreement has been signed (paragraph 2.40).

Other special conditions:

1. A midterm review will be conducted 30 months into the program to decide if it requires any adjustments. The final evaluation will be performed at the end of year 5 by reference to indicators agreed on with the Bank (paragraph 3.40).

2. In the course of the program there will be annual operational audits with semiannual reviews, and annual financial audits, in accordance with terms of reference agreed on with the Bank (paragraph 3.41).

Poverty-targeting and social sector classification:

This operation qualifies as a social equity enhancing project as described in the indicative targets for Bank activities contained in the Eighth Replenishment document (AB-1704). It also qualifies as a poverty-targeted investment (PTI) by geographic classification (see paragraphs 1.1, 1.5 and 1.8). The borrower will use the 10% additional financing.

Exceptions to Bank policy:

None.

Procurement:

Contracts for works, goods and associated services, and consulting services for the program will be awarded following the Bank's procurement procedures and policies. International competitive bidding will be required for: (i) works costing US\$1 million equivalent or more and (ii) goods and related services costing US\$250,000 equivalent or more. International calls for proposals must be held for consulting services costing more than US\$200,000 equivalent.

Procurement and contracting for works and goods below the aforelisted thresholds will be governed in principle by Nicaraguan law provided the latter is concordant with Bank policies (paragraphs 3.35 and 3.36).

I. FRAME OF REFERENCE

A. Introduction

- 1.1 With Latin America's highest poverty index and most uneven income distribution, Nicaragua is one of the region's least developed countries. Its human development index of 0.616 places it 121st among 174 nations and lowest among the Central American countries, with US\$410 per capita GDP (World Bank, 1999). Fully 69% of rural households are classed as poor, 29% of them subsisting in extreme poverty, compared to 30% and 8%, respectively, in urban centers (Enhanced Poverty Reduction Strategy, 2000). The rural poverty gap is 28%, nearly triple the urban figure of 10%. The diet of 64% of rural households does not provide the required caloric intake.
- 1.2 Agriculture makes up a huge share of the Nicaraguan economy, accounting for roughly 65% of exports, 45% of jobs and 30% of GDP. As a result of shifting land-use patterns that are replacing forests with extensive ranching and farming and pushing back the agricultural frontier, the country is losing over 100,000 hectares of woodlands every year (FAO, 1990).
- 1.3 The US\$59.7 million that the forestry industry currently contributes to the national economy is only 3% of GDP, but this sector offers enormous potential for Nicaragua's sustainable economic growth, with more than 25,000 square kilometers of forestable land. A few major forestry projects notwithstanding, the country has yet to develop a sizable private forestry industry, mostly because of red tape and controls on commercial operations coupled with a tax and incentives system that leaves forestry at a competitive disadvantage with other agricultural pursuits. Meanwhile, the indiscriminate felling of trees using inappropriate techniques is the chief energy source for Nicaraguan households, 66% of which were using wood cookstoves in 1998.
- 1.4 When Hurricane Mitch battered Nicaragua in October 1998 it left thousands of victims and over US\$1.2 billion in direct economic losses in its wake. The disaster took its heaviest toll in the northern part of the country, leaving painfully evident the environmental and social vulnerability of its watersheds. Since then the country has given greater priority to the question of natural disasters. In March 2000 the National Assembly passed the Natural Disasters Law, creating the National System for Natural Disaster Prevention, Mitigation, and Management. Among the preventive actions called for in the new system are sustainable forestry and agroforestry practices and the construction of channel stabilization structures. The country's pine forests were ravaged last year by a pine weevil infestation. About 10,000 hectares of the affected woodlands lie within the proposed program area.

B. Current conditions in the program area

- 1.5 The rural area encompassed by the program is one of the poorest parts of Nicaragua. The priority targets are areas in which poverty is particularly acute, the levels of environmental damage being so severe as to leave this region particularly vulnerable to natural disasters. Not even larger land-owners in these areas can be considered to be well-off, given the meager economic returns their property yields. An estimated 44% of the program's prospective beneficiaries own less than 7 hectares; 66% have less than 17.5 hectares.
- 1.6 Some factors that helped decide which parts of the country the program should target were the areas in which POSAF I has operated, priority subbasins for the design of POSAF II, and lessons learned from the previous operation. Nicaragua's Forestry Action Plan completed in 1992 specified priority basins for interventions by virtue of their considerable forestry development potential, natural constraints, and existence of heavy population pressures with acute rural poverty problems and rapidly deteriorating renewable natural resources, a result of unsound crop- and stock-farming practices. The nine subbasins thereby identified in the POSAF I operating area take in 22 municipalities in the Northern, Central, and Pacific regions, covering close to 530,000 hectares that are home to a rural population of about 350,000 (58,000 households).
- 1.7 The program's area of influence overlaps considerably with the region devastated by Hurricane Mitch in 1998. In a watershed prioritization study done to help design POSAF II, the POSAF I subbasins were classified as follows: top priority—Southern Managua Basin, Jiguina River, Estelí River; high priority—Coco River; medium priority—Jícaro River. The main criteria for the ranking were value/importance, risks/vulnerability, and response capacity/timeliness.
- 1.8 The subbasins that POSAF II will target offer mainly forestry and agroforestry potential. They are home to seven mid-sized cities—Ocotal, Somoto, Estelí, Matagalpa, Jinotega, Diriamba and Jinotepe—and the country's capital, Managua. Their population (urban and rural) is 1.5 million, about 30% of the country's total. The extreme poverty rate ranges from 64% to 92% except in Managua, where it is around 16%. Land in the priority subbasins is currently forested, covered with scattered brush or secondary forest or vegetation, or is being used to grow crops or graze livestock. Erosion ranges from heavy to severe in half the subbasins, affecting over 25% of their surface area; the other half are experiencing 10% to 25% erosion. The area is extremely vulnerable to landslides and flooding during hurricanes and torrential rains.
- 1.9 Seven protected areas covering 75,068 hectares lie within the program zone. All have been established by decree, mostly by virtue of their landscape value and biodiversity. There have not been enough public funds to promote or develop them. Since the land is privately owned, each area has to be managed under a

co-management plan worked out by MARENA with local residents, frequently with project or NGO support.

- 1.10 The most serious environmental problems in these protected areas have to do with a shift in land-use patterns that is rapidly destroying forests. Underpinning the process is a complex mix of factors: an undervaluation of natural resources, a dearth of financing facilities or incentives for sustainable natural resources management, few producers applying appropriate management technologies, and weak institutions. Deforestation, in turn, triggers soil erosion, the silting-up of surface water sources, and irregular streamflow regimes in watersheds. Farming operations are the leading source of pollution in all these subbasins except the Southern Managua watershed that is being contaminated by industrial wastes and household sewage.
- 1.11 Along the Atlantic coast, most productive forests are in the hands of the Miskita and Mayagna indigenous communities and Afro-Caribbean communities. There are problems concerning the legal tenure of this land and property boundaries. Since there is not much of an institutional presence in these areas and local communities do not have the organizational capacity for natural resources development or management, particularly for forest resources, wood is being illegally harvested, jeopardizing the sustainability of this resource and yielding no financial return for community members.

C. The government's strategy

- 1.12 The Nicaraguan State understands the relationship in today's global economy between competitiveness, sustainable development, and integration. Environmental protection now is viewed as a source of competitive advantages if a country has a strategy in place to build a production apparatus around natural resources and markets for environmental goods and services. In 1994 the government launched the Modernization of the State Program to scale back the public sector, privatize State-owned enterprises, and build local capacity. More recently, the country's Enhanced Poverty Reduction Strategy is calling for a sustainable national development strategy to be implemented by 2005 and its 2000-2005 Environmental Action Plan maps out a comprehensive strategy to protect the country's ecology.
- 1.13 The nation's new forestry development policy adopted in 2001 sees the forestry industry as a viable alternative to raise the standard of living of Nicaraguans who rely on that resource and as a national economic development focus. The Environment and Natural Resources Act (Law 217) provides legal underpinnings for protected-area management.
- 1.14 POSAF II is consonant with the above-mentioned government policies and strategies for environmental protection and sustainable natural resources management.

D. The Bank's strategy

- 1.15 Sustained growth with equity is the overarching objective of the development strategy put forward by the Bank in the country paper. Two of the four main avenues specified to that end are to: (i) make optimum use of natural resources and conserve them and (ii) foster private enterprise, particularly in the agricultural sector that drives the Nicaraguan economy. The object of the strategy is to revitalize this sector and thereby help the economy back onto a strong growth path. A preeminent consideration is the need to reduce widespread poverty, which is concentrated in rural parts of the country.
- 1.16 In keeping with the principles underlying the above-mentioned strategy and drawing on the experience the Bank has gained in similar operations, POSAF II would foster and support initiatives to make sustainable use of natural resources, especially forests, soil, and water, to break the vicious cycle of rural poverty and despoilment of natural resources that is exacerbated by the association between that process and an area's vulnerability to natural disasters.
- 1.17 Since 1999, in light of the magnitude of the Hurricane Mitch disaster, the Bank has ascribed high priority to an integrated approach to natural disaster prevention and mitigation in countries in the region, and to helping the country implement its Enhanced Poverty Reduction Strategy in rural areas. These new Bank strategy priorities have been taken into account in POSAF II, which also is in line with the country's Post-Mitch Reconstruction and Transformation Plan unveiled in Stockholm.

E. The Bank's experience and actions of other donors

- 1.18 The Bank has a wealth of experience in watershed management and sustainable renewable natural-resources development projects and operations to prevent natural disasters in Central America. Among these are the El Salvador Environmental Program (886/OC-ES), the El Cajón Watershed Management Project in Honduras (718/OC-HO and 918/SF-HO), the Chixoy Basin Management and Soil Conservation Project in Guatemala (871/SF-GU), and the Socioenvironmental and Forestry Development Program (POSAF I) in Nicaragua (970/SF-NI).
- 1.19 One lesson learned from those earlier operations is the importance of introducing soil and water conservation practices in watersheds and of fostering improved, sustainable farming and forestry practices to raise area residents' incomes. Keys to these projects' success were the institutional apparatus, community involvement, environmental education, and incentives systems.
- 1.20 Another Bank-funded project now under way in Nicaragua is the Food and Agricultural Production Revitalization Program (1001/SF-NI) which is fostering rural development. It will complement the POSAF II activities, notably by promoting productive infrastructure works in over 70% of the area that POSAF II will address.

- 1.21 On the technical cooperation side the Bank recently funded a study (ATN/NC-6559-NI) to assess the area's vulnerability. The area examined therein overlaps greatly with the POSAF II zone and will provide a frame of reference for component II activities in this new POSAF operation. Another technical-cooperation project slated to begin in 2001 is the National Land-Use Planning Program—PRONOT (ATN/JF-7372-NI). In addition to pursuing its own aims that operation will serve as a direct resource for preparation of land-use plans that POSAF II will be promoting.
- 1.22 The National Forestry Agency (INAFOR) is currently executing the World Bank-funded Forestry Development Program (PROFOR) which complements POSAF activities (for instance in moves to strengthen the forestry sector's legal and institutional frameworks and in market surveys), coordination arrangements having been devised for the purpose. The World Bank also recently approved a multiphase loan for the Rural Technology and Training Program to be executed by the National Agricultural Technology Agency (INTA) at an estimated cost of US\$150 million over 15 years. Work for POSAF II needs to be coordinated with INTA since the sustainable practices underpinning the various POSAF-advocated production systems should transcend the program's geographic boundaries and could be widely disseminated by INTA.
- 1.23 The World Bank also is developing a program to support rural municipalities (PROTIERRA II) that has elements in common with some of the proposed POSAF II investments. Coordination arrangements have been worked out to avoid duplication on the programming side in these operations. The municipalities slated for POSAF II support are different from the ones that PROTIERRA II will target.

F. Institutional framework for the program

- 1.24 Comprising the institutional apparatus for the proposed program are the Ministry of the Environment and Natural Resources (MARENA) as policy-maker and regulator of environmental affairs and watershed-based natural resources management; the Ministry of Agriculture and Forestry (MAG/FOR) which formulates agricultural policies and strategies working through several institutions: for research and new technologies, the Nicaraguan Agricultural Technology Agency (INTA); for forestry research and management matters, the National Forestry Agency (INAFOR); for area studies and cadastre matters, the Nicaraguan Institute for Regional Studies (INETER), and for execution of rural development investments, the Rural Development Agency (IDR).
- 1.25 A number of commissions also are part of the institutional framework: (i) the National Forestry Commission that puts forward policy proposals and fosters forestry development; (ii) the National Environment Commission created in 1996 as a forum for environmental policy discussion with private-sector participation; (iii) the National Agricultural Commission set up in 1994 with an interagency policy coordination mandate; (iv) the National Commission on Environmental

Education that began operating in 1994, and (v) the Water Resources Commission, reorganized in 1993.

- 1.26 One important move by the government was the 1994 launch of the Modernization of the State Program. This initiative operated out of the Office of the Vice President, through the Coordinating Unit for the Public Sector Reform and Modernization Program that was designed to modernize the State apparatus and privatize government-owned enterprises. One of its highlights was the passage of Law 290 in 1998 which moved the forestry area out of MARENA and created the National Forestry Agency (INAFOR) under MAG/FOR.
- 1.27 Two operational pieces of this institutional apparatus that will be key to the workings of the program described here are the country's Environmental Action Plan updated in 2000 and the Forestry Action Plan. POSAF II was conceived by reference to these policy tools and will complement government actions under the two plans.

G. POSAF I: Outcomes and lessons learned

- 1.28 *The POSAF I strategy:* Since 1996 the Nicaraguan government has been implementing the Socioenvironmental and Forestry Development Program (POSAF I) to foster sustainable natural resources development in watersheds that were identified as priorities in the 1992 Forestry Action Plan and, in the process, to reduce high rural poverty levels.
- 1.29 *Physical outcomes:* The actual area of POSAF I operations has come very close (92%) to the original estimate, totaling 81,191 hectares, but the 11,384 producers it has assisted are 2.4 times the initial beneficiary estimate. This is because the program concentrated on small producers who were mainly interested in more intensive production systems for their small individual holdings. The program covers 15% of the total acreage of the targeted watersheds and 20% of producers living there. Community works costing US\$590,000 for natural disaster prevention and mitigation were built in 12 municipalities, the demand for such structures having far exceeded expectations.
- 1.30 *Economic returns:* By the third year of their involvement in POSAF I, producers' annual per-hectare farm income had risen on average by US\$76 (129%) for agroforestry systems and US\$28 (78%) for silvopasture systems. This income increase is sustainable because it originates in higher output of some annual crops and fuelwood harvesting. Given the average acreage of the parcels receiving support, annual household farm income rose US\$175 for agroforestry systems and US\$255 for silvopastoral systems.
- 1.31 These figures understate the medium- and long-range benefits that come into play when fruit, coffee, and wood are harvested. According to estimates from a random sample of 95 observations, the average unit price of land that was improved using POSAF I-promoted systems all but doubled, from US\$1,027/hectare to

US\$2,024/hectare. This increase is several times what it cost to improve the parcels. Producer satisfaction levels are very high, many producers having been able to work full-time on their farm and earn more than their off-farm labor had previously brought in. The practices fostered by POSAF I continue to be financially attractive to producers even after they cease to be eligible for the incentives available to program participants during the introduction period.

- 1.32 *POSAF I impacts:* According to the POSAF I impact assessment (the starting point for the POSAF II feasibility study) the program successfully introduced production systems that make for better natural resources conservation and management. These systems are yielding higher incomes for producers and their families and are instilling a greater appreciation of the value of natural resources. However, the POSAF I activities were scattered and did not focus on the most critical areas where they would likely have achieved a stronger environmental impact. The chief constraint was not having developed management plans for the selected subbasins, which would have made it possible to prioritize critical zones for management within each subbasin and thereby concentrate activities where they would have the heaviest impact. Since the program focused on small producers who were interested mainly in more intensive production systems, there was heavier demand for agroforestry systems than for silvopasture and forestry options.
- 1.33 *Success factors for individual farms:* Factors that made the program a success for participants were: (i) campaigns to promote the program and motivate producers; (ii) comprehensive planning of the farm as an economic unit; (iii) producers' willingness to contribute family or hired labor, and (iv) the caliber of technical assistance received.
- 1.34 *The implementation model:* One key to the program's success is its organizational approach that delegates implementation responsibility by way of contracts with specialized co-executing agencies (CEAs). It has been decided to continue with that model but strengthen its regulations, communication avenues, monitoring systems, training for CEAs, and remuneration, to enhance the quality of technical assistance and prevent irregularities. There will be new selection procedures with a more competitive focus. The nature of the program's relationship with municipalities will change to more of a partnership to cofinance the construction of disaster prevention and mitigation works.
- 1.35 *Program monitoring:* The POSAF I monitoring, follow-up and evaluation system (SIMOSE) has proved to be one of the program's weakest points. Though the Program Coordination Unit has abundant information on resource allocation and tracking and on the achievement of physical and financial targets and their evaluation, this has not been a systematic aid to management decision-making. The SIMOSE thus will be redesigned, factoring in the findings of a baseline study, to decide on impact indicators to be measured in the course of POSAF II.
- 1.36 *Sustainability of investments:* Two years of POSAF support to each farm clearly has been insufficient to make for lasting improvements under the program, so the

plan is to continue to furnish technical assistance after the technology-change incentive period ends. To fill another evident need, POSAF II will specify more precisely the kind of support the program will offer, both for technical assistance and for material aid, based on individual producers' characteristics and their willingness to adopt new production patterns, to make their operations more sustainable and wean themselves from the program to become fully self-reliant. In POSAF I, total transfers to producers in the form of two years of technical assistance for each and payment of materials came to US\$927 per producer, for an average of US\$137 per hectare. The plan in POSAF II is to raise the incentive ceiling to US\$1,300 per farm, which will make for better-quality technical assistance and extend its duration to three years for each producer.

- 1.37 *Cofinancing with the Nordic Development Fund (NDF)*: Owing to procedural difficulties and delays in expending the NDF's loan proceeds in POSAF I its conditions had to be rethought before recommending that it cofinance POSAF II as well. It has been agreed that NDF funding will focus on technical assistance, avoiding delays by having the Bank take full responsibility for technical monitoring of NDF-funded items.
- 1.38 *The institutional apparatus*: INAFOR's institutional shortcomings and the fact that it was not an integral part of POSAF I operations held back the program's forestry development side. The plan to integrate INAFOR at every level of POSAF II will mean stronger technical input on forestry matters and more expeditious approval of forest management and development plans in the program area.
- 1.39 The POSAF I financial statements were prepared in accordance with Bank requirements, audited by an independent audit firm and submitted on time, except for the 1999 statements which were received slightly after the deadline because of delays in the Comptroller General's Office. The audited 2000 statements, accompanied by an unqualified audit opinion, were presented on schedule.

II. THE PROGRAM

A. Conceptual overview

- 2.1 Rural poverty, the steady deterioration of renewable natural resources, and the rural poor's vulnerability to natural disasters are the variables creating a vicious circle of impoverishment exacerbated by low education levels, strong population growth, and the overtapping of natural resources. The Socioenvironmental and Forestry Development Program (POSAF) is designed to break this circle by disseminating new sustainable production practices that will conserve the production base and assure producers of higher incomes and long-range returns. Intensive technical assistance and the promotion of appropriate technologies, environmental education to teach the target population about watershed management, and incentives for producers until their operations yield economic returns have proved to be effective instruments to achieve those goals.
- 2.2 Another essential facet in parallel with the above-mentioned activities, to benefit the collective, is support for municipalities and communities to lessen their vulnerability to natural disasters. Without efforts on that front, on-farm investments could be for naught. The plan is to bolster all of the individual and collective activities by developing technical capacity and focusing the program's investments on subbasins and zones in which it is likely to have the strongest environmental, social, and economic impact.
- 2.3 POSAF II therefore is conceived as a program for sustainable natural resources development in priority watersheds to demonstrate that, in practice, sustainable economic development and natural resources conservation are not mutually exclusive pursuits. Indeed, the two elements complement one another, and neither is viable without the other. There is a pressing need to step up efforts begun in POSAF I in order to heighten the program's impact, achieve better results in natural disaster mitigation and entrench the cultural change that will see this approach adopted as the predominant model for natural resources management in priority Nicaraguan watersheds.

B. Objectives

- 2.4 The purpose of the program is to improve socioeconomic conditions and raise living standards of residents of the priority watersheds and lessen the impact of natural disasters on this population, through the sustainable use and development of renewable natural resources. In so doing the program will help develop the economy of these priority watersheds and make them more environmentally sustainable.
- 2.5 Specific objectives of the program are to: (i) raise incomes and living standards of rural producers in the priority watersheds through sustainable management of renewable natural resources; (ii) lessen the impact of natural disasters on those

watersheds; and (iii) train program area residents and help them organize for natural resources management.

C. Scale of the program

- 2.6 POSAF II will operate in the same geographic area as POSAF I but will focus on the prioritized zones of the subbasins, in accordance with their respective management plans, so that the program activities will have a greater impact. The main selection criteria adopted can be grouped into elements of vulnerability, environmental hazards, poverty, and development potential. POSAF II will reach more producers living in priority zones in the subbasins who have yet to benefit from the program. Another determinant of the program's scale was the installed institutional implementing capacity in 22 target municipalities and the areas and producers not yet addressed by the program. As a result, POSAF II is expected to take in more than 14,000 new producers, boosting the percentage of farms covered by the program to 45% of all rural households in the subbasins. The program would cover 310,000 hectares of private farms (management activities) and 75,000 hectares of protected areas (for support by way of co-management plans). A further feature of the program will be pilot investments in the Atlantic Region, to set the stage for future initiatives similar to those planned for POSAF II.
- 2.7 **Beneficiary profile.** The program's target population will be: (i) poor small-scale rural producers who are earning barely enough to pay for food and a few basic services; (ii) mid-sized producers who are able to generate some surpluses but have difficulty accessing services, notably technology; (iii) women producers who will take part in program-sponsored activities and also will benefit when more fuel-efficient wood-fired cookstoves are introduced; (iv) indigenous and Afro-Caribbean communities living in the Atlantic Coast region who are lacking some basic necessities (adequate food and essential services) and have access to land with communally owned natural resources; and (v) municipalities and residents of the program's target areas who stand to gain from the natural disaster prevention and mitigation activities. All of these beneficiaries except the Atlantic Coast indigenous and Afro-Caribbean communities were targeted by POSAF I. POSAF II also will provide improved services to women producers and participating municipalities.
- 2.8 **Beneficiary selection criteria:** The criteria used to select beneficiaries and decide on the target rural population are as follows: (i) producers, communities, and municipalities must be located in one of the program's priority areas; (ii) individual beneficiaries must own their farms; (iii) they must be prepared to make the counterpart contribution prescribed in the Operating Regulations, and (iv) they must be willing to receive technical assistance and training.

D. Program description

1. Administration and supervision (US\$5.5 million)

- 2.9 This item consists of about US\$4.1 million in Program Coordination Unit (PCU) operating costs, broken down as follows: US\$137,000 for vehicles and US\$663,000 for operating expenses; US\$223,000 for promotional expenses; US\$1.17 million for consulting services, and US\$3.3 million for PCU salaries (US\$150,000 from INAFOR). The salaries and operating expenses budgeted will pay for activities of the five area offices, which were strengthened as recommended in the POSAF I midterm review and confirmed in the POSAF II feasibility study. The main consulting tasks will be a feasibility study for a possible POSAF III and a final evaluation study, at a cost of US\$600,000.

2. Component I: Sustainable natural resources management (US\$20.2 million)

- 2.10 This component will introduce more sustainable production systems with higher earnings prospects for individual farms of about 14,150 families. It will fund investments on approximately 77,700 hectares and, on a further 232,300 hectares, will provide indirect support through farm management plans and technical assistance only, along with collective actions for the management of 75,000 hectares of protected areas. Some farms in the priority subbasins are situated within the protected areas, whose management classification permits the use of these production systems.

a. Farm management subcomponent (US\$16.5 million)

- 2.11 POSAF II will introduce agroforestry and silvopasture (forest/grazing) systems, forest plantations, and woodlot management, all of which have been shown to be technically and economically sustainable. The emphasis will be on comprehensive planning of a farming operation taking a holistic, sustainable approach, the technical agent's function being to help producers make decisions with due regard to the management plan of the subbasin in which they are located. One facet of POSAF II that differs from the previous program is that the "technology packages" that for POSAF I were incentives as separate systems can now be combined, with the whole being planned by reference to the natural resources and socioeconomic circumstances of the individual farm.
- 2.12 The specific material supports associated with the various production systems (trees and plant material, posts, fences, etc.) give producers an incentive to execute on-farm works and investments they had not previously tackled because they entailed new technology or the producers considered it too risky to switch to a new production system. Depending on the kind of systems to be introduced, material support will be provided for one or two years but technical assistance will continue through to the end of the third year, diminishing as the producer becomes familiar with the new practices. There will be limits on the acreage eligible for activities

involving these material incentives, depending on the production system, but the technical assistance will cover the entire farm, taking a comprehensive approach to the production system and giving producers the possibility of executing, out of their own pocket, the same activities on larger expanses of land.

- 2.13 The Operating Regulations specify the criteria for producer eligibility and selection, to make sure prospective beneficiaries are truly committed to the program and are prepared to take part in it and contribute labor. One of the criteria adopted is a gender perspective, to make certain that the program conditions take due account of the specific needs of women, particularly female heads of household. New selection criteria also have been devised for co-executing agencies (CEAs), to choose organizations that will deliver high-caliber technical assistance and heightening competition among these agencies on the basis of technical proposals, staff availability, and track record in previous projects.
- 2.14 The production practices that POSAF II will be fostering are for agroforestry and silvopasture systems, establishing forest plantations, and woodlot management, in combination with soil conservation practices. The specific objectives of these practices are to: (i) raise the income of producer households; (ii) expand the forest cover in order to conserve soil and water; (iii) reduce the deforestation being caused by wood consumption; (iv) slow erosion and ease the risk of drought, and (v) reduce environmental pollution.
- 2.15 The acreage and number of farms in which the different production systems might be introduced (Table II-1) was calculated, looking at land-use capability and estimating producers' interest in the various approaches. Woodlot management, natural regeneration and plantation establishment are the production systems likely to take in the largest acreage (24% in all).

Table II-1		
Number of farms and acreage by system (estimate)		
Systems	Farms	Total Acreage (Ha)
Agroforestry	8,000	21,000
Silvopasture	2,000	14,400
Woodlot management	4,150	42,300
Total	14,150	77,700

- 2.16 With assistance from an extension agent, each producer will design a farm plan that can boost earnings and improve natural resources management once the producer is using the new techniques for which incentives have been offered. The decision on which production systems to promote most heavily in each priority zone will be made by reference to area management plans and the findings of a baseline study to

be completed before the program begins. This study will provide details of current practices, economic returns and environmental impacts in each area. The production-systems menu will be flexibly applied to take conditions in each priority microbasin into account.

- 2.17 **Extension methodology.** The planned extension service will promote production systems on the POSAF II menu and help producers plan for and adopt a new system. Extension agents will explain the practices associated with the systems and advise producers on implementing those that are best suited to the systems they have selected. The cap on incentives to any one producer is US\$1,300. Investments will begin on individual farms during years 1, 2 or 3 of the program so that every participating producer can receive two years of material incentives and an additional year of technical assistance.
- 2.18 The extension agents' mission is to help producers learn to identify, analyze and rank problems, come up with solutions, evaluate and choose among options, learn by doing, and assess the outcomes of the options selected. The participatory evaluation methodology will consist of comparing areas in which the new practices have been instilled with those being traditionally managed, so producers can examine with-project and without-project outcomes. The evaluation also will look at such indicators as changes in income, adoption of the new practices in other parts of the farm, and their adoption by producers who did not receive incentives.
- 2.19 Other services to be provided by the extension agents will deal with integrated farm management practices such as alternatives to burning and stubble destruction, crop rotation, contour farming, and integrated pest management. The planned modes of technical-assistance delivery are concordant with the POSAF I Technical Assistance Model (MATEC). There will be group discussions, field days, producer exchanges, support visits to farms and field trials. Printed and audiovisual instructional aids will be used. Interested producers who are not receiving material incentives will be invited to take part in activities such as field days and producer exchanges.

b. Protected areas subcomponent (US\$2.2 million)

- 2.20 A feasibility study was done during POSAF I on co-management models for protected areas, and two management plans were designed in participatory exercises. A further four plans would be produced in the course of POSAF II and support would be provided for implementation of all six plans. However, the program is not intended to fund the full content of the plans: POSAF II will facilitate and cofinance selected investments so the co-management arrangement can work independently of the program and become sustainable by the time the operation ends.
- 2.21 The foregoing provisions are built into the program's Operating Regulations so the Protected Areas Directorate (DGAP) can ensure that every one of the program activities in protected areas conforms to the respective management plan. Another

condition in the Operating Regulations is that the DGAP must previously clear disbursements of program funds for farms situated in a protected area.

- 2.22 The program will help fund investments needed to create basic conditions for the operation of protected areas, which also will become resource centers for area residents. A prerequisite for such support will be the development and approval of the respective management plan. Apart from operations centers the program will fund investments in protected area management activities such as the construction of paths and tracks, lookouts, landmarking, etc. Since land in these areas is privately owned, the program would also fund community investments to improve residents' quality of life (access roads, channeling, bridges, etc.).

c. Atlantic Region pilot projects subcomponent (US\$1.5 million)

- 2.23 To launch POSAF II in the autonomous Atlantic regions that, despite their rich forest endowment, are home to most of Nicaragua's poor, the program will finance pilot projects in the two Atlantic macroregions. Though the projects will pursue the program's general objectives, focusing on forestry, silvopasture and agroforestry development, more flexibility will be needed because of this region's unique features (ecology, ethnic makeup, culture) and because these are pilot ventures. Activities that are not part of the program elsewhere in its target area will be permitted in these regions provided they address themselves to the program's overall objective.

3. Component II: Community works for natural disaster prevention and mitigation (US\$4 million)

- 2.24 This component will support municipalities' local initiatives to cofinance the construction of small-scale communal disaster prevention and mitigation works and related activities. The idea is to expand the POSAF I effort so as to leave residents of the priority subbasins less vulnerable to natural disasters by building structures of this kind, for which there is an unmet demand. The works that POSAF II will be cofinancing will be part of municipal annual work plans. The cost ceiling will be US\$100,000 per works project except in the Lake Managua southern watershed where the cap will be US\$200,000. One objective of the prefeasibility studies will be to look for incremental improvements by strengthening or maintaining existing infrastructure.
- 2.25 As a prelude to the decision on which works will be funded there will be a participatory process in 22 municipalities in the priority subbasins, consisting of: (i) an inventory and analysis of maps and other information on hazards and vulnerability; (ii) commissioning and execution of studies to produce missing hazard maps, focusing on areas that are prone to landslides and flooding; (iii) participatory workshops in each municipality to reach a consensus on areas identified within each risk category, mitigation areas, and prospective measures; (iv) pre-identification of structures required to reduce risks in the program area; and (v) commissioning and execution of feasibility studies for the pre-identified

structures, prioritized by the Program Coordination Unit (PCU) from among the municipalities' applications (see Operating Regulations).

- 2.26 Municipalities will decide on priorities locally and arrange financing for the works as of year 1 of POSAF II. These will be structures needed at critical sites, built through cofinancing arrangements. Most of the structures will be started as of year 2 to allow time for design studies for each. The exception is the Lake Managua southern basin for which specifications have already been drawn up in accordance with the feasibility study for the Lake Managua Basin Management Program; in this case, work can begin in year 1.
- 2.27 The program's Operating Regulations outline eligibility criteria as to projects, amounts, acreage, local contribution requirements, and rules and procedures for selection, contracting, execution, supervision and maintenance. Communities will be encouraged to take active part in planning, implementing, and maintaining the works.¹

4. Component III: Capacity-building and training for natural resources management (US\$3.5 million)

- 2.28 The aim of this component is to help build institutional capacity locally, in civil society and in government agencies so they can become partners in sustainable natural resources management with a watershed planning and management focus. Some benefits of this effort will be closer interface with the other components and better prospects for optimizing investments in natural resources use and management (component I) and a lessening of the target areas' vulnerability to natural disasters (component II). In sum: this component will help harmonize the program's economic, social, environmental, and institutional dimensions to make its actions sustainable. It involves not just traditional institution-strengthening but also an interagency coordination and interface effort to make sure the numerous specific watershed management initiatives complement one another and to tap synergies.

a. Institutional capacity-building subcomponent (US\$2.5 million)

- 2.29 **Institutional strengthening of MARENA (US\$410,000)/INAFOR (US\$405,000).** The program will support MARENA and INAFOR by enhancing their managerial and operational capacity, particularly in the regions, through training and studies to come up with solutions to watershed problems. The objectives of the new strategy are deconcentration and better regional distribution of these agencies' operations, seeking efficiency and quality gains to make the institutions more responsive. The investments will finance training courses and workshops, courses on woodlot management, office equipment and vehicles for field inspections, and equipment for MARENA's Environmental Education

¹ Support from the World Food Programme, through its food-for-work program that was used successfully during POSAF I, will continue to be available for execution of these works.

Division. Specifically, the program will: (i) help operationalize MARENA's Strategy for Decentralization of the National Protected Areas System (SINAP); (ii) equip MARENA to comply with the Natural Disaster Prevention and Mitigation Act and help make sure it is duly implemented at the local level; and (iii) strengthen INAFOR to efficiently secure approval of forest management plans and forest management and logging permits.

- 2.30 **Institution-strengthening for co-executing agencies and municipalities (US\$939,000).** An inventory will be done of existing training materials (MARENA, INAFOR, Sustainable Hillside Farming Program, Nicaraguan Agricultural Technology Agency, etc.) to see if they are suitable and useful for co-executing agencies (CEAs) on topics relevant to POSAF. New materials will be produced where required. To convey the program's messages to producers and the general public, these materials will deal with environmental education issues. Existing land-use planning maps also will be made available. Program-funded courses and workshops will address such topics as: (i) POSAF objectives and strategies and the CEAs' role; (ii) basic concepts of watershed planning; (iii) environmental and natural resources legislation; (iv) administration and financial management of the program; (v) opportunities for CEAs to share their experiences; and (vi) compilation and maintenance of data for an evaluation of the program's outcomes and impact.
- 2.31 To create synergy in watershed planning and management work at the municipal level, POSAF II will pursue more effective interagency coordination at the central level, among various agencies and pertinent projects, particularly with the Nicaraguan Municipal Development Agency, the Association of Nicaraguan Municipalities, the Municipal Development Project (PRODEMU), the Program of Support for the Environmental Sector in Nicaragua (PASMA) and the Nicaragua-Finland Environmental Programme (PANIF). The program will strengthen the interagency coordination arrangements that are already in place between INAFOR and MARENA area offices under the terms of each department's current agreements.
- 2.32 To encourage coordinated, economically viable planning at the watershed level and realistic, technically viable management activities headed by municipal governments, the program will support and foster: (i) the creation of Municipal Watershed Management Associations and institution-strengthening for existing associations in Estelí and Matagalpa; (ii) creation and strengthening of Municipal Environmental Commissions in the 22 municipalities targeted by the program, and (iii) strengthening of city hall bureaus to give them better tools and expertise to deal with environmental issues. Training will be one form of support, covering topics such as: (i) land-use planning, in coordination with the National Land-Use Planning Program (PRONOT); (ii) interpreting legislation; (iii) writing municipal environmental ordinances; (iv) a gender perspective in planning; (v) planning, administration, execution, and supervision of community works; and (vi) special

support for municipalities that have protected areas within their boundaries,² including legislation, regulations, and SINAP standards; co-management plan contents; negotiation and dispute settlement approaches, and management issues. Support for municipal capacity-building and intermunicipal coordination will be provided in consultation with the MARENA and INAFOR representatives.

- 2.33 **Design and setup of a monitoring system to track the program's progress and impact (US\$712,000).** At the start of POSAF II a contract will be tendered for detailed design, testing, and commissioning of a thoroughly revamped version of the Monitoring, Follow-up and Evaluation System (SIMOSE) that was installed during POSAF I. This will include both administrative functions and monitoring and evaluation of program activities and of their outcomes and impacts. The baseline study will provide valuable input for the system design, particularly for decisions on indicators.

b. Studies subcomponent (US\$250,000)

- 2.34 **Technical studies.** The program will fund a number of management and evaluation studies, including specific studies on natural resources in watersheds (and completion of studies on the management of priority subbasins begun under POSAF I), studies on procedures and rules pertaining to forest rights, an evaluation of the Forestry Action Plan at the ten-year mark and arrangements for a second phase with priority-setting, and other studies that are MARENA or INAFOR priorities. Most of the studies would be produced during years 1 and 2 of POSAF II so their findings can be put to good use during the program's implementation.

c. Environmental education subcomponent (US\$550,000)

- 2.35 The purpose of this subcomponent is to make the general public aware of conditions in the program's priority subbasins, including protected areas, and of natural disaster prevention and mitigation issues. Co-executing agency activities will include environmental education projects on integrated watershed management planning topics. The projects will have to adhere to the POSAF II Operating Regulations and employ methods tailored to the target groups and type of event (seminars, publicity and awareness-raising campaigns, specialized short courses and workshops).
- 2.36 The environmental education projects, which will tie in directly to the other program components, will take place in communities located in the priority zones of the watersheds. The main focuses will be investments in private farms (including those situated in protected areas) and natural disaster prevention and mitigation. The formal education projects are designed to be appealing and focus on sustainability. With their capacity enhanced, instructors can teach children and young people about environmental protection and have a replicative effect.

² There is a separate budget line under component I, subcomponent 2, for expenditures in protected areas. The component III budget includes only municipal institution-strengthening activities in this regard.

- 2.37 The number and kind of events organized under this subcomponent will depend on the demand, which in large measure will have to be induced by POSAF among the targeted groups. However, a number of needs were identified in the feasibility study, considering the strengths and weaknesses of the public and private agencies that will participate in the program.

d. Pest and forest fire prevention subcomponent (US\$200,000)

- 2.38 This subcomponent will fund prevention activities in the program zones and forest plantations, firebreaks, brigade firefighting gear, studies on specific insect pests, preventive felling of infested trees, etc. INAFOR will execute these investments following procedures and criteria in the program's Operating Regulations.

E. Program cost and cofinancing

- 2.39 The total estimated cost of the program, including financial charges and the "Unallocated" line item, is US\$38 million. The breakdown by item of expenditure is shown in Table II-2.

Table II-2. Program cost and cofinancing (US\$000)					
Expenditure item	FSO	NDF	Local	Total	%
1. Administration and supervision	4,550	650	300	5,500	14%
2. Natural resources	17,770	1,080	1,400	20,250	54%
3. Mitigation structures	4,000	-	-	4,000	11%
4. Capacity-building for resources mgt.	2,530	970	-	3,500	9%
Subtotal	28,850	2,700	1,700	33,250	88%
Unallocated	2,700	300	200	3,200	8%
<i>Contingencies</i>	<i>1,400</i>	<i>150</i>	<i>100</i>	<i>1,650</i>	<i>4%</i>
<i>Escalation</i>	<i>1,300</i>	<i>150</i>	<i>100</i>	<i>1,550</i>	<i>4%</i>
Financial charges	1,150	-	400	1,550	4%
<i>Interest</i>	<i>820</i>	-	-	<i>820</i>	<i>2%</i>
<i>Credit fee</i>	-	-	400	400	1%
<i>Inspection and supervision (1%)</i>	<i>330</i>	-	-	<i>330</i>	<i>1%</i>
TOTAL	32,700	3,000	2,300	38,000	100%
Percentage	86%	8%	6%	100%	

- 2.40 In addition to the FSO funding the program would receive US\$3 million in financing from the Nordic Development Fund, US\$1.5 million of it in tied funds to pay for a study on the Monitoring and Evaluation System (SIMOSE), further watershed management studies, a feasibility study of a possible POSAF III, and other research exchange studies. The untied portion will defray operating costs of parks located in the protected areas, studies, training, and technical assistance. **Presentation of the signed Government of Nicaragua/NDF cofinancing agreement will be a condition precedent to the first disbursement.**

F. Local counterpart

- 2.41 The local counterpart contribution will be US\$3.8 million. The Bank will recognize as local counterpart funds up to the equivalent of US\$1.5 million from the NDF, the US\$2.3 million balance to be supplied as local counterpart funding, entailing an annual allocation of US\$460,000. That will cover US\$300,000 in PCU operating costs and US\$2 million in component I investments. In order to ease the burden on the government budget it is recommended that the municipalities' contribution of about US\$600,000 and an equal amount from the beneficiaries be recognized toward the local counterpart. These requirements are set out in the Operating Regulations and in the respective agreements to be signed. The aforementioned contributions can be accounted for and checked by reference to construction contracts (for municipal works) and briefs for the projects presented and accounted for by CEAs. That contribution will be recognized in equal annual portions.

III. PROGRAM IMPLEMENTATION

A. General implementation arrangements

- 3.1 Since the conceptual, methodological, and structural elements of the POSAF I coordination and execution arrangement worked well they also will be used in POSAF II. However, some adjustments will be made in light of the experience gained in the previous program and to incorporate recommendations that came out of the evaluations and involve the forestry authority INAFOR, in conformity with the new Law 290.
- 3.2 Among the planned adjustments for POSAF II are changes in the makeup of the various committees, improved procedures, more local participation, more complete, albeit flexible, regulations, and closer monitoring to assess the program's achievements and impact.
- 3.3 The executing agency will be the Ministry of the Environment and Natural Resources (MARENA) with the participation of the National Forestry Agency (INAFOR) for forestry-related elements. INAFOR's involvement will be formalized in a framework agreement signed by the two agencies. Their respective activities and responsibilities will be specified in the program's Operating Regulations. The program will be implemented through a **Program Coordination Unit (PCU)** which, following the POSAF I approach, will subcontract NGOs (depending on their capacity) as co-executing agencies (CEAs) to do the field work. The PCU will be completely independent administratively and financially, reporting directly to the Minister—that arrangement having been one of POSAF I's successful features. As conditions precedent to the first disbursement the PCU must have been set up and its Director and core staff appointed, the MARENA/INAFOR agreement must have been signed, and the program's Operating Regulations must have been adopted.

B. Structure of the PCU and coordination of the program

- 3.4 The program's implementation apparatus consists of three committees, the central PCU with its five area offices, and NGOs. The highest authority will be a **National Executive Committee** composed of the Environment Minister (MARENA), the Director General of INAFOR, representatives of MAG/FOR, the Rural Development Agency, the Association of Nicaraguan Municipalities, and the CEAs, and the PCU Director who will be the committee secretary. Formation of the Executive Committee will be a condition precedent to the first disbursement. Its terms of reference are to: (i) approve the program's annual work plans, budgets, and Operating Regulations; (ii) oversee the PCU's work and the program's progress; (iii) give final approval for project proposals submitted by CEAs; and (iv) coordinate closely with sector agencies and settle problems arising between the program and CEAs or other participating institutions that cannot be resolved at a lower level.

- 3.5 The second-level body is a **Central Technical Committee** made up of MARENA's Director for Protected Areas, the INAFOR representative who will work out of the PCU as part of its staff, and three PCU officers (one of the unit's economists and two of its technical officers). This committee's mandate is to review project proposals received from PCU area offices to assess their technical, socioeconomic, financial, and environmental feasibility before adding them to the program's work plans for presentation to the Executive Committee.
- 3.6 At the third level, as the first point of contact with the program in the regions, are five **Local Technical Committees**, one for each office through which the program will be executed. These committees will be the intake point for project proposals submitted by NGOs, to check that they satisfy all the rules and criteria in the program's Operating Regulations. They will consist of a representative from: (i) city hall, (ii) CEAs operating in the watershed, (iii) beneficiaries, and (iv) the MARENA, INAFOR, Rural Development Agency (IDR) and POSAF II area representatives.
- 3.7 The PCU will coordinate the program and be in charge of its overall execution—planning, project approval, contracting, disbursements, monitoring of CEAs and preparation of reports for MARENA, INAFOR and the Bank. INAFOR's area offices will also be participating, as will MARENA's Protected Areas Directorate and Environmental Education Division. These responsibilities will be performed following the operational procedures outlined below for the program's execution, which are set out in the Operating Regulations.
- 3.8 The PCU will be divided into three units and five area offices:
- a. **Planning and Monitoring Unit.** This unit will be staffed by one officer in charge of administering training activities and seminars, another officer to operate the SIMOSE monitoring system, and an economist. The latter two officials will maintain and monitor the SIMOSE and compare its findings against the program's Logical Framework and indicators therein, to set the stage for an evaluation when the program ends and an assessment of its impact on beneficiaries and watersheds.
 - b. **Technical Unit.** This unit's team will consist of a forestry expert transferred from INAFOR, an agroforestry expert, a civil engineer, and an environmental economist. They will conduct formal technical reviews of every project proposal that CEAs and municipalities have submitted to the POSAF II area representatives and which the latter have recommended to the Local Technical Committees, evaluating the proposed plans, activities, extension agent time requirements, and expected outcomes. The environmental economist also will review projects' financial viability and make sure that the evaluation indicators on which the CEAs propose to report match SIMOSE requirements.
 - c. **Financial Management Unit.** This unit will be in charge of all contracting, disbursements to CEAs in accordance with the regulations, the program accounts

and financial statements, and other program logistics. Its team will consist of a chief financial administrator, an accountant, a procurement and contracting expert, and administrative support staff.

- d. **Five area offices.** There will be PCU area offices in the target watersheds, each with a coordinator and one assistant. In addition, three technical officers will be hired to assist the five offices depending on the workload in each and the volume of requests received by each representative. These offices will be the first appraisal point for proposals received and will forward them to the central PCU with the Local Committee's recommendation. The bulk of their duties will involve supervising CEAs' work in the field, making sure that the outcomes these agencies report were in fact achieved.

3.9 The PCU also will have a part-time legal counsel to review contracts with CEAs and municipalities. As an innovative feature of POSAF II, a project expert will be hired with the loan funds to provide additional support, specifically to assist the Bank specialist in charge of monitoring the project on field visits to assess CEA performance, help the Central Technical Committee and Local Technical Committees with project appraisals, including the Atlantic Region pilot projects, and assist the PCU in clarifying issues involving the program's regulations, securing the Bank's approval.

3.10 The structure described here differs from the POSAF I setup in several respects: (i) there will be heavier representation on the committees from MARENA directorates, municipalities, and INAFOR; (ii) the technical evaluation of projects has been strengthened (in the technical elements per se and looking at outcomes); (iii) the evaluation and monitoring system will be strengthened not just from a benchmarking standpoint (indicators against which the program's success and coverage will be gauged) but also featuring a more direct link with the Bank, and (iv) MARENA's and INAFOR's regional apparatus will be bolstered with direct strengthening activities and by involving the area offices in the program's implementation. The experience gained in the course of the program will leave the Protected Areas Directorate better equipped as to management planning methods and protected areas management; the Environmental Education Division will be coordinating its current activities with those of POSAF II and, above all, work in the regions will be better coordinated with municipalities.

C. Operational procedures

3.11 The first of the program's activities is to promote POSAF II, to keep producers interested and apprised of changes in this operation and of INAFOR's role in the process. The PCU will conduct this activity directly.

3.12 **Component I. Farm management subcomponent.** Drawing on the experience acquired by the PCU in POSAF I, a list was compiled of CEAs with proven project execution capacity, through which the POSAF II activities could be launched. Other CEAs could be added to the list once the PCU had accredited them on the

basis of evaluation criteria that came out of specific recommendations received from two consultancies. During the promotional phase CEAs would be informed about POSAF II and the new rules and target areas, and would be invited to take part by submitting project proposals based on producer demands. This participation option will be open not just to CEAs on the present list but to any such agency that satisfies the prescribed criteria. If two CEAs present projects in overlapping areas the PCU will evaluate the proposals, looking at their technical content and the assistance services being offered. In principle, CEAs will be competing on the basis of quality of technical services offered and not cost, since payment amounts to CEAs will be set in advance. Nevertheless, preference will be given to agencies that have already worked, with a good track record, in the POSAF II target areas.

- 3.13 A CEA will submit its proposal, prepared in accordance with the program regulations, to the POSAF II area representative. The proposal must provide all the prescribed information such as number of participating producers, eligible activities selected, the total incentive (calculated on the basis of the activities), cost of technical assistance (using the selected differential rate, including the incentive), expected outcomes, monitoring indicators according to SIMOSE stipulations, and financial information presentation as required by the PCU for project accounting. Each producer will sign a contract with the CEA that will be delivering the services, setting out both parties' obligations. As one contractual condition, producers will undertake to return the incentives they receive to the CEA if they fail to execute the agreed works and adopt new practices on their parcels.
- 3.14 Before operations begin the CEAs will receive training on two fronts: (i) short training courses and seminars on on-farm activities included in the component, and (ii) training from the PCU on the form of presentation of information required for project monitoring and accounting and for the eventual evaluation against the SIMOSE indicators.
- 3.15 The POSAF area representative will evaluate the project proposal, conferring with the INAFOR representative for forestry-related matters. When the two officials have verified that the information submitted is complete and have cleared the project according to the program criteria they will forward the proposal to the Local Technical Committee with their recommendation. When that committee has cleared the project it will be sent on to the PCU for review by a technical officer who will then forward it, with recommendations, to the Central Technical Committee. The difference between the two approval steps is that at the local and Local Technical Committee level the emphasis will be on criteria, project activities, costs, payment rates, conditions, and content, and adherence to the regulations, whereas the Central Technical Committee (which will check the same items) will concentrate on the project's technical and financial viability. When this latter committee has given final approval the project will be added to the work plan for submission to the Executive Committee at its next meeting.
- 3.16 The INAFOR representative's involvement is crucial to make sure that forest management plans are approved according to INAFOR rules and avoid the kind of

delays that came up in POSAF I. The INAFOR representative at the central PCU will also be consulted during this process.

- 3.17 As an important additional provision for projects to be implemented in a protected area, the POSAF II area representative will check that the farm plans are concordant with the general management plan for the protected area in question and secure clearance from the MARENA area representative. That agency's Director for Protected Areas, who sits on the Central Technical Committee, will step in to resolve any issues arising during this process.
- 3.18 One of the representatives' key tasks in their reviews is to make sure that the farm plans presented in project proposals are cohesive and that the sum total of proposed activities encompassed by the total incentive authorized for the producer are representative of that plan. In other words, a producer cannot request a single activity or only two activities for the total allowed incentive if those activities are not consonant with a technically viable plan for the farm. A system also will be instituted to have producers sign CEA field visit reports to confirm that the visits took place and the assistance was delivered.
- 3.19 The area representatives will oversee CEA and project activities through field visits and meetings with producers and with CEAs. The representatives and the PCU Director will together map out a work plan in advance regarding inspection and field visits and interviews with producers, issuing monthly reports on the quality of CEA performance and outcomes. Beneficiaries will be surveyed each year to assess the technical assistance services delivered. The final payment to CEAs will be made on the basis of outcomes agreed on by the PCU and CEA in accordance with the SIMOSE and Logical Framework indicators, through a field inspection after three years of technical assistance delivery.
- 3.20 The average cost of technical extension services would be approximately US\$152/producer/year. This is a reasonable amount, in absolute terms and relative to the planned investments, when compared to costs of similar programs in Nicaragua. The total POSAF II technical assistance cost is higher than in POSAF I because it covers an additional year and includes a performance incentive for CEAs. However, there will be a commitment from the producer to contribute 10%, on average, of the technical assistance cost in year 3 of the program. The Operating Regulations specify a differential rate schedule for producers in areas that are remote or present other access problems.
- 3.21 For farms located within a protected area the CEA will first assure that there is a general management plan for the area, and then will organize area producers and help them come up with farm plans, presenting them as a project. This will be a condition for proceeding with the other communal investments in the protected area, which can be executed by the same CEA or by others who bid on the contract.
- 3.22 **Protected areas subcomponent.** The PCU will tender out equipment purchases and small infrastructure works included in this subcomponent, as well as other

needed investments that come out of the general management plans. However, such investments will be executed only when area producers have presented proposals via a CEA through a formal tender for a project for participation in component I of the program. The Protected Areas Directorate, as a co-executing agency, will be in charge of specialized training and environmental education in these areas. It will submit annual work plans to the PCU for those two elements and will receive the requisite funding transfers for that task. It must account for one transfer before receiving another.

- 3.23 **Atlantic Region pilot projects subcomponent.** Because of this region's complicated institutional apparatus and geography, project proposals will be reviewed case by case to see if they are technically, economically, financially, socially, and institutionally viable so as to keep risks to a minimum. Projects will be monitored and evaluated by MARENA and INAFOR area offices in the North Atlantic and South Atlantic autonomous regions, which will receive additional funds for the purpose.
- 3.24 The Operating Regulations contain the rules for CEA preselection and for selecting projects for funding in the Atlantic Region, based on profiles submitted by NGOs, academic institutions, producers' trade associations, etc. The key factor in CEA preselection is the agencies' experience in similar projects in this particular region.
- 3.25 **Component II.** Applications for mitigation structures and small infrastructure works will be submitted by municipalities or NGOs representing the latter. To be eligible, works projects must be included and ranked as priorities in municipal development plans and approved by municipal councils. To qualify as a priority, a project must: (i) offer protection for populated areas; (ii) be part of a municipal disaster prevention and mitigation plan; (iii) be consonant with the component I works, and (iv) afford clearly identified benefits. Applicants must furnish all the information required by the Operating Regulations, including a description of anticipated environmental impacts.
- 3.26 If the works will be on private property, producers must submit their applications to the respective regional council that will forward them to the municipality. Any such project will be executed under an agreement between the producers and the municipality.
- 3.27 Applications from municipalities will go through the same approval process as component I projects. After the PCU approves a proposal it will call for bids and award the contract to a private company or NGO that has the required expertise. The municipality will be responsible for supervision and maintenance of the works unless, in the PCU's assessment, it does not have the requisite capacity, in which case an NGO or company can be hired for that task.
- 3.28 For each works project the municipality must contribute at least a 10% counterpart, in money or in materials, if its population is under 10,000 and at least 20% if the population is over 10,000.

- 3.29 **Component III.** This component consisting of institutional and municipal strengthening activities, studies, and environmental education will be executed largely by the PCU. Equipment and vehicles will be purchased through calls for bids along with the other vehicles the PCU needs, for distribution to their assigned destinations. In-house workshops for the agency representatives will be handled directly by the PCU trainer and the various MARENA departments responsible for them. The PCU will contract out training for CEAs to specialized agencies such as the Tropical Agricultural Research and Higher Education Center (CATIE), the Sustainable Hillside Farming Program (PASOLAC), and the Technical Forestry Agency (INTECFOR), following the procedure described in chapter II. Municipal courses and training will likewise be contracted out, based on a plan to be developed by the PCU training officer and agreed on with the recipient agencies.
- 3.30 Implementation of the Monitoring and Evaluation System (SIMOSE) will be based on two POSAF-funded consultancies in late 2001, one to develop a baseline against which future outcomes will be measured and the other to come up with terms of reference for tendering out the SIMOSE contract itself and final indicators that will be part of the system as benchmarks against which the PCU will gauge the program's impact and the reports the CEAs will be delivering. The PCU will call for bids for the SIMOSE proper once the program is declared eligible. To make sure that this system is duly implemented a consultant will be hired for two years to run it and train the PCU in its operation. The Bank's Country Office will closely monitor this entire process to ensure that the evaluation is concordant with the Logical Framework content.
- 3.31 MARENA-related studies will be tendered out directly by the PCU; bids for those pertaining to INAFOR will be solicited by that agency which will report thereon to the PCU. The benefiting directorates will be responsible for reviewing the terms of reference and execution of the studies.
- 3.32 The environmental education activities will be put out to bid and their execution will be overseen by MARENA's Environmental Education Division, receiving only the necessary inputs budgeted for in the program. The contract for the mass campaign will be awarded to a private company or NGO following a call for proposals. Formal environmental education courses will be delivered by a university under an agreement; nonformal education activities will be bid out in multiple contracts by subject area and delivered by specialized agencies.

D. Flow of funds

- 3.33 The funds flow and disbursement system developed during POSAF I was found to be quite expeditious, and was one reason for that program's success. In POSAF II, the IDB and NDF funds will be channeled through the Ministry of Finance and the Central Bank directly to separate POSAF II bank accounts, reflected in a line item for the program in the MARENA budget. Counterpart funds will be channeled through the Finance Ministry to MARENA for deposit into a separate bank account in the program's name. The PCU will be required to: (i) keep complete and accurate

accounting and financial records of the program that can identify sources and uses of program funds to satisfy Bank requirements; (ii) prepare disbursement requests, submit them to the Bank, and account for program-eligible expenditures; and (iii) submit other financial reports requested by the Bank.

- 3.34 When the investments pertain to INAFOR the PCU will transfer the equipment and vehicles as soon as the contracts are awarded. For studies and training, on the basis of terms of reference and an annual training plan furnished by INAFOR the PCU will transfer the funds to that agency, to a separate account, for execution and subsequent accounting for these activities.

E. Procurement

- 3.35 Contracts for works, goods and related services, and consulting services for the program will be tendered and awarded in accordance with Bank procurement policies and procedures. Thresholds at which international competitive bidding will become mandatory are: (i) US\$1 million equivalent for works and (ii) US\$250,000 equivalent for goods and associated services. International calls for proposals will be required for consulting contracts worth more than US\$200,000 equivalent.
- 3.36 Procurement of goods and works contracting below the aforementioned thresholds will be governed in principle by Nicaraguan law provided it is concordant with Bank policies.

F. Investment timetable

- 3.37 The program will run for five years. Year 1 disbursements will be 18.6% of the total, to launch an intensive promotional campaign, train CEAs, purchase equipment, and execute 15% of the on-farm investments. This plan will be updated annually or more frequently in consultation with the Bank. In that same year 26% of the NDF funding will be disbursed to be able to start the SIMOSE study.

Table III-1. Investment timetable (US\$000)						
Source	Y E A R S					Total
	1	2	3	4	5	
FSO	5,800	6,700	8,400	6,700	5,100	32,700
NDF	900	500	400	300	900	3,000
Local	300	600	500	500	400	2,300
Total	7,000	7,800	9,300	7,500	6,400	38,000

G. Evaluation, monitoring, and audits

- 3.38 The planned POSAF II monitoring and evaluation system will be an improvement over its POSAF I counterpart because it will incorporate recommendations that

have come out of various evaluations. First and foremost, CEAs will be given specific training about the type and quality of information they should be tracking and forwarding to the PCU for its database. The area representatives' role will be more technical than administrative: following a prearranged field-visit schedule they will check, on each farm and with each producer, what services the CEAs have been delivering and the information received from them before it is sent on to the PCU.

- 3.39 Since the proposed operation entails numerous decentralized payments of large amounts it will use the method of ex post review of documentation on program-funded expenditures and disbursement requests presented to the Bank. The PCU and co-executing agencies must keep careful files and cross-references of that documentation for inspection visits by Bank staff and reviews with the program's external auditors. In addition, the consultant hired as a link with the Bank will assist the PCU in field inspections, ad hoc reviews of project proposals received and approved for funding, and monitoring of consultants' work for prospective Atlantic Region projects that will operate under more flexible rules than the rest of component I.
- 3.40 The key monitoring tool will be the SIMOSE, bolstered by a full-time consultant engaged for two years to install and operate the system and train the PCU to maintain the socioeconomic and environmental indicators agreed on ex ante as part of the system design and compared against a baseline, and with the support of an environmental economist assigned permanently to the PCU. With these indicators a better impact assessment can be done and CEA performance can be tracked for incentive payments at the end of year 3. Two evaluations also are planned, one a midterm review on the strength of which the program might be adjusted and a final evaluation at the end of year 5 to confirm and compare results with the SIMOSE in operation.
- 3.41 Annual operational audits with semiannual reviews will be conducted to examine: (i) adherence to the Operating Regulations and operational performance of the delivery system; (ii) the procurement process; (iii) disbursement requests; (iv) compliance with contractual clauses; (v) status reports on the revolving fund and the bank accounts through which the program funds are handled, and (vi) other reports requested by the Bank. Within 120 days after each fiscal year-end the PCU is to provide the Bank with a report on the annual operational audit of the program. Within 30 days after the end of each calendar half-year the PCU will send the Bank the semiannual review report. In addition, the program's annual financial statements must be presented to the Bank within 120 days after the fiscal year-end, after being audited by a public accounting firm acceptable to the Bank. External audit costs will be defrayed using the loan funds. The selection and hiring process to engage the independent audit firm, including terms of reference for the proposed audit work, will require prior Bank review and approval.

IV. BORROWER AND EXECUTING AGENCY

A. The borrower and the executing agency

- 4.1 The borrower will be the Government of Nicaragua. The executing agency will be the Ministry of the Environment and Natural Resources, with the participation of the National Forestry Agency (INAFOR) for forestry-related elements.

B. Ministry of the Environment and Natural Resources (MARENA)

- 4.2 MARENA was created in 1994 pursuant to the law governing IRENA (the Nicaraguan Natural Resources and Environment Agency, MARENA's predecessor). After a reorganization and reshuffling it became the sector's policy-making, planning, and policy and strategy coordinating body for natural resources conservation and development matters, including watershed-based resources management. MARENA was reorganized again in 1998 with the passage of Law 290 that shifted full responsibility for forestry matters to INAFOR.
- 4.3 One fruit of MARENA's successive restructurings was the paring of its staff complement from roughly 1,300 in its complex 1994 setup to 650 in 1996 and to 454 in 2001—the latter reduction largely owing to staff transfers to INAFOR. Over that interval MARENA, with the help of various donors and organizations including the IDB, has become an agile institution and achieved some major organizational goals.
- 4.4 Today MARENA is divided into four general technical directorates—Environmental Quality, Biodiversity and Natural Resources, Protected Areas, and Regional Coordination. The latter department oversees the work of all MARENA's area representatives. Among the agency's support units is a planning bureau that takes in the Environmental Education Division and the Financial Management Division. Through these offices MARENA has put out a number of technical standards on environmental quality and controls, such as those governing pollution from sewage discharges, slaughterhouses and sawmills and vehicle emission standards. Two important contributions of the Protected Areas Directorate (DGAP) are its published regulations on protected areas and a management-plan methodology. That unit will be working in the World Bank-funded PROTIERRA project to develop policies and rules whereby municipalities will be put in charge of managing Municipal Ecological Parks. During POSAF I the IDB participated in this process with funding for two co-management plans and assistance to train park rangers, with good results.
- 4.5 To integrate its operations, MARENA adopted a policy of decentralization and integration of activities of donor-funded internal projects within its structure. The Bank will apply that same policy during POSAF II: the environmental division will coordinate and oversee the work of the various environmental training providers;

the DGAP will approve all management plans in protected areas and receive capacity-strengthening and other support for studies and methods.

- 4.6 Assisting MARENA with these activities and contributing to their success are about 15 projects, 12 of them funded by grants from European countries for conservation and strengthening activities in protected areas and one World Bank loan and two IDB loans (one of them for POSAF I). The agency's heavy reliance on such projects is evident in its roster of personnel, more than 60% of whom are paid with grant funding. MARENA's budget is fairly modest, at US\$17.8 million for 2001 (1.62% of the national budget), 17% of it provided by loans and 62% by grants. A drying up of funding flows in future thus would have serious consequences.
- 4.7 The POSAF II project will improve MARENA's methods and instruments and train its current staff but, once completed, it would entail no budgetary requirement which could have repercussions later. At the end of year 5 MARENA could incorporate certain elements of the PCU within its own organization to continue to build in-house capacity. The program's average annual operating budget is about US\$6 million, or 33% of MARENA's current budget. To judge from experience, there should be no problem in expending that sum.

C. National Forestry Agency (INAFOR)

- 4.8 INAFOR was created pursuant to Law 290 that took MARENA's former National Forestry Directorate and made it the core of the new institution. Operating under the Ministry of Agriculture and Forestry (MAG/FOR), INAFOR is headed by a Director General who reports to the Minister. Its policies and strategies are mapped out in the National Forestry Commission (CONAFOR) which operates as an executive board. INAFOR is divided into three operational departments—Forestry Development, Forestry Regulation, and Regional Operations Oversight, support units, and the Genetic Improvement Center and Seed Bank that is reporting little activity at present.
- 4.9 INAFOR has had a succession of directors since its 1998 inception. As a result of this turnover, the fact that the forestry bill (still in the Assembly) has yet to be passed into law, and a heavily centralized policy approach the agency has been ill-equipped to solve problems relating to the country's forest resources and manage them soundly. Since 2000 INAFOR has had to deploy virtually all its resources to combat a pine weevil infestation that has ravaged the nation's pine forests. Nevertheless, it has launched a reorganization starting with a decentralization strategy (the result of a World Bank-funded consultancy) that is seeing headquarters staff transferred to the area offices, with delegated authority for operations and decision-making. Previously, for instance, forest management plans had to be approved by headquarters, often delaying the implementation of forestry projects—POSAF I among them. With the new organizational approach such plans will be reviewed and approved at the area-office level. In addition, work is under way to standardize a system for application of the Municipalities Act whereby INAFOR must transfer a portion of logging tax proceeds to the municipalities.

These transfers have been making for better communications between INAFOR and the municipalities and in the future will heighten municipal involvement in forest conservation.

- 4.10 INAFOR has 225 field staff (51% of the total), only 27 of whom (12%) are paid for with external funds—far below the MARENA figure of over 60%. INAFOR thus offers better prospects for institutional stabilization and operational improvements. It is now implementing two small projects and is involved in the PROTIERRA operation being executed by MAG/FOR, in forestry research and forest management projects, and in initiatives to foster private enterprise. INAFOR's budget is derived solely from forestry taxes and charges that brought in about US\$1.3 million in 2000—too little for effective area operations. The hope is that the POSAF II-supported forest management activities will push up the agency's revenues.
- 4.11 POSAF II will do a great deal to strengthen INAFOR in the form of operating assets, studies, staff training, and better coordination with municipalities. It also will allow for direct participation in the program both centrally and in the regions where area delegates are an integral part of its implementation. By the end of the program the capacity of field personnel will be substantially enhanced, equipping them in particular to review and approve forest management plans.

V. VIABILITY AND RISKS

A. Technical viability

- 5.1 The activities that POSAF II will foster have proven to be technically viable during POSAF I, using appropriate technology that has shown itself to be efficient in other countries to achieve objectives similar to the POSAF II aims. The techniques being advocated are demonstrably suited to rural Nicaragua and readily appropriable by area campesinos. The minor difficulties encountered in the course of POSAF I have nothing to do with its technical viability.
- 5.2 The proposed municipal engineering works are unsophisticated and involve standard designs; the materials are readily available on the market. Similar designs have been used and similar works built elsewhere in Central America with the same features as those planned for this program.

B. Environmental viability

- 5.3 The findings of the environmental assessment done of the program were summarized in an environmental brief. The following would be the program's most beneficial environmental and social impacts: (i) improved land use; (ii) slowing of the rate of deforestation; (iii) reduction of erosion and thus less productive-soil loss and silting of water bodies; (iv) more plant cover (primarily trees) on 47,000 hectares and a concomitant increase in biomass and atmospheric carbon dioxide capture; (v) better streamflow regulation; (vi) greater public awareness of environmental issues to prevent water pollution caused by wastes and farm chemicals; (vii) the creation of environmentally sustainable economic opportunities; (viii) a diminished risk of natural disasters and mitigation of socioeconomic and environmental impacts when such events do occur; and (ix) more financially sustainable management of protected areas as the private sector becomes a partner in co-management arrangements and an enabling environment for ecotourism development is created.
- 5.4 As for potential adverse impacts, there is a possibility that watershed and natural resources planning and management methods and techniques, or those needed for civil works design, siting, and construction, might not be properly applied. The environmental elements built into the municipal works identification, preparation, execution, and evaluation afford assurances that those projects will be viable. Financial, human, and material resources for the environmental protection measures will be provided for in each POSAF II component. To keep environmental risks to a minimum the program would fund the preinvestment studies necessary for municipal works; furnish technical assistance and training for all facets of the planned activities; promote sustainable production systems, and train producers to avoid the use of harmful farm chemicals that, though banned internationally, are

still in frequent use in Nicaragua. The monitoring and evaluation activities are the program's tool to make certain the proposed technologies are appropriately applied.

- 5.5 The operation's environmental and social strategy aim is natural-resources conservation by introducing sustainable production systems, targeting poor areas in which environmental damage is particularly severe (IIA-IIC). The focuses are agricultural and forestry production, natural disaster prevention and mitigation, and institution-strengthening. The participatory method to be used (paragraphs 2.16 to 2.18) will equip beneficiaries to develop and implement their farm plans more intensively and make them more environmentally sustainable and economically viable. To track the program's performance and environmental and social impacts, the SIMOSE monitoring system (paragraphs 2.33, 3.8, 3.30 and 3.40) will be strengthened and improved. It will monitor progress by reference to Logical Framework indicators (to be refined with the baseline study) and by monitoring targeted microwatersheds and control microbasins. The main environmental eligibility criteria for farms will be land-use capability and degradation, vulnerability to disasters and hazards, location relative to critical or protected areas, compliance with environmental legislation, and environmental services. The planned environmental education and training (paragraphs 2.35 to 2.37) will strengthen integrated environmental management to help achieve the project's objectives and anticipated outcomes. The key instruments will be information and awareness-raising campaigns, seminars, workshops and courses. Two cross-cutting elements in the training are a gender perspective and occupational safety and health. Both will be intrinsic parts of the planned activities and issues dealt with, since they can yield benefits for the family circle and for society at large.

C. Institutional viability

- 5.6 POSAF II's institutional viability rests largely on enhancements to the POSAF I apparatus by way of the following:
- a. Legal changes so MARENA and INAFOR can execute an agreement making INAFOR an integral part of the project rather than treating it as a separate agency. This will make clear each agency's involvement and responsibilities and also serve to strengthen INAFOR so it can perform better, particularly in the regions, integrating its activities with those planned for component I of the program.
 - b. PCU structural adjustments to improve the interface with MARENA's Protected Areas Directorate and Environmental Education Division. MARENA staff working in areas that directly impact the program will be more involved both at headquarters and in the area offices.
 - c. Application of lessons learned on the operating-procedures side. POSAF II will promote on-farm activities on the basis of their technical viability rather than

simply higher incentives. Since the remuneration of co-executing agencies (CEAs) will be calculated on the basis of services per producer with a fixed incentive, activities can be selected on technical grounds and not because of monetary considerations. Furthermore, the use of differential rate schedules will be an incentive to CEAs to work on behalf of producers living in remote and sparsely populated areas.

- d. Better integration of work in the regions between the agencies and their area representatives. The project approval and supervision work will require cooperation by all representatives of the participating agencies.
 - e. A better monitoring and evaluation model than the POSAF I version, by virtue of a system whereby: (i) CEA performance can be assessed; (ii) the program's impact can be assessed by reference to indicators, and (iii) there will be a direct link with the Bank.
 - f. The regulations devised for POSAF II are an improvement over POSAF I, making for smoother administrative and operating procedures in the regions.
- 5.7 Two significant benefits in addition to those listed above regarding the proposed mechanism will be improved coordination not just between the agencies involved but also with municipalities, and the experience that MARENA and INAFOR's staff and organizational apparatus will gain and put to use in future projects.

D. Financial viability

- 5.8 The object of the financial viability analysis was to verify that: (i) during the first three years as a program participant, applying the new systems and activities, a producer would receive a large enough materials subsidy (up to two years) and technical assistance (three years) to be able to earn an income equal to or higher than his or her present figure, and (ii) after three years, producers who have adopted the practices introduced by the various program-advocated systems will be earning more, so their living conditions will improve, they can overcome their aversion to change and to the associated risks and, above all, so they can personally contract and pay for assistance when they need it.
- 5.9 As part of this analysis each of the proposed systems was examined, looking at the investment outlays needed to instill the new practices, including technical assistance costs paid to CEAs (treated as subsidies offered through the program) and producers' labor, which was considered to be their contribution. The incentives were calculated on the basis of input, material, and technical assistance needs with a cap of US\$1,300 per producer (the individual per-hectare incentives by system are specified in the Operating Regulations).
- 5.10 Another factor considered was the producer's total output increment at farm-gate prices. Without-project calculations were done first to ascertain the producer's

current situation, followed by with-project estimates to verify that the outcomes—counting the input subsidy and technical assistance—would indeed raise producers' incomes and standard of living by the end of the program.

- 5.11 The analysis done on the basis of POSAF I outcomes showed that agroforestry systems operated by small producers on small parcels returned the best results because of their superior yields and product complementation, which more than doubled producers' income as of the third year and left them clearly in a position to pay for future technical assistance. Though these were the most requested systems in POSAF I they still account for only 20% of the total acreage and 58% of the total number of farms. Silvopastoral systems produce equally healthy returns thanks to productivity increases, particularly for fruit trees. These farms represent only 12% of the estimated program total.
- 5.12 Forest management systems account for 30% of the estimated total number of farms but nearly half the program acreage. Though the results overall were positive there were earnings differences depending on the system. Looking at a 20-year horizon the best systems are industrial reforestation and woodlot management, which yield similar results. However, since forest management produces a more stable cash flow, producers who opt for that system can subsist and grow. Industrial reforestation, on the other hand, requires timber harvesting in specific years and thus is better suited to mid-sized producers who have other sources of income. The fuelwood reforestation system also offers good prospects, though it brings in less income than the other two; however, its purpose is to give the producer an energy source in the field, ease the pressure on forest resources to satisfy energy needs, and cut down on indiscriminate harvesting of trees for that purpose. Individual flows for these systems are described in technical annexes in the program files.
- 5.13 One conclusion that can be drawn from the foregoing is that any linear combination of these systems based on the minimum prescribed parcels will also be financially viable. Technical assistance agents thus will have the flexibility to propose the best combination of systems to a producer, with due regard to the characteristics of the parcels and the producer's preference. A second conclusion is that the system whereby producers would gradually increase their cofinancing share—receiving investment funding plus technical assistance in year 1 (contributing only labor), less investment funding plus technical assistance in year 2, 10% of technical assistance costs in year 3 but paying all investment costs personally, and from year 4 onward paying the entire investment and technical assistance cost as needed—is likewise workable (see Operating Regulations).

E. Socioeconomic viability

- 5.14 Producers in the POSAF II area of influence stand to gain the most from the program, in the form of sustainable crop productivity increases and a shift in production toward more profitable crop lines. The majority of these benefits will

stem from new farming or forestry practices introduced on the land of producers who participate directly in the program. However, the natural disaster prevention and mitigation structures and training and capacity-building for natural resources management will yield considerable benefits as well. These activities will help raise incomes and living standards of the entire rural population in the program's area of influence. Apart from the direct gains for participants the program will yield positive externalities: an increase in plant and forest cover and less pollution of water sources in the program's area of influence.

- 5.15 **Component I: Sustainable natural resources management.** For this analysis projections were run of the total acreage the program will cover each year for each of the seven proposed production systems. The total increase in value of output of participating producers' holdings was calculated, net of production-cost increases, additional capital costs, the total cost of technical assistance services, and this component's share of the cost of administering and implementing the program. Shadow wages of unskilled labor were factored in, given the high unemployment rate for unskilled labor, as well as shadow prices for internationally traded inputs and goods to offset distortions in the equilibrium exchange rate on account of tariffs on imported goods and services.

Table V-1. Component I. Economic rate of return (%)	
At market prices	17.1
At economic prices	
• -10% output value	14.8
• +10% investment and technical assistance costs	14.3
• Both	12.3

- 5.16 The economic internal rate of return (IRR) findings confirm that this component will yield acceptable socioeconomic returns. The sensitivity of the program IRR to changes in key variables was examined as well. The IRR was found to be robust to a 10% drop in prices for agricultural outputs and a 10% increase in the cost of investments and technical assistance services.
- 5.17 Atlantic Region pilot projects. Given the serious institutional shortcomings observed in this region, the chief concern will be to identify project proposals that afford solid assurances that the executing agencies involved have the requisite capacity. Experience gained in the selected pilot projects will pave the way for a future presence of the POSAF program in this part of the country, with interventions that can achieve strong socioeconomic and environmental impacts, with due regard to the constraints facing this particular region.
- 5.18 **Component II: Community works for natural disaster prevention and mitigation.** POSAF I funded a study to ascertain the economic benefits that would accrue from disaster prevention and mitigation works. The study found that the soil

and silt retention benefits from the various structures to be funded with the US\$4 million budgeted for component II would be worth US\$8.4 million, not counting river works. To this we could add other benefits from reducing the need to maintain and repair infrastructure and housing, but these were not factored in because of a lack of reliable data. To judge from these data, the POSAF II component that will yield the highest return is municipal works.

- 5.19 **Component III: Capacity-building and training for natural resources management.** Given the nature of this component a conventional cost-benefit analysis is not warranted. It will yield indirect economic benefits primarily by making the other program components operate more efficiently.

F. Community involvement

- 5.20 To make certain that the priorities and expectations of the program's target population are taken into account and that the mechanisms devised for their participation in the different program components are appropriate and workable, a consultation exercise was conducted with a representative sample of communities and the general public in the program's areas of influence.
- 5.21 The consultation findings were the basis for specific recommendations formulated during the feasibility study. They have been built into the design of the POSAF II components and of mechanisms to ensure continuing community and institutional involvement in the program's execution and supervision. Community participation will be heightened in the course of the program, with special emphasis on ethnic communities. To achieve synergies, coordination arrangements will be worked out with other IDB-supported projects on the Caribbean coast—among them the Atlantic Coast Development Program (NI-0107, loan 1051/SF-NI). Grass-roots organizations and NGOs will be used as co-executing agencies to that end, with support for the formation or strengthening of local watershed committees.

G. Gender focus and women's participation

- 5.22 Women play a significant role in production and in the resulting farm economy in the target area. POSAF II will help secure women's participation by adopting a gender perspective in every facet of every component, making sure that women participate actively in natural resources management and environmental training and education. Specifically, the program will foster promotional activities, education, the adaptation of appropriate technologies in the form of more fuel-efficient woodstoves, and protected-areas management, among other initiatives. There will be specific efforts in the planned technical assistance to address the needs of women producers and heads of household. Men and women alike will be encouraged to join in the community projects to prevent and mitigate natural disasters. The program also will promote women's active involvement in

investment projects and will lay emphasis on both spouses' signing family-farm finance agreements.

- 5.23 Since the handful of women's organizations currently operating in these watersheds are fairly weak, the program will take particular care to design training events tailored to these groups, within the general framework of the program's objectives.

H. Program risks

- 5.24 One potential risk would be inadequate cooperation between the two participating agencies that could delay project approvals and project implementation generally. To allay that risk the needs of each institution have been examined, the necessary strengthening activities and measures have been built into the program, and each agency's tasks have been spelled out in the Operating Regulations.
- 5.25 Since the proposed program advocates technology change to make for more rational use of natural resources with a watershed focus, there is a possibility of producer bias as far as adapting the offered technologies and systems is concerned and inappropriate application of the various systems' technologies. To counter this technological risk POSAF II will continue to implement the enhanced technical assistance model so that CEAs and beneficiaries will become familiar with and master techniques associated with the respective production systems.
- 5.26 Since the POSAF II priority subbasins are so vulnerable there is a risk of hydrometeorological events that could trigger flooding, landslides and mass movements and cause environmental degradation. This would leave area residents at even greater environmental risk and could hold up the achievement of the program's objectives and targets.
- 5.27 Watershed management planning is viewed as a valuable tool to contend with this potential for weather events and their consequences and lessen the associated risks, and also for managing soil, water, and plant resources. The mitigation structures envisaged in component II will also help ease the risk of natural disasters.

NICARAGUA

SOCIOENVIRONMENTAL AND FORESTRY DEVELOPMENT PROGRAM (NI-0141)

LOGICAL FRAMEWORK MATRIX

OBJECTIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
the socioeconomic and environmental conditions of priority watersheds in	<ul style="list-style-type: none"> Agroforestry GDP increases more rapidly in the priority watersheds and growth is more stable than previously. 	<ul style="list-style-type: none"> Regional breakdown of National Accounts 	
sustainable improvements in socioeconomic conditions and quality of life of priority watersheds.	<p>By the end of the program the following targets have been achieved:^{a/}</p> <ul style="list-style-type: none"> After three years of program interventions, per-hectare agroforestry and forestry income is up more than 100% on the targeted parcels. Within five years there is more plant cover on 47,000 hectares in the targeted subbasins. In five years the erosion rate in targeted microbasins is lower than in control microwatersheds. In five years, groundwater and surface water pollution in the targeted microbasins is lower than in control microwatersheds. 	<ul style="list-style-type: none"> Impact assessments Baseline study 	<ul style="list-style-type: none"> No natural disasters devastate targeted microbasins.

Indicators will be refined in accordance with the findings of the baseline study to be completed by the start of the program.

BRIEF SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
I: Sustainable natural resource management environmentally sustainable and attractive production systems developed.	The timetable for introducing environmentally sustainable production practices is adhered to, and by the end of the program: <ul style="list-style-type: none"> • 14,150 producers have been assisted. • 310,000 hectares are being managed by way of farm plans. • Investments in new practices for which the program offered incentives take in 77,700 hectares. • 3,000 energy-saving stoves have been installed. 	<ul style="list-style-type: none"> • PCU progress reports, midterm review, program completion report 	<ul style="list-style-type: none"> • MARENA and INAFOR coordinate effectively. • There are stable, attractive markets for the products being promoted.
II: Community works for watershed prevention and control executed in the framework of watersheds' management	By the end of the program there are: <ul style="list-style-type: none"> • 50 municipal works completed. 	<ul style="list-style-type: none"> • PCU progress reports, midterm review, program completion report 	<ul style="list-style-type: none"> • Municipal authorities and communities participate in POSAF projects. • Environmental authorities foster natural disaster prevention mitigation actions.
III: Capacity-building and management of natural resources Residents are educated and environmental elements of integrated watershed	By the end of the program there are: <ul style="list-style-type: none"> • 200,000 people trained in watershed management topics. • 500 technical agents and employees trained in integrated watershed management techniques. 	<ul style="list-style-type: none"> • PCU progress reports, midterm review, project completion report 	<ul style="list-style-type: none"> • Environmental authorities promote POSAF projects.
IV: Sustainable natural resource management investments in protected areas Region pilot projects	<ul style="list-style-type: none"> • US\$20,250,000 • US\$18,000,000 • US\$2,200,000 • US\$1,500,000 	<ul style="list-style-type: none"> • PCU progress reports; project completion report 	<ul style="list-style-type: none"> • PCU receives the requisite from the government. • The government furnishes counterpart contributions

ATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<p>II: Community works for disaster prevention and</p> <p>al works</p>	<ul style="list-style-type: none"> • US\$4,000,000 	<ul style="list-style-type: none"> • PCU progress reports; program completion report 	<ul style="list-style-type: none"> • PCU receives the requisite from the government. • The government furnishes counterpart contributions c
<p>III: Capacity-building and natural resources</p> <p>nal capacity-strengthening</p> <p>mental education</p> <p>forest fire prevention</p>	<ul style="list-style-type: none"> • US\$3,500,000 • US\$2,500,000 • US\$250,000 • US\$550,000 • US\$200,000 	<ul style="list-style-type: none"> • PCU progress reports; program completion report 	<ul style="list-style-type: none"> • PCU receives the requisite from the government. • The government furnishes counterpart contributions c

**Procurement
(US\$000)**

Item	Amount	Form of tendering	YEARS				
			1	2	3	4	5
Vehicles	356	INT	356	-	-	-	-
Office equipment	130	NAT	130	-	-	-	-
Field equipment ^{a/}	248	NAT	180	68	-	-	-
Other equipment	148	NAT	60	60	28	-	-
	882		726	128	28	-	-
Works ^{b/}	4,000	NAT	368	747	2,143	742	-
SIMOSE study	712	INT	712				
Feasibility studies	500	INT					500
Miscellaneous studies ^{c/}	479	NAT	180	155	50	94	-
	1,691		892	155	50	94	500
Training	347	NAT	60	70	70	70	77
TOTAL	6,920		2,046	1,100	2,291	906	577

NOTES:

^{a/} Field equipment: Miscellaneous tools, supplies and equipment that it would be impossible to obtain from one or two suppliers.

^{b/} Works: Local tenders between US\$20,000 and US\$100,000. If the Municipality of Managua were to request works up to US\$200,000 an international call for tenders could be held.

^{c/} Training and miscellaneous studies: Numerous courses and seminars costing between US\$5,000 and US\$50,000. Given the array of topics and activities, the maximum that could be packaged in the training activities would be about US\$100,000.

INT International
NAT National

PROPOSED RESOLUTION

**NICARAGUA. LOAN ____/SF-NI TO THE REPUBLICA DE NICARAGUA
Social-environmental and Forestry Development Program II
(POSAF II)**

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 Social-environmental and Forestry Development Program II (POSAF II). Such financing will be for the amount of up to US\$32,700,000, 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.