



Board of Executive Directors

For consideration

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8 November 2005

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From: The Secretary
Subject: Brazil. Proposal for a loan for a social and environmental program for the igarapés in Manaus

Basic Information:
Borrower State of Amazonas
Amount up to US\$140 million
Source Single Currency Facility of the Ordinary Capital

Inquiries to: Mr. Manuel Pizarro (extension 1869)

Remarks: For purposes of the Bank's disclosure of information policy, the paragraphs which are identified [in brackets] are confidential.

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BRAZIL

SOCIAL AND ENVIRONMENTAL PROGRAM FOR THE IGARAPÉS IN MANAUS

(BR-L1005)

LOAN PROPOSAL

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ABBREVIATIONS

AEIS	Área especial de interesse social [special area of social interest]
ARSAM	Agência Reguladora dos Serviços Públicos do Estado do Amazonas [Regulatory Agency for Public Services in the State of Amazonas]
ECP	Environmental control plan
EIA	Environmental impact assessment
EIRR	Economic internal rate of return
EMTU	Empresa Municipal de Transportes Urbanos [Municipal Urban Transportation Company]
ICAS	Institutional Capacity Assessment System
IMPLURB	Instituto Municipal de Planejamento Urbano [Municipal Institute of Urban Planning]
IPAAM	Instituto de Proteção Ambiental do Amazonas [Environmental Protection Institute of the State of Amazonas]
MANAUSTUR	Fundação Municipal de Turismo [Municipal Tourism Foundation]
PROSAMIM	Social and environmental program for the igarapés in Manaus
SEDEMA	Secretaria de Desenvolvimento e Meio Ambiente [Municipal Department of Environmental Protection]
SEINF	Secretaria de Estado de Infra-Estrutura [Department of Infrastructure]
SEMOSB	Secretaria Municipal de Obras e Saneamento Básico [Municipal Department of Works and Basic Sanitation]
SEMULSP	Secretaria Municipal de Limpeza e Serviços Públicos [Municipal Department of Sanitation and Public Services]
SUFRAMA	Superintendência da Zona Franca de Manaus [Office of the Superintendent of the Manaus Customs-free Zone]
SUHAB	Superintendência da Habitação do Amazonas [Office of the Superintendent of Housing]

Proposed resolution

Electronic Links and References	
Basic socioeconomic data	http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata
Status of loan in execution and loans approved	http://ops/approvals/pdfs/BRen.pdf
Procurement plan	http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=622844
Other documents (links	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=543596

PROJECT SUMMARY

BRAZIL

SOCIAL AND ENVIRONMENTAL PROGRAM FOR THE

IGARAPÉS IN MANAUS

(PROSAMIM)

(BR-L1005)

Financial Terms and Conditions ¹				
Borrower: Government of the State of Amazonas		Amortization period:		25 years
Guarantor: Federative Republic of Brazil		Grace period:		6 years
Executing agency: PROSAMIM Management Unit		Disbursement period:		6 years
		Start of works:		4 years
Source	Amount (US\$)	%	Interest rate:	Libor
IDB (Ordinary Capital)	140 million	70%	Inspection and supervision fee:	0%
Local	60 million	30%	Credit fee:	0.25%
Total	200 million	100%	Currency:	U.S. dollars
Project at a Glance				
<p>Project objective:</p> <p>To help solve the environmental, planning, and social problems affecting Manaus residents living in the Educandos-Quarenta watershed. The specific objectives are: (i) to improve environmental and health conditions in the zone through the rehabilitation and/or installation of drainage systems, the provision of drinking water, the collection and disposal of wastewater and solid waste, and environmental remediation at the headwaters; (ii) to improve housing conditions for the people who reside in the zone through land use planning, registration and titling of land, adequate housing solutions, creation of recreational areas, and environmental and health education for the local population; and (iii) to build the operational and management capacity of the entities involved in the program, as well as their capacity to incorporate community participation into the decision-making process.</p> <p>Special contractual conditions:</p> <p>Conditions precedent to the first disbursement: (i) staff the Management Unit with a team of experts (paragraph 3.2); (ii) create the program for the recovery of economic activities affected by PROSAMIM (paragraph 3.25); and (iii) put the Operating Regulations for the program into effect (paragraph 3.27). Conditions precedent to the tender of program works in a specific area: (i) prepare and approve an environmental control plan (paragraph 3.21). Conditions precedent to the award of contracts for the construction of works in a specific area: (i) submit evidence of legal ownership of land and rights-of-way (paragraph 3.10). Conditions precedent to the start of program works in a specific area: (i) the Amazonas state government must enter into an agreement with Águas do Amazonas for the execution of the water and sanitation component in the respective area (paragraph 3.12); and (ii) affected families in the area have been resettled (paragraph 3.23). Three months after the loan contract is signed: (i) put the manual of administrative and financial procedures into effect (paragraph 4.9). Six months after the loan contract is signed: (i) hire the specialized consulting firm to support the</p>				

¹ The interest rate, credit fee, and inspection and supervision fee mentioned in this document are established pursuant to document FN-568-3 Rev. and may be changed by the Board of Executive Directors, taking into account the available background information, as well as the respective Finance Department recommendations. In no case will the credit fee exceed 0.75%, or the inspection and supervision fee exceed 1% of the loan amount.*

* With regard to the inspection and supervision fee, in no case will the charge exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

Management Unit (paragraph 3.2). **Twelve months after the loan contract is signed:** (i) evaluate the new organizational structure of the PROSAMIM Management Unit using the Institutional Capacity Assessment System (ICAS) (paragraph 4.10) **Fourteen months after the loan contract is signed:** (i) review implementation of the resettlement plan for the representative sample (paragraph 3.26). **Other conditions:** (i) conduct a midterm review of the program (paragraph 3.38); (ii) deliver a midterm report and a final report (paragraph 3.38); (iii) maintain the works built under the program (paragraph 3.33); (iv) deliver audited financial statements for the special account (paragraph 3.36); and (v) an agreement on the allocation of income from each project or group of projects must be signed three months before acceptance of the respective water and sanitation works (paragraph 3.12).

Exceptions to Bank policies:	None.				
Project consistent with country strategy:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Project qualifies as:	SEQ <input checked="" type="checkbox"/>	PTI <input checked="" type="checkbox"/>	Sector <input type="checkbox"/>	Geographic <input type="checkbox"/>	Headcount <input checked="" type="checkbox"/>
Verified by CESI on:	6 May 2005				

Environmental and social review: Based on the project report, the summary of the strategic environmental evaluation, and the summary of the resettlement plan, the Committee on Environment and Social Impact determined that the recommendations recorded in the minutes of the 7 May 2004 meeting had been sufficiently implemented, and approved the program.

Procurement: The procurement of goods and related services, as well as consulting services, will be subject to Bank tender policies and procedures. International competitive bidding will be used where the estimated cost of works is ten million dollars (US\$10 million) equivalent or more, and where the cost of goods or services is five hundred thousand dollars (US\$500,000) equivalent or more. International competitive bidding will also be used for all consulting contracts valued at five hundred thousand dollars (US\$500,000) equivalent or more. Goods and services will be procured in accordance with the procurement plan presented in Annex III-1. Because the executing agency has no prior experience, supporting documentation for the procurement of goods and services will be reviewed ex ante.

I. FRAME OF REFERENCE

A. The urban problem

- 1.1 Manaus, the capital of the state of Amazonas on the shores of the Negro River, is facing a number of urban problems associated with rapid, chaotic urban expansion. The city's population quintupled between 1970 and 2003, from just over 300,000 people to slightly over 1.5 million, a much faster growth rate than experienced by other cities in the country in the same period. This growth went hand in hand with the expansion of production-oriented, commercial activities associated with the creation of a customs-free zone and the development of public services and government operations. The city is home to more than half of the state's inhabitants and generates close to 90% of its gross geographic product.
- 1.2 Manaus straddles two watersheds: the São Raimundo and the Educandos-Quarenta, which have areas of 10,625 and 3,834 hectares, respectively. Approximately 580,000 people live in the Educandos-Quarenta watershed (the most densely populated), where the heart of the city, the oldest part of Manaus, was built. The urban area of Manaus is crisscrossed by streams called igarapés. The igarapés drain into larger tributaries or directly into the Negro River and are affected when the Negro River rises. When heavy rainfall causes the Negro River to flood, water levels can rise up to 14 meters. The highest levels occur in June and July, flooding the lower reaches of the igarapés. In the Manaus area, the heaviest and most frequent rains fall between November and May, when the level of the Negro River is low to moderate.
- 1.3 Manaus's rapid population growth has not been accompanied by the necessary infrastructure investments or controls on land use and settlement. This, in combination with a dearth of affordable urban housing alternatives, especially for low-income groups, has led to the emergence of squatter settlements, with makeshift housing built on untitled land in environmentally sensitive areas, in particular along the igarapés. The population is so dense along some stretches of the igarapés that the waterways have been completely obstructed by stilt houses accessed by footbridges. The people who live in these houses are subjected to recurrent flooding and the structures are at risk of collapse whenever the current becomes sufficiently swift. In the Educandos-Quarenta watershed, it is estimated that nearly 7,000 families (36,000 people) are at risk. The watershed also has the most washouts and landslides per year and the highest rates of waterborne disease.
- 1.4 The settlement of these highly environmentally sensitive areas, which are unsuited for urban development, poses an environmental, urban planning, and social problem for the city. It creates negative externalities for the downtown area (flooding, stench, mosquitoes, and rodents), which leads to the deterioration and abandonment of adjacent areas with an attendant drop in revenue and real estate values, spurring the decay of buildings and adjacent public spaces. Moreover, using these areas for housing creates environmental problems (risk of flooding and

landslides) and social problems (high incidence of gastrointestinal diseases, social exclusion) for those living on the igarapés, and directly or indirectly affects all of the city's residents, who must pay the price of support and emergency services to mitigate the negative impacts.

- 1.5 Almost all the homes in the at-risk areas have unreliable access to electricity and water services, and most connections to these services have been illicitly rigged. Raw sewage and some garbage is dumped directly into the igarapés, hindering their drainage capacity. Area families not affected by the flooding suffer the negative effects of humidity, rotting garbage, and a proliferation of mosquitoes and rats. As a trade-off, these families live in homes in the heart of the city, close to jobs and public education and health services.
- 1.6 In 2002, the município of Manaus, which is responsible for regulating land use, approved the urban development master plan. In accordance with city bylaws (federal law), the plan calls for the designation of Special Areas of Social Interest (AEIS) to facilitate the subdivision of land at low cost and provide low-income groups with access to housing.¹ The regulations implementing the plan will be drafted by the Municipal Institute of Urban Planning (IMPLURB), the município's advisory body on urban development issues. The município, through the Municipal Department of Sanitation and Public Services (SEMULSP), is responsible for waste collection and disposal.
- 1.7 In 2002, the município of Manaus awarded a concession contract to a private firm, Águas do Amazonas, to provide water and sanitation services. The contract sets forth the water and sanitation coverage objectives, and stipulates that the concessioning authority may make water and sanitation investments to accelerate the fulfillment of those objectives. The concessioning authority has delegated contract management and supervision to the Regulatory Agency for Public Services in the State of Amazonas (ARSAM). Águas do Amazonas will operate and maintain the water and sewer investments called for under this program. The financing and subsequent cost recovery of program investments will be part of a financing arrangement consistent with the concession contract (see 3.11 and subsequent paragraphs).
- 1.8 The institutional mechanisms in place for the delivery of basic services and land use have not succeeded in solving the problems created by the squatter settlements. In particular, water and sewer services are not available in many of the affected areas, and the IMPLURB has not developed a registry and titling program for existing

¹ In these areas, less stringent standards than in the rest of the city will be applied to the subdivision of land for residential use, and the ongoing construction of infrastructure and higher population densities will be permitted, all of which will help bring down the cost of land.

settlements or an effective policy to expand the supply of developed plots for residential use at prices affordable to low-income groups.

B. The state government's strategy

- 1.9 The current administration of the Amazonas state government is proposing, in coordination with the município, a broad set of activities and interventions to address the social and environmental problems affecting the igarapés. Investments totaling approximately US\$500 million will be made over a period of 12 years, which will require systematic planning and effective community participation, with the works presented in this document constituting the investments with the highest priority and greatest importance for dealing with the problems affecting Manaus's igarapés. The município has started implementing policies to minimize the risk of new squatter incursions along the igarapés. These preventive policies revolve around an increase in the supply of low-cost housing and the oversight and control of sensitive areas. The designation of AEIS by the Manaus município will boost the supply of low-cost land for residential use. Low-income families will thus have access to affordable developed land, which will reduce the emergence of new squatter settlements. Moreover, the município has stepped up supervision and control of sensitive areas to prevent new squatter incursions. This program will mark the beginning of the activities described above.
- 1.10 The state and municipal levels of government coexist in Manaus. As a result, both levels work in an interrelated way, vis-à-vis the population, to solve problems that affect the functioning of the city, regardless of which level is legally mandated to address a given problem. This is the case with the reclamation of the igarapés, where both levels of government are responsible to the community. Although the município is legally responsible for addressing the problem, it does not have sufficient resources to make the sizable investments required. However, it has been carrying out small-scale works, typically in response to emergencies, to mitigate the problem. Because the city of Manaus is home to more than half of the state's population, the Amazonas state government also feels a responsibility to deal with the igarapé problem. Several attempts at collaboration between the Amazonas state government and the município were made in the past to address the problem, but were unsuccessful due to the absence of an explicit demonstration of their willingness to work together. The two levels of government have now signed an agreement in which the Amazonas state government has committed to finance the necessary works by furnishing the local counterpart contribution and repaying the loan and the município has pledged responsibility for the subsequent operation and maintenance of the works. Because there are legal provisions preventing the Amazonas state government from paying for works executed by another subnational entity, it must also execute the works planned under this program.
- 1.11 Because the Amazonas state government, through the Department of Infrastructure (SEINF), executes a wide variety of works throughout the state, and because the

state will not maintain in perpetuity these types of urban works, which are ultimately municipal works, an executing agency was specifically created for this program. The executing agency will be dissolved at the end of project execution unless the state-município cooperation continues and a new phase is introduced.

C. The Bank's strategy and lessons learned in the sector

1. The Bank's country strategy

- 1.12 The Bank's country strategy with Brazil (document GN-2327) sets three objectives for the Bank's cooperation with the country: (i) to promote sustained, stable, and environmentally sustainable growth; (ii) to reduce poverty, promote social inclusion, and enhance social and regional equity; and (iii) to support institution-strengthening and promote democracy and citizen participation.
- 1.13 To meet these objectives, the Bank will focus its cooperation on four areas: (i) productivity of small and medium-sized enterprises and infrastructure, with priority given to public-private partnership models for new investments; (ii) poverty, equity, and human capital formation, with a focus on programs for income distribution; (iii) living conditions and efficiency in cities, integrating measures to fight urban poverty with improvements in habitability, efficiency, and environmental quality; and (iv) modernization of the State and institution-strengthening, with an emphasis on subnational governments.
- 1.14 This program addresses the first and second objectives of the Bank's country strategy and falls under the third and fourth areas of activity. The operation will help: address problems related to environmental management and natural resources, as well as reduce poverty and social inequities. It will also contribute to the reform and modernization of the public sector, inasmuch as it calls for activities to strengthen the public agencies involved in the program, enhancing their capacity to steer the city's urban development, build infrastructure, and promote affordable housing alternatives for low-income groups.

2. Lessons learned

- 1.15 There is a wealth of experience in Brazil dealing with urban problems related to sanitation, drainage, and the environment. Examples include drainage improvements in Rio de Janeiro, environmental sanitation in Bahía de Todos los Santos, and sanitation in Belém do Pará. The country also has considerable experience addressing problems of squatter settlements. Several programs in execution that have been partially financed by the Bank, such as Favela Bairro in Rio de Janeiro, have received international recognition as good practices. The strategy of these programs revolves around: the full incorporation of squatter settlements into the city through efforts to address their environmental problems and weak infrastructure and services; the registration and titling of real property;

and the integrated execution of all interventions. The program design takes into consideration the lessons learned from these and other, similar projects, specifically:

- a. The participation and coordination of local entities in the program should be agreed and clearly defined. This program calls for agreements to be signed between the Amazonas state government and all participating entities. The agreements will clearly state the obligations and responsibilities of the parties in a way that leaves no room for doubt and ensures that future state and municipal administrations will recognize and duly honor their commitments, reducing the risk of program activities being abandoned (see paragraph 3.5).
- b. Land should be titled and registered to provide the beneficiaries with the security they need to invest in their properties, and the land use plan should give low-income groups access to formal-sector housing. Under this program, land belonging to close to 2,000 families will be titled and registered, and AEIS will be established to make land available for low-income housing (see paragraph 2.3(b)).
- c. The final designs or, in their absence, advanced basic designs (including topography, geotechnics, and interference identification) should be available at the start of construction, to prevent delays and cost overruns. For this program, advanced basic designs have been drawn up for an amount greater than 50% of the direct costs (see paragraph 3.7).
- d. The execution of works should be accompanied by environmental and health education activities to promote the proper use of the investments and acceptance of service rates and fees. This has been taken into consideration in the design of this program (see paragraph 2.4(c)).
- e. Resettlement plans should provide a detailed description of the activities required for implementation, and should be discussed and approved by the community. For family resettlement projects, an action plan should be developed in good time for expropriating land, purchasing new property, and designing housing solutions, including urban infrastructure. Participation by the affected families and the representative institutions builds trust between the affected community and the resettlement teams, making it easier to prepare and implement resettlement plans. The resettlement plan for families adversely affected by the works included in the program's representative sample was developed on the basis of these premises, which will also guide the terms of reference for planning and carrying out other resettlements under this program (see paragraphs 3.23 and 3.24).

D. Program strategy

- 1.16 The program strategy is to comprehensively address the environmental, urban planning, and social problems resulting from squatter settlements along Manaus's igarapés. This strategy is based on four groups of activities, two of which are remedial in nature, and two of which are preventive. The first group consists of macro and micro drainage systems to regulate the impact of heavy rainfall and the floodwaters of the Negro River. The second consists of resettling igarapé residents in areas that have been zoned for residential use and have access to basic services. This second measure will ease the social problems affecting this population, while restoring the drainage function of the igarapés. The third group consists of the construction of avenues and parks in the areas most vulnerable to squatter takeovers, in order to prevent such takeovers from occurring. The fourth group of activities consists of expanding the supply of low-cost land zoned for residential use and greater monitoring and oversight of land use and settlement, in accordance with the master plan. This measure will provide Manaus residents with formal housing solutions in line with their ability to pay, and reduce incentives to adopt informal solutions.
- 1.17 The strategy, which has been developed for the entire city of Manaus, will be gradually deployed to ensure that activities are consistent and well planned, and to prevent widespread disturbance to the city. This program will finance the activities needed to address the problems affecting the igarapés in the Educandos-Quarenta watershed, where most of the squatter settlements are located, and represents one-third of the total estimated need (see paragraph 1.9). The experience gained through this program will serve to validate the strategy described above and inform the design and pace of future interventions.

II. THE PROGRAM

A. Objectives and description

1. Objective

- 2.1 The program objective is to help solve the environmental, planning, and social problems affecting the city of Manaus, particularly residents living in the Educandos-Quarenta watershed. The specific objectives are: (i) to improve environmental and health conditions in the zone through the rehabilitation and/or installation of drainage systems, the provision of drinking water, the collection and disposal of wastewater and solid waste, and environmental remediation at the headwaters; (ii) to improve housing conditions for the people who reside in the zone through land use planning, registration and titling of land, adequate housing solutions, creation of recreational areas, and environmental and health education for the local population; and (iii) to build the operational and management capacity of the entities involved in the program, as well as their capacity to incorporate community participation into the decision-making process.

2. Description

- 2.2 The program calls for activities and works in the watershed of the Educandos-Quarenta igarapé and its tributaries. Because the various works will be repetitive, the proposal is for a global multiple-works program. The works to be completed on the Manaus, Bittencourt, and Mestre Chico igarapés, which are tributaries of the Educandos igarapé, will constitute a representative sample. The program has two components, divided according to the nature of the interventions (works or institutional activities). Physical works are included in the first component. The second component consists of community development initiatives and institutional strengthening activities for the public agencies participating in the program.

B. Program components

1. Environmental, planning, and housing improvements (US\$154 million)

- 2.3 This component will finance the works needed to: (i) restore the drainage function of the igarapés; (ii) pursue urban renewal and resettle families adversely affected by the works; (iii) use reclaimed areas and improve the flow of traffic in the city center; and (iv) provide water and sanitation services to the resettled community and the population living in the igarapé watershed.
- a. **Macro and micro drainage.** This subcomponent calls for the construction of storm water drainage systems. Works will consist of protection of headwaters, protection of stream banks, construction and rehabilitation of culverts, creation

of protected and recreational areas, and the installation of stormwater galleries and collectors. The macro and micro drainage systems planned for the representative sample (US\$25 million) will consist of 1,620 meters of culverts, 3,744 meters of galleries, 300 meters of collectors, and 10 hectares of parks.

- b. **Urban renewal and resettlement.** This subcomponent includes the development of housing solutions for residents along the igarapés who are at risk of flooding, and for the population directly affected by the construction of program works. The housing solutions will be sited near the igarapés where the population currently resides; other relocation options will be offered to families who do not wish to remain in the area. Resettlement options will adhere to the guidelines established by the Amazonas state government and Bank policies. There are plans to register and title land in the areas adjacent to the igarapés and provide urban basic services to the population. Resettled families will receive assistance as needed through a resettlement adjustment program. Financing will be provided for a pilot program to renovate residential and commercial buildings near the igarapés in the city center, in order to identify effective, sustainable management and financing models that promote the restoration of buildings adversely affected by the environmental and social problems associated with the igarapés. Within the representative sample (US\$30 million), 1,845 families will be resettled and 1,500 properties will be titled and registered.
- c. **Parks and roads.** This subcomponent includes the construction of city parks on reclaimed land near the Educandos-Quarenta igarapés, to prevent resettlement along their banks and make it easier to maintain the waterworks built there. This component will increase the amount of green space in the city center, where it is scarce. Roads will also be built to improve traffic flow in the program's area of influence. Within the representative sample (US\$15 million), 7,700 meters of road will be built.
- d. **Sanitation infrastructure.** This subcomponent will finance investments in water and sewer services for the resettled community and the population living in the watershed area. Sewage will be piped to a pretreatment plant before discharge into the Negro River via an existing underwater outfall. The service provider Águas do Amazonas will be responsible for operating the works. The works included in the representative sample, which have an estimated cost of US\$9.5 million, will consist of 3,350 meters of pipeline for drinking water, 4,960 meters of interceptor sewers, 65,890 meters of collector sewers, and two pumping stations. These works will provide 1,845 families with drinking water and 31,175 families with sewer services.

2. Social and institutional sustainability (US\$5 million)

- 2.4 This component will improve the operational and management capacity of the entities involved in program implementation and the subsequent operation and

maintenance of program works, as well as promote effective community participation in creating the conditions for the program activities to be sustainable:

- a. **Community participation (US\$300,000).** A plan that addresses community concerns has been developed to actively involve the communities affected directly or indirectly by the program. This subcomponent will support implementation of this plan throughout program execution.
- b. **Awareness campaigns (US\$300,000).** This component will support the ongoing awareness campaign plan to publicize the program. The plan calls for an Internet portal (www.prosamim.am.gov.br) and a hotline for the general public.
- c. **Environmental and health education (US\$1 million).** This subcomponent will be implemented as the works are being built, so that the affected communities understand the benefits of the investments and how to properly use and maintain them, and agree to pay for the basic services they receive. The portion of this subcomponent that corresponds to water and sanitation services will be executed directly by the concession holder.
- d. **Institutional development (US\$3.4 million).** An analysis was performed of the capacity of the public entities that will be responsible for regulating urban development and for operating and maintaining program works. Based on this analysis, a plan was developed at each institution to address its weaknesses and capitalize on its strengths. This subcomponent will provide the financing needed to implement these plans. The following areas of activity have been identified:
 - (i) *Land use planning (US\$300,000).* This area of activity will help the Municipal Institute of Urban Planning (IMPLURB) establish the legal procedures and rules governing the Special Areas of Social Interest (AEIS), identify programs for formalizing the settlements, and prepare a comprehensive strategy to deal with squatter settlements in the city.
 - (ii) *Industrial pollution control (US\$1 million).* This area of activity will help the Environmental Protection Institute of the State of Amazonas (IPAAM) implement the industrial pollution control plan at the municipal level. Of the 180 plants located in the Educandos-Quarenta igarapé watershed, nearly 153 will be monitored. These plants were selected based on their discharge volumes and types of contaminants. The remaining plants will use the public sewer system to discharge their household wastewater.
 - (iii) *Solid waste (US\$1.5 million).* Financing will be provided to develop a master plan for solid waste disposal for the Município of Manaus,

including medical and hazardous waste. Activities are also planned to promote recycling, especially in the program area.

- (iv) *Flood forecasting (US\$600,000)*. Financing will be provided to develop a flood forecasting plan and contingency plan for rainfall that exceeds the capacity of the hydraulic works, as a way of supporting the Civil Defense in its efforts to minimize the impact of flooding, in addition to improving the flood forecasting system for the Negro River.

C. Cost and financing

- 2.5 The total cost of the proposed program is US\$200 million, broken down by source of financing and investment category in the table below.

Cost and financing (in thousands of U.S. dollars)					
Categories		IDB	Local	Total	%
I	Engineering and administration	11,400	3,100	14,500	7.25%
1.1	Executing agency	0	3,100	3,100	1.55%
1.2	Management and supervision of works	8,900	0	8,900	4.45%
1.3	Studies and projects	2,500	0	2,500	1.25%
II	Direct costs	126,100	32,508	158,608	79.30%
2.1	Environmental, urban planning, and housing improvements	118,657	31,681	150,338	75.17%
2.1.1	Macro and micro drainage	54,600	4,500	59,100	29.55%
2.1.2	Urban renewal and resettlement	45,000	11,500	56,500	28.25%
2.1.3	Parks and roads	10,500	9,900	20,400	10.20%
2.1.4	Sanitation infrastructure	8,557	5,781	14,338	7.17%
2.2	Social and institutional sustainability	7,443	827	8,270	4.14%
2.2.1	Community participation	2,000	0	2,000	1.00%
2.2.2	Awareness campaigns	300	0	300	0.15%
2.2.3	Environmental and health education	700	0	700	0.35%
2.2.4	Institutional development	4,443	827	5,270	2.64%
III	Associated costs	2,500	1,500	4,000	2.00%
3.1	Audits, evaluations, and monitoring	2,500	0	2,500	1.25%
3.2	Land	0	1,500	1,500	0.75%
IV	Financial costs	0	22,892	22,892	11.45%
4.1	Interest during construction	0	22,256	22,256	11.13%
4.2	Commitment fee	0	636	636	0.32%
4.3	Inspection and supervision	0	0	0	0.00%
Total		140,000	60,000	200,000	100.0%
Percentages		70.0%	30.0%	100.0%	

- 2.6 The terms of the loan, made from the Bank's Ordinary Capital resources, would be as follows: (i) variable interest rate; (ii) annual commitment fee of 0.25% of the undisbursed balance; (iii) disbursement period of six years; (iv) grace period of six years; and (v) amortization period of 25 years. The Amazonas state government will provide the local counterpart contribution out of its own budgetary resources.

III. PROGRAM EXECUTION

A. Borrower, guarantor, and executing agency

- 3.1 The borrower will be the Amazonas state government, and the executing agency will be the Management Unit of the Social and Environmental Program for the Igarapés in Manaus (PROSAMIM). The Federative Republic of Brazil will be the guarantor for the operation.

B. Program execution and management

1. Executing agency

- 3.2 The Amazonas state government has created the Management Unit within the governor's office as the entity responsible for program execution. According to the regulations implementing the law establishing it, the Management Unit will have operational autonomy and a staff consisting of a manager and a small, multidisciplinary team of highly skilled experts, who will work exclusively on the program in the following areas: (i) administration and finance; (ii) engineering; (iii) social issues; (iv) environmental issues; (v) legal issues, including land and property titling, contracts, and agreements; (vi) relations with other entities involved in the program (the município, Águas do Amazonas, the Office of the Superintendent of the Manaus Customs-free Zone (SUFRAMA)); and (vii) procurement. The Management Unit will have the support of a consulting firm specialized in project management and works supervision. The firm will be selected through an international bidding process and will provide the technical personnel needed to support the Management Unit. **As a condition precedent to the first disbursement of the loan proceeds, the Management Unit's team of experts must be hired. The consulting firm specializing in management must be hired within six months after the loan contract is signed.**
- 3.3 The Management Unit will have the following main duties and responsibilities: (i) prepare bidding documents, publish calls for bids, evaluate proposals, and make award recommendations to the Amazonas state government's General Bidding Commission; (ii) draft contracts and arrange for their signing; (iii) review and approve projects and studies related to the PROSAMIM; (iv) supervise works and approve payment vouchers; (v) verify the eligibility of works and fulfillment of the requirements of the environmental control plan (ECP) and the resettlement plan; (vi) coordinate institutional strengthening activities with state and prefecture agencies; (vii) open separate, specific bank accounts to manage program resources related to Bank and local counterpart financing; (viii) maintain effective systems for the administration and payment of supplier and consultant contracts; (ix) maintain an effective financial accounting system for recording transactions involving program resources, and a corresponding internal control system; (x) prepare

disbursement requests and the respective expense vouchers; (xi) maintain an effective filing system of supporting documentation for eligible expenses, for verification by Bank personnel and external auditors; (xii) serve as the Bank's sole interlocutor in matters related to the PROSAMIM, and gather and maintain information for the Bank to conduct routine and special reviews.

- 3.4 [The decision to create the Management Unit within the governor's office was the result of an institutional assessment during program preparation. Originally, the program was to have been executed by the Amazonas state government's Department of Infrastructure (SEINF). But after the SEINF's institutional capacity to execute the program was assessed using the Institutional Capacity Assessment System (ICAS), it was determined that the executing agency should be transferred to a higher level of government. The principal findings of the ICAS analysis are described in Chapter IV (see 4.7 and subsequent paragraphs).]

2. Agreements

- 3.5 For program execution, the state will enter into agreements with the following entities, stipulating each parties' responsibilities: (i) the município of Manaus, including the Municipal Department of Works and Basic Sanitation (SEMOSB), which will maintain the drainage works, the Municipal Department of Sanitation and Public Services (SEMULSP), which will clean the parks and adjacent areas, the Municipal Department of Environmental Protection (SEDEMA), which will be involved in implementing the industrial pollution control plan, the Municipal Tourism Foundation (MANAUSTUR), which will manage the parks, the Municipal Urban Transportation Company (EMTU), which is responsible for traffic planning, and the Municipal Institute of Urban Planning (IMPLURB), which prepares land use planning studies; (ii) Águas do Amazonas, a private company that holds a concession to provide water and sanitation services in the município of Manaus, with the Regulatory Agency for Public Services in the State of Amazonas (ARSAM) to implement the water and sanitation component of the program; (iii) Manaus Energia, a federal public corporation that holds a concession to provide electricity services, with the intervention of the ARSAM, which will be responsible for installing street lighting; (iv) SUFRAMA, with the Environmental Protection Institute of the State of Amazonas (IPAAM), a state environmental agency, for implementation of the industrial pollution control plan; and (v) the Office of the Superintendent of Housing (SUHAB), a decentralized state agency that will be responsible for land purchases and expropriations. All of the agreements have been drafted, and so far the agreement with the município of Manaus, the memorandum of understanding with Águas do Amazonas, and the agreement with SUFRAMA have been signed.

3. Execution plan

- 3.6 The Educandos-Quarenta igarapé runs for 13 kilometers from the center of Manaus to the countryside, and many shorter igarapés flow into it. This will be the target area for the program, which will be executed as a global multiple-works program.

a. Representative sample

- 3.7 The advanced basic design has been prepared for the tendering of works for three of the igarapés that flow into the Educandos-Quarenta. Because these igarapés—Manaus, Bittencourt, and Mestre Chico—are located in the city center, efforts to rehabilitate them will benefit not only the current residents, but also the rest of the city, providing a significant demonstration effect. Planned works include: drainage systems; water and sewer services; roads; housing, including resettlement of families; and parks in reclaimed areas. Economic and social/environmental feasibility studies are also available for the project sample. Some of the igarapés in the watershed will not be targeted by the program because they are in protected areas or have already been the focus of reclamation and/or culverting activities by the município of Manaus.

Igarapés in the Educandos/Quarenta watershed included in the program	
Igarapé	Length (km)
Educandos	1.82 km
Quarenta	11.02 km
Manaus *	2.41 km
Bittencourt *	1.04 km
Mestre Chico *	2.42 km
Cajual	0.57 km
Liberdade	0.52 km
Cachoeirinha	2.27 km
Raiz	1.79 km
Sharp	0.69 km
Zumbi I	1.02 km
Zumbi A	0.94 km
Watershed total	26.51 km
Total length of the main igarapé (Educandos/Quarenta)	12.84 km
Total length of the tributaries	13.67 km

* Constitute the representative sample

- 3.8 With regard to the rest of the igarapés: the basic design has been drawn up for culverting of the Quarenta igarapé, and the finishing touches are being put on a final project design for the Cachoeirinha igarapé. For the other igarapés to be covered by the program, funds are available for the necessary studies and designs. The tendering process is already under way for works with an estimated value of US\$70 million on the igarapés included in the sample, including the resettlement of families. An international call for bids was issued in accordance with Bank rules. The deadline for the start of program works will be four years from the date on which the loan contract is signed.

b. Reclamation of the igarapés

- 3.9 The igarapés in the Educandos-Quarenta watershed that will be targeted by the program are listed in the table above. The reclamation works differ in terms of quantity and technology in each case, but are similar to the representative sample in these respects.
- 3.10 The execution of works on an igarapé begins with the resettlement of resident families, and then continues with culverting, drainage, earthmoving, bank compaction, and access roads. Construction then proceeds to water and sewer works (if required) and concludes with any necessary paving and parks and/or green spaces. **Prior to awarding any contract for the construction of program works, the Management Unit must demonstrate legal ownership of the land and rights-of-way.**

c. Water and sewer works

- 3.11 The Amazonas state government and Águas do Amazonas, with the participation of the município and ARSAM, signed a memorandum of understanding in January 2005 stipulating the terms and conditions for implementing projects under the water and sanitation component of this program. Recently, after negotiations between the Amazonas state government and Águas do Amazonas, an addendum to the memorandum was drafted, setting out the parties' duties and responsibilities with regard to the execution and financing of works. The principles set forth in the memorandum and addendum are as follows: (i) the Amazonas state government will be responsible for arranging for the designs and the works called for under the program's water and sanitation component; (ii) Águas do Amazonas, the concession holder, will be responsible for approving designs and supervising, receiving, operating, and maintaining the works; and (iii) the mechanism for allocating income generated by the projects will not alter the contractual targets of the concession or its financial equilibrium.
- 3.12 For the execution of each water and sanitation project, the Amazonas state government and Águas do Amazonas, as well as the município of Manaus with ARSAM as applicable, will sign two specific agreements in line with the memorandum of understanding and addendum: (i) an agreement on *works execution*, to govern the duties and responsibilities of Águas do Amazonas in the project approval process and its role in the execution and acceptance of works; and (ii) an agreement on the *use of project income*, to govern the allocation of income associated with the projects and the obligations that the parties must meet with regard to project-related income and expenses during the operation and maintenance phase. **The agreements for execution of each project or group of projects must be signed before the call for bids for the corresponding works is issued, and the agreements on the allocation of income from each project or**

group of projects must be signed three months before acceptance of the respective works.

- 3.13 So as not to alter the financial equilibrium of the concession, and to ensure that works are delivered to the concession holder that can generate income through rates without making investments, the income will be channeled into a special account to repay the financing of the works, and to make new investments. The agreement on the use of income for each project will govern the operation of this special account, to be called the “sanitation fund,” into which user fees for the sanitation services associated with the projects will be deposited.
- 3.14 Águas do Amazonas will have the following responsibilities: (i) supervise and approve the designs and supervise works execution; and (ii) deposit into the special account the user fees collected for sanitation services in all project areas, as soon as such services come online.
- 3.15 The income deposited into the special account will be used exclusively for the following commitments: (i) payments for management and operation of the account; (ii) payments related to the operation and maintenance of sanitation works in the project areas; and (iii) investments in the concession area or repayment of the debt associated with financing of the sanitation works in the project areas.

d. Social and institutional sustainability

- 3.16 The Management Unit, with the support of local nongovernmental organizations, will be responsible for activities related to community participation, awareness, and environmental and health education.
- 3.17 IMPLURB will consult with the specialized firm for the following three tasks: (i) survey of squatter settlements in the município; (ii) selection of the areas to be designated as areas of social interest; and (iii) control of public areas and land to prevent new squatter incursions. For these tasks, IMPLURB will be provided with the computer equipment needed to operate geographic information systems.
- 3.18 The industrial pollution control plan, under which 153 plants in the program’s area of influence will be monitored, has been developed. It will be implemented by IPAAM, with support from SEDEMA.
- 3.19 Consulting services will be engaged through an international competitive bidding process to develop a master plan for solid waste disposal for the city of Manaus. The master plan will incorporate a financing plan and a flood control plan that includes a contingency plan for flooding caused by extraordinarily heavy rainfall.

4. Environmental and social considerations

a. Environmental considerations

- 3.20 Based on the strategic environmental evaluation, IPAAM, in accordance with laws in force, has granted a preliminary permit for the interventions in the program's area of influence.
- 3.21 For the execution of works on each igarapé in the representative sample, an environmental impact assessment (EIA) and the corresponding ECP detailing the mitigating measures and their cost have been developed. **The ECP will form part of the works execution contract, and must be prepared and approved before the works are tendered.**

b. Community participation

- 3.22 Community participation is assured throughout the execution cycle of the works on each igarapé. The participatory process will be supported by a shared management model conceived specifically for the program and described in detail in the community participation plan (see paragraph 2.4(a)). The model presupposes: (i) an ongoing consultation process throughout all stages of the plan, with community participation in the identification of solutions and alternatives; and (ii) the establishment near each igarapé and in the new settlement areas of local offices staffed with multidisciplinary teams to support the resettlement process, including through awareness activities with the families. The community participation avenues identified in the plan are: (i) the shared management offices, whose purpose will be to provide a forum for dialogue between government and community representatives; and (ii) the committee of community representatives, which will serve as interlocutor between the communities directly affected by the program and the government, while coordinating community organization during the execution and post-execution phases, in an effort to assert the collective interests of the communities and secure the benefits expected from the environmental and social reclamation works on the igarapés.

c. Resettlement of families

- 3.23 The family resettlement plan provides four relocation options: (a) *construction of new homes*, which gives high priority to relocating families in the immediate area, on reclaimed land along the igarapés, ensuring access to existing services and social infrastructure; (b) *monitored resettlement*, which consists in providing subsidies and support to help families purchase and move into homes available on the local and regional market, by giving them a mortgage bond; (c) admission into public housing programs offered by the Amazonas state government and município of Manaus; and (d) *independent relocation*, which would provide cash compensation in accordance with the country's legal procedures and Bank policies, applicable in

the case of residents with full legal rights to their property whose social circumstances are such that they are able to handle their own relocation (see 4.35 and subsequent paragraphs). **Before civil works can be initiated on any igarapé, all families affected by the program must be resettled.**

- 3.24 The resettlement plan includes the creation of two funds, one for housing purchases and one to help people affected by the program reestablish their businesses. In the first case, the financing provided under the PROSAMIM resettlement plan will be channeled into a specific fund that will provide mortgage bonds to families interested in finding a house on the market. The amount of the bond is set at approximately US\$8,000. The rules governing the fund, as set forth in the program Operating Regulations, include the location and habitability conditions of the houses selected by the families and the eligibility criteria that families must meet in order to take advantage of this housing solution. The Amazonas state government has created this fund and put it into operation.
- 3.25 In the second case, program resources will be used to compensate families, microentrepreneurs, or microentrepreneur cooperatives whose economic pursuits have been adversely affected by the resettlement process by supporting: (i) the recovery of economic activities in the new settlements (economic reactivation program); and (ii) training activities, technical assistance, financing to set up and monitor the development of businesses run by families or microentrepreneurs working individually or organized into cooperatives (social inclusion support program). To this end, a program for the recovery of economic activities affected by PROSAMIM will be created at the Amazonas State Development Agency. The rules governing this program, as set forth in the PROSAMIM Operating Regulations, include the eligibility criteria that families, microentrepreneurs, and cooperatives must meet in order to access the resources and the list of economic activities identified as acceptable for establishment in residential areas. **The establishment of the program for the recovery of economic activities affected by PROSAMIM will be a condition precedent to the first disbursement.**
- 3.26 To minimize the risks associated with resettling families, **the Bank will review implementation of the resettlement plan 14 months after the loan contract is signed.**

5. Operating Regulations

- 3.27 Operating Regulations specifying the eligibility criteria for works and the expenses eligible for program financing have been drafted to guide the execution of works not included in the representative sample. The Operating Regulations describe, *inter alia*, the program execution structure, the terms of reference for the preparation of detailed designs, the economic evaluation methodology, the institutional strengthening plans, the environmental procedures for adding a new igarapé to the program, and the conditions under which the family resettlement

process must take place. **As a condition precedent to the first disbursement of the loan proceeds, Operating Regulations approved by the Bank must enter into force.**

C. Procurement

- 3.28 The procurement of goods and related services, as well as consulting services, will be subject to Bank tender policies and procedures. International competitive bidding will be used where the estimated cost of works is ten million dollars (US\$10 million) equivalent or more. International competitive bidding will also be used where the cost of goods and related services is five hundred thousand dollars (US\$500,000) equivalent or more. International competitive bidding will further be used for all consulting contracts valued at five hundred thousand dollars (US\$500,000) equivalent or more. Goods and services will be procured in accordance with the procurement plan presented in Annex III-1. Because the executing agency has no prior experience, supporting documentation for the procurement of goods and services will be reviewed ex ante.

D. Retroactive financing

- 3.29 The Amazonas state government has asked the Bank to recognize against the local counterpart contribution up to US\$35 million in expenditures made within the 18-month period prior to the approval of the loan proposal by the Bank's Board of Executive Directors, provided that such expenditures have been used in the preparation of projects included in the program, for consulting services in support of program preparation, or for execution of works on the Quarenta and Cachoeirinha igarapés. The procedures used to select and engage these consulting services and works were in accordance with Brazilian law and are substantially consistent with the Bank's policies for the procurement of works and goods.
- 3.30 The Amazonas state government has also asked the Bank to recognize as retroactive financing against the loan proceeds up to US\$1 million in expenditures for consulting services made within the 18-month period prior to the approval of the loan proposal by the Bank's Board of Executive Directors, for which the procedures used were in accordance with the Bank's policies for the selection and contracting of consultants.

E. Execution period and disbursement schedule

- 3.31 The following table presents the disbursement schedule for the program's six-year execution period:

Disbursement schedule by execution year

Source of financing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
IDB	5,000	25,000	35,000	40,000	20,000	15,000	140,000
Local	2,000	5,000	10,000	23,000	15,000	5,000	60,000
Total	7,000	30,000	45,000	63,000	35,000	20,000	200,000
%	3.5	15.0	22.5	31.5	17.5	10.0	

F. Maintenance of works

- 3.32 The drainage works that will be constructed as part of the program will be maintained by the município of Manaus, through SEMOSB, which has the material and financial resources to perform this task. Water and sanitation works will be maintained by Águas do Amazonas, the concession holder. Park maintenance will be the responsibility of MANAUSTUR, financed through leases on kiosks and businesses in the parks.
- 3.33 **The borrower will take such action as is necessary to ensure that the works constructed under this program are maintained in accordance with generally accepted technical standards and deliver an annual maintenance report to the Bank during the first quarter of every year through year four after the last disbursement.** If the reports or the Bank's inspection visits reveal substandard maintenance, the borrower will take such measures as it deems necessary to remedy the problems that have been found.

G. Revolving fund and external audits

- 3.34 In order to provide advances for activities to be financed with Bank resources, a revolving fund will be established in an amount of up to 5% of the Bank loan. The executing agency will deliver a semiannual report on the revolving fund to the Bank within 60 days after the end of each six-month period.
- 3.35 Throughout program execution, the Management Unit will deliver annual audited financial statements for the program, including the revolving fund, and semiannual audit reports. External audits will be conducted by independent auditors acceptable to the Bank, in accordance with the requirements of documents AF-100 and AF-300 and based on the terms of reference previously approved by the Bank (document AF-400).
- 3.36 Throughout program execution, beginning when the special account is opened (see paragraph 3.13), the Management Unit will submit audited financial statements for the special account on an annual basis. The external audit will be conducted by independent auditors acceptable to the Bank, in accordance with the requirements of documents AF-100 and AF-300 and based on the terms of reference previously

approved by the Bank (document AF-400). **The audited financial statements for the special account will be presented within 120 days after the end of the fiscal year.**

H. Midterm review and midterm and final reports

- 3.37 The Management Unit will prepare and deliver a midterm evaluation report to the Bank within 90 days after the date on which 60% of the loan proceeds have been committed or 36 months into the execution period, whichever occurs first. It will also prepare and deliver a final evaluation report to the Bank within 90 days after the date on which 90% of the loan proceeds have been disbursed. These reports will include: (i) financial performance outcomes by component; (ii) output and outcome targets met and progress toward achieving anticipated impacts, based on the indicators set in the program's logical framework; (iii) the degree to which the environmental requirements and specifications for works, as established in the respective ECP, have been met; (iv) the degree to which the operation and maintenance tasks on completed works have been performed; (v) a summary of social and environmental impacts, including reports on the family resettlement process; (vi) the degree to which contractual commitments have been fulfilled; and (vii) a summary of the findings of all audits conducted during program execution. Once the two evaluation reports have been accepted by the Bank, they will be posted to the PROSAMIM website for public dissemination. The evaluations will be done by consulting firms, which will be hired by the Management Unit and financed out of the loan proceeds. The reports, including supporting documentation and statistical information, will be available for any ex post evaluation.
- 3.38 A midterm review of the program will be conducted, based on the midterm report. This review will determine whether the logical framework indicators have been met, and gauge the overall progress of program execution. In the event that the review reveals the need for adjustments to the program, the executing agency and the Bank will reach agreement, within 60 days, on a plan to correct the problems identified. **The midterm review, midterm report, and final report will be contractual conditions.**

I. Monitoring and evaluation

- 3.39 A planning, monitoring, and evaluation system will be set up for the program under the responsibility of the Management Unit, and will include a database with information on program performance and impact indicators as specified in the logical framework (see Annex III-2). With this system it will be possible to: (i) monitor and oversee all igarapé projects; (ii) evaluate project impacts; and (iii) evaluate the effectiveness of the program, as well as that of the resettlement plan, integrating monitoring and ex post evaluation of the families affected by resettlement, based on specific indicators, such as changes in habitability standards, social integration, and the adoption of environmentally sustainable practices. The

system will be instituted at the Management Unit with the assistance of the supporting consulting firm.

- 3.40 Program monitoring will be done by the Bank's Country Office in Brazil. For monitoring purposes, the Management Unit will provide the Bank, as part of its initial report, with the final version of the annual work plan for program year one and a detailed program execution schedule. In addition, the Management Unit will deliver semiannual progress reports to the Bank, indicating output indicators met as established in the logical framework and the annual work plans.

J. Ex post evaluation

- 3.41 In accordance with Bank policy, the Management Unit will gather, store, and retain all information, indicators, and parameters, including annual work plans and the midterm review, needed to help the Bank prepare the final review and project completion report. In addition, two years after program end, the Bank may conduct an ex post evaluation to evaluate the strategy adopted for this program and make any necessary changes to the design of similar programs in the future.

IV. FEASIBILITY AND RISKS

A. Technical feasibility

- 4.1 The works to be financed by the program present no special technical challenges, either in construction or operation, inasmuch as they make use of technologies widely employed for rainwater drainage services, the supply of drinking water, and sewage collection. Technology and materials that are appropriate for the region and have economic and construction-related advantages will be used. The homes to be provided to the resettled population conform to international best practices for low-income housing and constitute cost-efficient solutions that meet the requirements of Bank and Amazonas state government policies.
- 4.2 The projects in the representative sample were prepared in accordance with generally accepted engineering standards and principles and constitute low-cost, technically feasible alternatives that have been tested under similar conditions in the country. The budgets are properly itemized and supported by substantiating data. Advanced basic designs have been prepared for the projects constituting the first group of works, to be executed early in the program. Preliminary designs have been prepared for the remaining works planned under the program, and resources allocated in the program budget to develop designs with the level of detail required for tendering and execution.
- 4.3 The work execution schedule realistically reflects the time required for program activities. In developing this schedule, the special nature of the works, the time required for prequalification and tendering, and experience gained in the execution of similar projects were taken into consideration.
- 4.4 The methodology used to determine project hydrographs was based on the Soil Conservation Service's rainfall-runoff model. Local rainfall records were analyzed to get an accurate picture of Manaus's hydroclimatological conditions. These analyses were used to generate the data to describe local hydroclimatological conditions for use in the rainfall-runoff model: rainfall intensity-duration-frequency curves for the city of Manaus and the seasonal distribution of heavy rainfall.
- 4.5 To measure the degree of surface impermeability of the various watersheds, which varies according to land use and settlement patterns, an in-depth study was done to describe current conditions and forecast future conditions, based on the município's master plan and land use laws.
- 4.6 The rainiest season in the city of Manaus does not coincide with the highest water levels on the Negro River. To accurately depict this variable, a probability study was done combining data on rainfall and water levels on the Negro River, which

provided a complete picture of the combined effect of these variables for the design of the drainage works.

B. Institutional feasibility. ICAS analysis

- 4.7 [The main factors related to the institutional, technical, administrative, and financial capacity of the Department of Infrastructure (SEINF) were analyzed, including those related to operations and the generation of financial and accounting information, using the Institutional Capacity Assessment System (ICAS) methodology. Organizational problems were identified and found to be the result of a heavily bureaucratic structure, compounded by the state's legal restriction on hiring. The existing operational structure was found to be entirely inadequate to the task of managing program execution, as long as the executing agency was tied to SEINF and lacked operational autonomy.]
- 4.8 This analysis was the impetus for a proposal to create a Management Unit for the Social and Environmental Program for the Igarapés in Manaus (PROSAMIM) with a scope limited to the Bank-financed program. This office will be created within the office of the governor of the state of Amazonas, with complete operational autonomy and a small multidisciplinary team of highly skilled experts who will work exclusively on the program and report to an executive manager. Given the legal restrictions on hiring and the state's lack of experience in executing programs of this size, it was determined that a specialized consulting firm should be hired to provide support in the management and supervision of program works.
- 4.9 A new evaluation was done, taking into consideration the proposed execution structure, and the following problems were identified: (a) high risk in the administrative organization system, internal control system, and external control system; (b) moderate risk in the activity planning system and the financial administration system; and (c) low risk in the goods and services management system. These problems are being addressed by: (i) hiring a consultant to develop an organizational handbook and finalize the Operating Regulations for the program; (ii) hiring a consulting firm specialized in project management to help the Management Unit implement the financial-accounting system, document financial management procedures, and administer program finances; (iii) hiring an expert on bidding procedures and an accounting and finance expert for the Management Unit; (iv) tasking the specialized consulting firm to prepare a manual of administrative and financial procedures; and (v) selecting an independent auditing firm as a condition precedent to the first disbursement. **The manual of administrative and financial procedures must have entered into force to the Bank's satisfaction within three months after the loan contract is signed.**
- 4.10 Given the current situation, which is characterized by a lack of experience with the execution of similar programs and a need to get a new office up and running with autonomy and staff hired, trained, and assigned exclusively to work on the program,

according to procedures and routines different from those adopted by the state, the program execution structure will be re-evaluated in response to the creation of the Management Unit, **using the ICAS, 12 months after the loan contract has been signed**, and any changes deemed necessary will be made.

C. Socioeconomic feasibility

- 4.11 A socioeconomic evaluation was done for each of the investments in the sample of projects in the subwatershed that includes the Manaus, Bittencourt, and Mestre Chico igarapés. The evaluation was based on a cost-benefit analysis of scenarios with and without the program. The benefits were calculated on the basis of contingent valuation surveys that were used to produce willingness to pay (WTP) estimates, surveys on shortened travel time and vehicle operating cost savings, appraisals of real property, and the value of savings in property damage, cleanup costs after each flood, and healthcare expenses. The costs considered for the evaluation were incremental investment, operation, and maintenance costs, assessed at efficiency prices. Opportunity costs of land used for public housing and works were also considered, even though some is owned by the state.
- 4.12 The drainage works were subjected to an alternatives analysis that helped determine the least economic cost alternative, including the type of surfacing (concrete vs. gabion), and the optimum recurrence interval. For the subwatershed of the Manaus, Bittencourt, and Mestre Chico igarapés, two alternatives had similar costs (galleries and open culverts vs. open culverts only). The alternative (galleries and open culverts) was chosen on the basis of superior environmental benefits and the preferences of the beneficiary community. The type of surfacing will be concrete and the optimum recurrence interval was determined to be 25 years, taking into account the probability of 10, 25, 50, and 100-year floods.
- 4.13 A cost-benefit analysis was done for each of the projects and at the level of the subwatershed as a whole. The benefits accruing from drainage and road improvements were calculated on the basis of estimates of shortened travel time and cost savings, expected appreciation, and the damage prevented. The benefits of resettlement were estimated on the basis of the differential between the rental value of the housing solutions and the rental prices currently paid. The benefits of sewer services, water services, and public spaces were estimated on the basis of WTP values. Benefits from savings in healthcare expenses were also considered. The analysis showed that the program is economically feasible at the level of each subwatershed and in the case of projects with an economic internal rate of return (EIRR) significantly higher than 12%, except for drainage works, where the calculated rate does not include environmental benefits that are difficult to quantify. All of the benefit-cost ratios came in at over 1.

Economic cost-benefit analysis						
Watershed	Economic net present value (in thousands of US\$)					B/C
	Benefit	Investment	O&M	Net benefit	EIRR	
Drainage	31,825.61	28,250.85	727.94	2,846.82	12.61%	1.10
Water and sanitation	15,812.29	9,507.16	688.78	5,616.35	20.51%	1.55
Resettlement	21,393.92	17,274.75	-	4,119.17	13.45%	1.24
Road improvements	15,946.09	4,926.03	917.77	10,102.28	31.16%	2.73
Manaus-Bittencourt-Mestre Chico subwatershed	84,977.91	59,958.79	2,334.49	22,684.63	15.18%	1.36

- 4.14 A program sensitivity analysis was done, simulating variations in the expected benefits and costs incurred. The simulations were done by varying the values of the estimated parameters. The parameters were shortened travel time, cost savings, and WTP estimates for drainage works, sewer services, and green spaces. The feasibility findings based on this analysis were found to be robust, except for investments in drainage and resettlement projects, where only a 5% increase in costs or a 10% reduction in benefits would be accepted. For the other projects, up to a 25% increase in costs or up to a 30% reduction in expected benefits would be tolerated.

D. Beneficiary analysis

- 4.15 The beneficiary analysis is based primarily on socioeconomic surveys conducted in the program's area of influence between March and May 2004.
- 4.16 **Ability to pay.** The ability of water and sanitation system users to pay was calculated. Ability to pay was not calculated for drainage and road improvement works, because there is no direct fee associated with these services. The monthly bill for water and sanitation services was calculated as less than 5% of household income. The average monthly bill for basic water and sewer services is R\$69.04, assuming residential water consumption of 20 cubic meters, according to Águas do Amazonas. The charge for sewer services constitutes 80% of the average water payment. Based on income distribution data for the program's areas of influence, for 7% of families, the average base amount would exceed 5% of monthly household income, which could translate into payment arrears for water and sewer services. Águas do Amazonas, on its own initiative and in an effort to prevent a drop in collection rates and maintain investment levels, has proposed to the Regulatory Agency for Public Services in the State of Amazonas (ARSAM) that a discounted rate for low-income customers (targeted to household size and income) be added at its next contractual review of rates, scheduled for late 2005, to be covered by a state subsidy. This rate would represent a 75% reduction for families

with income less than R\$260/month, and a 50% savings for families with incomes of up to R\$520/month for the first 20 cubic meters of water consumed. If this proposal is approved, water and sewer rates would not exceed 5% of the monthly income of any beneficiary family for the first 20 cubic meters of water consumed.

- 4.17 **Poverty-targeted investment.** The proposed program qualifies as a poverty-targeted investment. The headcount of low-income beneficiaries is 60%, based on a minimum salary of R\$240 when the surveys were conducted.
- 4.18 **Distributional impact.** Three potential groups of direct beneficiaries were identified to determine the distributional impact of benefits for the low-income population: the public sector (state and município) and the private sector, divided into low-income beneficiaries and other beneficiaries (not in the low-income category). The benefits for the public sector are lower payouts for flood damage and health care. For the private sector, the benefits include shortened travel time and reduced vehicle operating costs, an appreciation of real property, property damage savings, access to basic services, and access to green space.
- 4.19 **Distributional impact coefficient.** The analysis shows that 53.31% of the net economic benefit generated by the program will be captured by low-income beneficiaries. Assuming this estimate is representative, applying this coefficient to the value of the investment (US\$140 million) means that approximately US\$75 million equivalent will benefit low-income groups.

E. Financial feasibility

- 4.20 The borrower and executing agency for the program, which is the state of Amazonas, has the financial capacity to make the local counterpart contribution and service the debt. In addition, the município of Manaus, which will participate in the program by operating and maintaining a major portion of program investments, has the capacity to cover expenses related to those activities.

1. Financial feasibility of the state of Amazonas

- 4.21 An analysis of the financial condition of the state of Amazonas shows that the state's financial parameters meet the requirements of the Fiscal Accountability Act (Law 101/2000) and Federal Senate Resolution 43/2001, as well as the terms of the debt restructuring agreement signed by the state of Amazonas and the finance ministry in 1999.
- 4.22 A primary deficit of R\$193 million in 2001 shifted to primary surpluses in 2002 and 2003 of R\$164 million and R\$171 million, respectively. A budget deficit of R\$231 million in 2001 was eliminated completely the following year, to become a budget surplus of R\$16.5 million in 2003.

- 4.23 Financial projections show that the state has the capacity to meet program commitments, and the local counterpart contribution and debt service commitments in particular. Note that during the program execution period (2005-2010) the local counterpart contribution represents 5.06% of the current account surplus. (Because the program will start in the second half of 2005, only 50% of the surplus was considered for 2005 and 2010). Moreover, financial projections indicate that debt service payments, including the debt from the proposed program, will amount to less than 50% of the current account surplus in each year, starting with a high of 49.9% in 2005 and oscillating between 40% and 45% until 2013, when they will drop substantially for the next two years (21.1% and 13.8%).
- 4.24 These projections confirm that the state will continue to meet the two targets required under the Fiscal Adjustment Agreement. The projected financial debt to net real income ratio, which should be less than 1.0, is 0.63 in 2005 and will drop steadily to 0.27 in 2014. The primary surplus is positive in all years and sufficient to pay the net financial fees and part of the consolidated debt amortizations without falling into arrears/shortfalls.
- 4.25 The sensitivity analysis of the financial projections shows that, even if current revenue growth trails inflation in the first four years, the current account surplus would easily cover the local counterpart contribution. A 90% reduction in the projected current account surplus or a 50% reduction in the projected overall surplus would not affect the availability of resources for the local counterpart contribution. Moreover, given the state's low ratio of debt to income, the option of financing the local counterpart contribution with loans from Brazilian institutions is viable, although it does not appear that it will be necessary.

2. Financial capacity of the município

- 4.26 Although the município of Manaus is not required to request authorization to take on debt, it must comply with laws in force (the Fiscal Accountability Act (Law 101/2000) and Federal Senate Resolution 43/2001), and the corresponding indicators are a good measure of its financial health. The analysis shows that all indicators were met in the 2001-2003 period.
- 4.27 During the 2001-2003 period, the município posted increasing budget surpluses of R\$55.97 million, R\$71.1 million, and R\$82.14 million, respectively. In 2001, the primary surplus was almost three times higher than debt payments, and more than four times higher in the subsequent two years.
- 4.28 An analysis comparing municipal accounts with the anticipated costs of the município's obligations under the program indicates that it has sufficient financial capacity to meet them. These incremental operating and maintenance costs will start at R\$887,000 in the first year and peak at R\$6.4 million (in 2004 reais) in 2013. The latter figure assumes an increase of just 1.02% over total operating costs

in 2003. An analysis of specific line items revealed that the total current expenditures of the municipal departments and decentralized agencies that operate and maintain green spaces, public roads, and solid waste removal was R\$125.6 million in 2003, which represented 19.6% of the município's total current expenditures. The incremental cost projected for 2013 constitutes a 5.11% increase over total expenditures for these items in 2003. Note that the current account surplus in 2003 was 33.2% greater than the total amount of these items, a clear indication that the município has the financial capacity to cover the operating costs associated with the program.

- 4.29 Conservative financial projections for the município indicate that, even in the case of additional operating and maintenance costs, the município would run ever-greater current account and overall surpluses. The sensitivity analysis shows that, adjusting the increase in expenses for inflation, the município would maintain a budget surplus even if revenue only increased at 71% of inflation.

F. Environmental and social impacts

- 4.30 The program has taken social and environmental considerations into account since its conception and transformed the drainage of the igarapés into an additional urban element with multiple actions to improve drainage, the sewer network, and the road system, creating recreational and protected areas. It also incorporates social mobilization and relocation of the population to improve their housing conditions. Thus, the program is aimed at restoring and protecting the environment, especially water resources, which will benefit from reclamation activities along the igarapés of the Educandos-Quarenta watershed in the city of Manaus.
- 4.31 Positive impacts will be associated with improvements in hydraulic flow conditions to prevent flooding, a reduction in domestic and industrial pollution, and the creation of protected and recreational areas. Social benefits will accrue from improvements in the local residents' health and housing conditions and expanded coverage of basic sanitation services. Environmental education and social assistance will contribute to program sustainability.
- 4.32 *Environmental impacts:* The works will have adverse environmental impacts, the majority of which will be localized and temporary and associated mainly with the construction phase. Traffic in the city will be affected, local access for residents will be limited and difficult, and there will be dust and noise. The most serious social impact is related to the need to relocate and resettle a large number of families who live along the igarapés in impoverished conditions.
- 4.33 The social and environmental aspects of this operation were assessed as part of a strategic environmental evaluation of the program. This evaluation, which was conducted parallel to the study of engineering alternatives, covers the entire Educandos-Quarenta igarapé watershed and helped assess the program's overall

- impact. Based on the evaluation, a determination was made that the best alternative would be to restore the igarapé channels by grading and dredging them, and protecting the banks with plant cover. Small masonry structures will be needed at the intersections of roads, paths, and culverts. The executing agency prepared an environmental impact assessment in compliance with Amazonas state regulations and submitted it to the environmental authority—the Environmental Protection Institute of the State of Amazonas (IPAAM)—to obtain an environmental permit for the program.
- 4.34 In the preliminary permit it issued, IPAAM requested an environmental control plan (ECP) for each group of works (each igarapé) as a condition for obtaining the respective construction permit. The ECP is more detailed than an environmental impact assessment (EIA) and includes an impact mitigation and management plan and a monitoring plan, including costs, schedules, and the entities responsible for implementation. The ECP also includes the resettlement plans, which are prepared with community involvement and in accordance with applicable Bank policies. The ECPs for works on the Manaus, Bittencourt, and Mestre Chico igarapés, which constitute the program's representative sample, have been prepared. The structure and scope of these ECPs will be used to prepare ECP for the other igarapés in the watershed, according to guidelines that will be set forth in the program's operating manual. The ECPs will form part of the technical documents included in the bidding conditions for the respective works (see paragraph 3.21).
- 4.35 *Social impacts:* The interventions on the three igarapés in the program's representative sample will necessitate the resettlement of 1,845 local families and 238 businesses and economic activities. In consideration of the number of families that will be directly affected, the resettlement strategy that has been adopted is not limited to population transfer, but will also institute and drive changes in habitability standards, both at the housing level and the level of the urban environment. The proposals in the resettlement plan were based on a socioeconomic assessment and cadastre of the affected community and an intense process of consultation and community participation with the various stakeholders. As a result of this process, a relocation plan has been developed along the following lines: (i) replace makeshift with higher-quality housing, accompanied by activities to better the socioeconomic condition of the families; and (ii) support the re-establishment of affected businesses with a view to formalizing and developing microenterprises in the new settlements. The resettlement plan consists of three subprograms: (i) the housing and family resettlement program; (ii) the economic reactivation program; and (iii) the social inclusion support program.
- 4.36 The housing and family resettlement program provides four relocation options: (a) *construction of new housing*, which gives high priority to relocating families in the immediate area, on reclaimed land along the igarapés, ensuring access to existing services and social infrastructure; (b) *monitored resettlement*, which consists of providing subsidies and support in the form of a mortgage bond to help

families purchase and move into homes available on the local and regional market; (c) admission into public housing programs offered by the Amazonas state government and município of Manaus; and (d) *independent relocation*, which would provide cash compensation in accordance with the country's legal procedures and Bank policies, applicable in the case of residents with full legal rights to their property whose social circumstances are such that they can handle their own relocation. Some interventions will require upgrades to existing lots, updating of title, and renovation in areas of partial intervention. Owners of nonresidential units (commercial, institutional, or service-related) may opt for the independent relocation option or take advantage of new units being built, depending of the owners' circumstances. The economic reactivation program calls for the re-establishment of small businesses run out of the homes of the affected families, and technical support for business startups. The final design and implementation of the resettlement plan will be pursued through a participatory process with the affected families, employing a shared management model that includes ongoing monitoring and evaluation, in order to verify outcomes and impacts at the end of the program. This plan will serve as a model for any resettlements required on the other igarapés included in the program. Two evaluations of the resettlement plan are scheduled: a midterm evaluation after the first 100 families have been resettled, and a final evaluation after all the families have been resettled.

- 4.37 *Consultation and community participation:* The program has been prepared in a thorough, participatory, and interactive manner. Priority has been given to a consultation process with the impacted community with mechanisms for the resident population and stakeholders to participate, from the assessment and alternatives selection phase onward and within the framework of the strategic environmental evaluation and the formulation of the resettlement plan. The following are up and running: (i) a consultative committee, made up of 62 representatives of civil society organizations and state, federal, and municipal entities; (ii) a committee of 12 community representatives elected by the residents of the affected igarapés; and (iii) local support groups in each of the watershed's igarapés, to encourage and enlist the participation of local leaders and representatives.
- 4.38 The strategic environmental evaluation was released to the public on 7 March 2004. The EIA delivered to the state environmental authority was released in Manaus on 22 July 2004 and made available at the Bank's Public Information Center in August 2004. A public hearing to discuss the program EIA was held on 24 November 2004, but did not result in any changes to the document.

G. Benefits

1. Beneficiaries

- 4.39 The beneficiaries of the program will be the people of Manaus in general and the residents of the igarapés in the Educandos-Quarenta watershed in particular, most of whom are in low-income groups. The main benefits of the program will be the elimination or reduction in damage to public and private infrastructure by flooding in the vicinity of the igarapés and an improved quality of life for families who live near the igarapés. These improvements will result from the installation and rehabilitation of storm drainage systems, the installation of sewer services, the resettlement of families who live in high-risk areas, housing improvements, better access roads, and the creation of green spaces. Better sanitation will help reduce the incidence of waterborne disease, with attendant improvements in health, particularly among the poorest families, who currently living in impoverished areas of the city. Temporary job opportunities for unskilled workers will be created in the works construction phase.

2. Expected outcomes and outputs

- 4.40 The main outcome of the program will be elimination of the urban and social problems that squatter settlements along the igarapés in the Educandos-Quarenta watershed pose for the city. Other program outcomes for the same watershed will include: (i) less contaminated water in the igarapés (a 50% reduction in fecal coliform, which is currently 10^{-7} ; a 100% increase in dissolved oxygen (DO), which is currently 0.1 mg/L; a 60% decrease in biochemical oxygen demand (BOD), which is currently 100 mg/L); (ii) a decrease in the population affected by flooding (36,000 people); (iii) utilization of public green spaces in the city (5,000 people/month visit the parks); (iv) a decrease in the incidence of severe diarrhea (from 57.35 to 40.0 cases per 10,000 people); (v) a decrease in the incidence of hepatitis A (from 12.35 to 8.0 cases per 10,000 people); (vi) an increase in the supply of properties valued at US\$8,000 or less (from 186 to 300); (vii) no incursions into reclaimed areas; and (viii) industrial plants remain under the control of IPAAM/SEDEMA.
- 4.41 The expected outputs include: (i) 11.1 kilometers of culverts and interceptor and collector sewers; (ii) 3,500 resettled families; (iii) 13.2 kilometers of streets and avenues; (iv) 3,000 homes connected to water services and 50,000 homes connected to sewer services; (v) 153 industrial plants with environmental improvement plans; (vi) 15 hectares of new green space; (vii) attendance of 300 for health and environmental education courses; (viii) 60 people trained in various areas of municipal administration; (ix) report from the pilot project to renovate buildings for residential and production-oriented use; and (x) a solid waste master plan for the city of Manaus.

H. Risks

- 4.42 **Reoccupation of reclaimed areas.** Reclaimed areas could be taken over again before works are initiated. To prevent reoccupation of these areas, the program calls for effective planning of works and resettlement so as to prevent new squatter takeovers. There are also plans to for the creation of green space and community facilities for the city and the adoption of supervision and control measures by the Amazonas state government and the município, which will implement a comprehensive strategy to deal with squatter settlements, to be studied by IMPLURB (see paragraph 2.4(d)(i)).
- 4.43 **Interagency agreements.** Agreements between the município of Manaus and the Amazonas state government could be adversely affected in the future due to changes of administration at the municipal and/or state level, which could alter government priorities. Because this is very important to the success of the program, the Bank should monitor performance of agreements by the signatory authorities throughout program execution. The midterm review will therefore serve as a mitigating measure.
- 4.44 **Economic viability of the drainage projects.** The EIRR for the drainage projects is greater than 12%, but is vulnerable to cost increases. During program execution, special care should be taken when accepting cost overruns of more than 5% for this component. Special attention will be drawn to this in the transmittal memo to the Bank's Country Office in Brazil.
- 4.45 **Institutional weakness of the executing agency.** During the ICAS analysis, weaknesses were detected in the execution system, along with the associated risks. The proposed execution structure seeks to mitigate this risk, and a new ICAS analysis will be done one year after the loan contract is signed, to identify and address any problems (see paragraph 4.9). The midterm review will therefore serve as a mitigating measure.

SOCIAL AND ENVIRONMENTAL PROGRAM FOR THE IGARAPÉS IN MANAUS (BR-L1005)

LOGICAL FRAMEWORK

Narrative summary	Indicators	Means of verification	Assumptions
Goal	Three years after program end:		
To improve the quality of life of the residents of the Educandos-Quarenta watershed in the city of Manaus.	<ul style="list-style-type: none"> ▪ 5% increase in the human development index (HDI) for the Educandos-Quarenta watershed. HDI = 0.675 en 2004 (estimate) ▪ 2% increase in the HDI for the city of Manaus. HDI = 0.787 en 2004 	IBGE ¹	
Purpose	By program end:		
To address the environmental and social problems affecting the residents of the Educandos-Quarenta watershed in the city of Manaus.	<ul style="list-style-type: none"> ▪ % reduction in the water contamination in the igarapés: a 50% reduction in fecal coliform (currently 10^{-7} per 100 mL); a 100% increase in dissolved oxygen (DO) (currently 0.1mg/L) and a 60% decrease in biochemical oxygen demand (BOD) (currently 100 mg/L). ▪ 36,000-person decrease in the population affected by floods. At present, 36,000 people are affected. ▪ 5,000 people/month visit new parks 	<p>Program monitoring and evaluation system – Special Management Office and IPAAM</p> <p>Resettlement plan evaluation system – Special Management Office</p> <p>Program monitoring and evaluation system – Special Management Office</p>	<p>The government maintains its credibility with the community.</p> <p>The city maintains control over land use and settlement.</p>

¹ IBGE - Instituto Brasileiro de Geografia e Estatística [Brazilian Institute of Geography and Statistics]

Narrative summary	Indicators	Means of verification	Assumptions								
	<ul style="list-style-type: none">Decrease in the incidence of severe diarrhea from 57.35 to 40.0 cases²Decrease in the incidence of hepatitis A from 12.35 to 8.0 casesIncrease in the supply of properties valued at US\$8,000 or lessThere are no incursions into reclaimed areas.Industrial plants remain under the control of IPAAM.	Official Epidemiological Information System of the Health Ministry – Manaus Municipal Health Secretariat Idem Program monitoring and evaluation system – Special Management Office Município of Manaus State government – IPAAM ³ Município of Manaus – SEDEMA ⁴									
Components 1. Environmental and housing Improvements a. Macro and micro drainage	<ul style="list-style-type: none">Meters of culverts built:<table><tr><td>▪ Sample⁵</td><td>▪ Program</td></tr><tr><td>▪ 1,620</td><td>▪ 2,500</td></tr></table>Meters of culverts rehabilitated:<table><tr><td>▪ Sample</td><td>▪ Program</td></tr><tr><td>▪ 0</td><td>▪ 2,000</td></tr></table>	▪ Sample ⁵	▪ Program	▪ 1,620	▪ 2,500	▪ Sample	▪ Program	▪ 0	▪ 2,000	Program monitoring and evaluation system – Special Management Office Idem	Participation and institutional coordination of key stakeholders.
▪ Sample ⁵	▪ Program										
▪ 1,620	▪ 2,500										
▪ Sample	▪ Program										
▪ 0	▪ 2,000										

² Incidence per 10,000 inhabitants.

³ IPAAM – Instituto de Proteção Ambiental do Estado do Amazonas [Environmental Protection Institute of the State of Amazonas]

⁴ SEDEMA – Secretaria Municipal de Desenvolvimento e Meio Ambiente [Municipal Department of Environmental Protection]

⁵ The sample figures will be required for the midterm review.

Narrative summary	Indicators	Means of verification	Assumptions																				
b. Urban renewal and resettlement	<div><div>Meters of stormwater galleries built:</div><table><tr><td>Sample</td><td>Program</td></tr><tr><td>3,744</td><td>5,500X</td></tr></table></div> <div><div>Meters of culverts built:</div><table><tr><td>Sample</td><td>Program</td></tr><tr><td>300</td><td>700</td></tr></table></div> <div><div>Hectares of green space created:</div><table><tr><td>Sample</td><td>Program</td></tr><tr><td>10</td><td>15</td></tr></table></div> <div><div>Families resettled:</div><table><tr><td>Sample</td><td>Program</td></tr><tr><td>1,845</td><td>3,500</td></tr></table></div> <div><div>Houses titled and registered:</div><table><tr><td>Sample</td><td>Program</td></tr><tr><td>1,500</td><td>2,000</td></tr></table></div>	Sample	Program	3,744	5,500X	Sample	Program	300	700	Sample	Program	10	15	Sample	Program	1,845	3,500	Sample	Program	1,500	2,000	Município of Manaus – IMPLURB ⁶	<div>Legal and regulatory framework.</div> <div>Implementation of the master plan for the city.</div> <div>Policy to maintain basic social services (transportation, education, infrastructure).</div>
Sample	Program																						
3,744	5,500X																						
Sample	Program																						
300	700																						
Sample	Program																						
10	15																						
Sample	Program																						
1,845	3,500																						
Sample	Program																						
1,500	2,000																						

⁶ IMPLURB - Instituto Municipal de Planejamento Urbano [Municipal Institute of Urban Planning]

Narrative summary	Indicators	Means of verification	Assumptions								
c. Streets and avenues	<div>Meters of streets built:</div> <table><tr><td>Sample</td><td>Program</td></tr><tr><td>7,700</td><td>11,500</td></tr></table> <div>Meters of avenues built:</div> <table><tr><td>Sample</td><td>Program</td></tr><tr><td>0</td><td>1,200</td></tr></table>	Sample	Program	7,700	11,500	Sample	Program	0	1,200	Município of Manaus – IMPLURB Município of Manaus – SEMOSB Município of Manaus – EMTU ⁷	Legal and regulatory framework. Implementation of the master plan for the city.
Sample	Program										
7,700	11,500										
Sample	Program										
0	1,200										
d. Pilot project to renovate buildings for residential and commercial use	<div>Final report completed</div>	Program monitoring and evaluation system – Special Management Office									
2. Sanitation infrastructure											
a. Water and sewer services	<div>Homes connected to water system:</div> <table><tr><td>Sample</td><td>Program</td></tr><tr><td>1,845</td><td>3,000</td></tr></table> <div>Homes connected to sewer system:</div> <table><tr><td>Sample</td><td>Program</td></tr><tr><td>31,175</td><td>50,000</td></tr></table>	Sample	Program	1,845	3,000	Sample	Program	31,175	50,000	State government – IPAAM Município of Manaus – SEDEMA Águas do Amazonas – ARSAM ⁸ Município of Manaus – ARSAM	Participation and institutional coordination of key stakeholders through agreements with the state government and the município of Manaus.
Sample	Program										
1,845	3,000										
Sample	Program										
31,175	50,000										

⁷ EMTU - Empresa Municipal de Transportes Urbanos [Municipal Urban Transportation Company]

⁸ ARSAM - Agência Reguladora de Serviços do Amazonas [Regulatory Agency for Public Services in the State of Amazonas]

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION

Brazil. Loan /OC-BR to the State of Amazonas of the Federative Republic of Brazil
Social and Environmental Program for the Igarapés in Manaus

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 State of Amazonas, as Borrower, and the Federative Republic of Brazil, as Guarantor, for the purpose of granting the former a financing aimed at cooperating in the execution of a social and environmental program for the igarapés in Manaus. Such financing will be in the amount of up to US\$140,000,000, from the resources of the Single Currency Facility of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Executive Summary of the Loan Proposal.