

SUSTAINABLE DEVELOPMENT PROGRAM FOR THE PANTANAL

(BR-0249)

EXECUTIVE SUMMARY

Borrower and Guarantor:	The Federative Republic Of Brazil			
Executing agency:	Ministry of the Environment			
Amount and source:			First Phase	Second Phase
	IDB: (OC)	US\$	82.5 million	117.5 million
	Local:	US\$	82.5 million	117.5 million
	Total:	US\$	165.0 million	235.0 million
Financial terms and conditions:	Amortization Period:		20	Years
	Grace Period:		4	Years
	Disbursement Period:		4	Years
	Interest Rate:		variable	
	Supervision and Inspection:		1.00	%
	Credit Fee:		0.75	%
	Currency:		Euro	
Objectives:	The Goal of this Program is to foster sustainable development in the Upper Paraguay Basin with special emphasis on the Pantanal. The Purpose of this Program is to stabilize the environmental quality of the Pantanal's ecosystems by supporting reforms in the management and conservation of natural resources.			
Multi-phase Program Loan	The Program is designed as a Multi-Phase operation consistent with the five criteria set out in the Policy Document establishing Multi-Phase Program Loans, GN-2085:			
	(i)	It requires a sustained effort to make a difference in addressing pervasive environmental problems.		
	(ii)	It focuses on the sectoral framework for longer-term intervention.		
	(iii)	It is an effort to build ownership and sustainability through institutional change and regulatory frameworks.		
	(iv)	It provides the opportunity to adapt and update mid-		

stream within the overall agreed framework.

- (v) It puts emphasis on on developing sustainable institutions rather than ad hoc Project Implementation Units.

By 2010, a year after the end of the second phase, the Program should have achieved the following measurable results. First, the water of the Cuiaba and Miranda Rivers that enters the Pantanal should attain Class II quality standards with special emphasis on the standards for dissolved oxygen and sediments, and there should be substantial improvement in the quality of the Taquari River. Second, the populations of the 10 principal species of commercial fish should be stable or increasing. Third, the amount of the watershed under designated protection should have increased to 2,000,000 ha (5% of the land area in the Upper Paraguay Basin) from 546,206 ha (1%) in 1999. Finally, sustainable activities should have increased, specifically aquaculture production in the Upper Paraguay Basin should have increased from 8,850 to 13,275 metric tons and the number of tourist visitors should have increased by 50% over the number registered as part of the Program's baseline indicators in 2001.

Description:

The Program has seven sub-programs

1. **Administration of water resources** This sub-program monitors and regulates the use of water in the Cuiaba, Miranda and Taquari watersheds. It implements five projects to (i) monitor surface and ground water quality, (ii) implement an information system to manage surface and ground water, (iii) assign, regulate and charge for the right to use ground and surface water, (iv) implement a water management system that is decentralized to the watershed level, and (v) monitor hydrological flows and issue flood warnings.
2. **Soil and pesticide management in critical sub-watersheds** This sub-program reduces the amount of silt and agrotoxics that enter critical sub-watersheds. The first phase addresses sub-watersheds in the Velmelho, San Lorenzo, Miranda and Taquari watersheds, all of which have critical erosion problems. The sub-program will finance the preparation and implementation of integrated micro-watershed management plans and pilot projects.
3. **Protection and management of habitat, fish and wildlife** This sub-program preserves representative ecosystems and protects the Pantanal against destruction of natural vegetation, poaching and over-fishing. This sub-program comprises projects to (i) consolidate national parks and implement newly declared state parks; (ii) establish a biosphere reserve; (iii) implement protected fish reserves in spawning areas, (iv) equip and train public officers, volunteers, forest police and firefighters who enforce fishing regulations and control poaching and illegal fires, (v) studies for new parks that will be implemented in the second phase; and (vi) studies to determine

mechanisms to pay for environmental services and to acquire control of land within parks without having to purchase it.

4. **Sanitation** This sub-program improves the quality of rivers that are tributaries of the Pantanal. The sewerage works financed by the Program include collection networks, interceptors, pumping stations and treatment plants. The program also finances works to reduce water losses and improve efficiency. The subprogram also finances preparation of a strategic plan for the integrated management of solid waste in the Upper Paraguay Basin and feasibility studies for the implementation of the plan in the second phase.
5. **Support for sustainable economic activities.** This sub-program stimulates economic activities that do not adversely affect the environmental quality of the Pantanal. This program has three components: fish production and fisheries management, ecotourism, and sustainable agriculture.

Fish production and management has three activities: (i) research on the biology, genetics and pathologies of the ten main species of commercial fish; (ii) creation of a fish gene bank to be used for aquaculture and reintroduction of species in depleted areas; (iii) implementation of a statistical system for fisheries to improve the monitoring and administration of fisheries.

Tourism/ecotourism sub-program finances a master plan to develop ecotourism in the Upper Paraguay Basin. It includes: (i) a diagnosis of the facilities and services currently provided and a diagnosis of the institutions that support these services, (ii) a study of the Brazilian ecotourism market, (iii) an assessment of needs for training, (iv) a study of, and guide for, best practices in the provision of services, (v) an analysis of existing regulations for tourism services, recommendations for improvement and a reference guide on sources of finance for investors, (vi) a tourism information system, and (vii) plans for development of areas with tourism/ecotourism potential in the Basin.

Sustainable agriculture component finances: (i) a study of the potential for trade-marking and environmental certification of Pantanal products; (ii) compilation of existing technical information on improved pasture, herd management, marketing and sources of finance for business plans; and (iii) dissemination of the results of the studies; (iv) demonstration projects for the production of two species of wildlife; (v) a pilot project in feral pig management (private hunting and trapping); (vi) manuals on techniques to produce environmentally compatible alternative products and assistance to develop marketing chains and obtain credit.

6. **Parkways and roads.** This sub-program guarantees all-year access to parks and attractions for ecotourism, provides evacuation routes for cattle during flood season, and facilitates protection of habitat by

giving better access to firefighters and environmental enforcement agents. It finances the reconstruction of 106 kms of parkways and other roads.

- 7. Environmentally sustainable activities in indigenous areas** This sub-program implements sustainable land use activities on indigenous lands. In MS, the program finances: (i) community organization to plan, execute and maintain projects, (ii) restoration of gallery forests and native vegetation along streams and rivers, (iii) planting of seeds and seedlings on native lands, and (iv) technical assistance for the reintroduction of traditional agricultural products and natural fertilizers to restore land productivity, and (v) the construction of fences and introduction of small scale capivara production for own consumption. In MT, it finances (i) community organization, (ii) training in economically sustainable practices, and (iii) identification of, and training in, culturally appropriate activities. Both state programs have an evaluation study that will recommend actions for the second phase.

**Trigger
indicators for
second phase**

Seven achievements in the first phase are necessary to make progress toward the objectives of (i) Class II water quality, (ii) increasing fish population, (iii) increased protected area and (iv) increased sustainable activities. These achievements are the target indicators for considering the second phase of the program. They are:

- (i) A register of all users who extract water from ground and surface sources and who discharge waste in water bodies.
- (ii) The States of MS and MT send out the first bills for the right to use water in the Cuiaba, Miranda, and Taquari basins and establish the price structure for volumes extracted or discharged.
- (iii) New fish legislation (or regulations), based on Program research, has been approved and is being enforced.
- (iv) 20% of the land in the state parks of the Program is owned by the states and that an additional 20% of the land in federal protected areas of the Program is owned by the federal government.
- (v) Campgrounds, fishing lodges, and fazendas with guest lodgings in the Pantanal are licensed and inspected at random at least once a year, and tourist guides in the Pantanal are trained and licensed.
- (vi) All studies for projects for the second stage are presented to the civil society members of "State Committees" and have objections noted in writing for the consideration by the governmental authorities and the future project team.
- (vii) Cost recovery mechanisms generate cash flow to support

maintenance of rural roads, operating costs for firefighters, and operation of federal and state protected areas.

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

The strategy of the Bank in Brazil emphasizes: (i) reform and modernization of the public sector at the federal and state levels; (ii) improved competitiveness by supporting the financial system, small and medium sized enterprises, rehabilitation of basic infrastructure, tourism development, and regional integration; (iii) reduction of social inequality and poverty, giving priority to education and health and seeking out associations with the community and civil society; and (iv) attending problems of management of the environment and natural resources.

The proposed program is consistent with the Bank's strategy. It supports reform and modernization of the public sector at the federal level (MMA, IBAMA) and the state level (i) by improving and enforcing environmental laws and regulations, and (ii) by promoting more effective use of public resources in the protection and provision of public goods. The program includes rehabilitation of basic infrastructure to support sustainable economic development, especially ecotourism. The program invests directly to protect critical natural habitats, recover degraded areas, and improve environmental management.

**Environmental/
social review:**

The CESI, in its review of the Profile II of the program, found that the Program was not likely to have major negative environmental impacts and did not require an Environmental Impact Assessment (EIA). It did ask for a general environmental and social analysis of the Program, to be submitted to the CESI in the form of an ESIR. An EIA/RIMA was performed for the proposed Transpantaneira parkway MT-060, because of its potential negative environmental impacts. The EIA was made available to the public on March 20, 2000. A public hearing was announced on June 14, 2000, and held on August 9, 2000. The draft ESIR in Portuguese covering the entire program was made available to the MMA for distribution on August 14, 2000. The CESI reviewed and approved the ESIR on September 29, 2000.

Direct adverse environmental impacts from the Program will be temporary and minimal. The impacts are easily mitigated using known construction control techniques and by proper siting of borrow pits and loading facilities.

Long-term adverse environmental impacts are possible because of increased ecotourism in the area. However, these impacts are even more likely without the Program. The Program will help develop ecotourism at an appropriate scale with appropriate safeguards (municipal norms and procedures and training). Management planning for protected areas and parkways will determine environmental carrying capacities and establish limits on visitors and activities. Implementation of management plans for parkways will ensure that zoning and land use restrictions control

possible adverse impacts from development along improved roads.

The Program is designed to have positive gender impacts. Gender considerations have been included in three sub-programs. In the soil and pesticide management there will be meetings to brief women on actions to be taken to get their participation and support. In urban sanitation, there will be briefings on hygiene and water conservation for women in households that get new connections. In the indigenous areas sub-program, women will receive training, consistent with indigenous values, in handicraft production, marketing, and managing small-scale tourism activities. Anthropological and technical support will be available.

Benefits:

The Program will produce benefits over the long term. Expected social benefits include improved quality of life from the provision of basic water and sanitation services. Health risks will be reduced directly by decreasing the level of agrotoxic chemicals in the water. Early warning will reduce the risk of loss or damage from floods. An indirect social benefit over the long term will be the presence of a watershed authority that ensures rational use of water resources, protection of groundwater and resolution of conflicts. Economic benefits include increased income for producers in the upper basin and in the Pantanal floodplain, reduced road user costs and increased tourism benefits. Indirect benefits will occur, especially over the long term, including increased income and employment generated from a more diversified economic base.

It is possible to identify direct beneficiaries for the soil and pesticide management and the urban sanitation sub-programs. The soil and pesticide management sub-program will directly benefit 11,800 producers in MS and 7,800 in MT. Forty eight percent of the beneficiary households in MT are low income (less than 3 minimum salaries). No data were available to calculate the percentage of beneficiary households in MS that are low income. In addition, the sanitation sub-program will benefit 304,805 people in the 10 municipalities where water and sewage investments will be made. The majority (72% to 89%) of beneficiaries of the proposed water and sewage projects are low income. The indigenous action plan will benefit 22,900 indigenous people in the two states. There are a number of direct beneficiaries from investments in parkways, was not estimated.

Risks:

There are a number of risks associated with this Program. The executor and the sub-executors have little experience with this type of Program. The state institutions are weak and there have been significant delays in the execution of World Bank projects. The Program addresses these risks by financing the hiring of a firm specialized in financial administration to assist the executors and participating institutions. In addition, the Program includes training for the staff of the executing units.

The states are in weak financial condition. They have improved their budget indicators by selling assets and making significant cuts in their

operating and capital budgets. These cuts cannot continue and, in fact, the Program implies increased operating and maintenance costs. The Program addresses this risk by emphasizing the consolidation of existing activities (parks, forest police, firemen) in the first stage in order not to increase personnel costs significantly. It leaves expansions for the second phase. In addition, the Program emphasizes financial mechanisms that have beneficiaries contribute to the cost of operation and maintenance (water use charges, tolls for road use, use fees for parks, beneficiary contributions for rural road maintenance and operating cost of fire departments). The Program provides an incentive for the States to budget funds for adequate maintenance by making continuation to the second phase dependent on success in the first phase.

A third risk is possibility that in a complex program, the executors can lose focus on priorities. The Program addresses this risk contractually by requiring that environmental activities be started before infrastructure works can be put out to bid. In addition, the first year review will keep the Program on target.

A fourth risk is that the mechanisms set up to foster public participation may not work effectively. There already have been disputes among groups that want to be represented on committees. Members may not have the sustained interest to work out and agree on the operating rules. The Governments may ignore recommendations. To manage these risks, the Bank hired consultants to help civil society organize public meetings that established a preliminary structure for participation. The Program design includes information systems available to the public and provides US\$600,000 to support civil society participants. The Bank will follow the participation process closely. It has already offered the help of facilitators to assist the organization process. It will send a mission to evaluate progress in the establishing of the Operating regulations three months after the approval of the operation. It will monitor the information provided to civil society to make sure it is complete. Each program review will explicitly evaluate the problems and successes with the participation process.

**Special
contractual
clauses:**

Prior to first disbursement, the Borrower must:

- Establish the Program's Executing Unit and staff it with appropriate personnel(¶3.11) and establish Sub-Executing Units in IBAMA and the States of MS and MT and staff them with appropriate personnel.¶3.16
- Submit the bidding documents and procedures for contracting the management firm for the approval by the Bank. (¶3.17)
- Submit execution agreements (prepared in accordance with a draft previously approved by the Bank) with the executing and participating entities.¶3.1

- Submit evidence that civil society participation Committees have been constituted and assigned attributions and responsibilities.¶3.61
- Put in effect the Operating Regulations for the soil and pesticide management program.¶3.27

Other special clauses

- Prior to initiating the contracting of any goods, services, works or studies, the Borrower must have contracted a management firm. ¶3.17
- Within 3 months of first disbursement, the borrower should provide evidence that the State Committees have had their first meeting. ¶3.61
- Within eight months of the signature of the Contract, FEMA-MT and FEMA-P must assign the necessary people to supervise the Water Resource Administration sub-program. ¶3.25
- Prior to the publication of the bidding documents for the acquisition of equipment for the Forest Police in MT and MS respectively, the Borrower must submit evidence that MT and MS have assigned an adequate number of additional officers in the area where the equipment will be used.¶3.33
- Prior to the publication of bidding documents for the construction of a fire station in a municipality, the Borrower must provide evidence that the municipality has signed an agreement with the Firefighter Corps to pay for energy, water and utility costs, the operation and maintenance of equipment, and part of the replacement cost of light equipment directly used to combat fire. Prior to the publication of bidding documents to equip a new station the borrower must provide evidence that the State of MS has assigned 60 firefighters for each of the two new fire stations. ¶3.34
- Prior to the disbursement of funds to execute the sanitation sub-program in the state of MT, the borrower must submit (i) an agreement with the Municipality of Cuiaba on the responsibilities of both parties in the institutional strengthening of the agency, (ii) evidence that the water company of Cuiaba's Municipality has been formed, and (iii) a copy contract with a private firm to help administer the company. ¶3.38
- Prior to publication of bidding documents in sanitation in MS, submit evidence of (i) an agreement with SANESUL; and (ii) plan to improve the operating efficiency of SANESUL.¶3.36
- Prior to the publication of bidding documents (i) for infrastructure projects requiring environmental licenses, submit evidence that the environmental review and license process has been completed; (ii)

for the first road in the states of MT and MS, submit an agreement with DVOP and DERSUL on the responsibility of the parties in the execution of parkway and roads; and (iii) for parkways and the Bonito-Bodequena road, submit the corresponding environmental management plan to be included in the bidding documents.¶3.70 and ¶3.46

- Prior to awarding contracts to finance any infrastructure work, contract a firm to do the supervision of construction and compliance with environmental requirements. ¶3.70

Poverty-targeting and social sector classification:

This operation does not qualify as social equity enhancing project, as described in the indicative targets mandated by the Bank's Eighth Replenishment (Document AB-1704). Furthermore, this operation does not qualify as Poverty Targeted Investment (PTI).

Exceptions to Bank policy:

No exceptions to Bank Policy are recommended.

Procurement:

Procurement of civil works, goods and services, and hiring of consulting services will be subject to the Bidding Procedures specified in Annex B and Annex C of the Loan Contract. When the estimated value of civil works is the equivalent of five million dollars (US\$ 5,000,000) or greater, and when the estimated value of goods and services is the equivalent of three hundred fifty thousand dollars (US\$350,000) or greater, the civil works or goods and services will be subject to international competitive bidding as specified in Annex B. All consulting contracts with amounts equivalent to two hundred thousand dollars (US\$200,000) will be subject to international competitive bidding. The procurement plan is attached in Annex III-1.

I. FRAME OF REFERENCE

A. Description of the Pantanal and the Upper Paraguay Basin

- 1.1 Near the geographic center of South America lies the Pantanal, the largest complex of wetlands in the world (see map 2). The Pantanal is part of the Upper Paraguay Basin, which includes the upper watershed that drains into the Paraguay River. The Table below shows that the entire basin covers 361,666 square kilometers in the States of Mato Grosso (MT) and Mato Grosso do Sul (MS) of Brazil. The Pantanal is made up of ten large rivers, their deltas, and thousands of lakes and salt pans. It contains a number of different ecosystems, more than 650 species of birds, 400 species of fish, and an extraordinary diversity of vegetation and wildlife. The area is the refuge for many of Brazil's threatened species.

AREA OF THE PANTANAL AND THE UPPER PARAGUAY BASIN
(km²)

	Pantanal	Upper Watershed	Total
Total	138,183	223,483	361,666
MT	48,364	145,264	193,628
MS	89,819	78,219	168,038

- 1.2 The Upper Paraguay Basin has 1.8 million people (1.35 million in MT and 450,000 in MS). This population includes 22,000 indigenous people in MS and 1,900 in MT. The principal economic activities in the Pantanal are low density cattle ranching, fishing and tourism, while the rest of the Basin has intensive ranching, agriculture (soy, corn and sugar cane), forestry, charcoal production, mining and other activities.

B. The environmental quality of the Pantanal is deteriorating

- 1.3 The quality of water in the Pantanal is decreasing and fish and wildlife populations are declining. The area is experiencing more frequent and severe flooding. These changes are threatening the traditional way of life of the Pantanal rancher and the indigenous population. Continued deterioration will cause (i) increased damage from floods not only in Brazil but also in Bolivia, Argentina, and Uruguay, (ii) increased cost of river transportation as dredges have to remove ever increasing amounts of silt from waterways, (iii) elimination of the fishing industry, (iii) disruption of the food chain of song birds and large migratory bird populations, and (iv) the extinction of other species.

1. Declining water quality

- 1.4 Most rivers entering the Pantanal carry high loads of sediment. Seven out of ten rivers have a mean annual concentration of sediment above 200 Mg/Lt. The Aquidauana, São Lourenço and Taquari rivers carry 410, 486 and 491 Mg/Lt.,

respectively. Sediment settles on river bottoms blocking channels, changing the course of rivers, and subjecting large areas to floods. The floods wash out river-bank vegetation, destroying habitat. The process that causes siltation has increased the area subject to flooding, and the volume and speed of flood waters.

- 1.5 Concentrations of chemical residues, well above national and international standards, enter the upper watershed streams, percolate into the ground water, and flow to the Pantanal where they enter the food chain with lethal effect. Water and sediments in most rivers contain significant concentrations of chlorpyrifos (an organophosphate insecticide), cyclodienes (used in organochloride insecticides) and triazines (a class of herbicides). Toxics, chemicals and heavy metals (mercury) from industrial and mining discharges reach the rivers and accumulate in the water and the fish of the Pantanal.
- 1.6 While the water quality indices for many stretches of river in the Upper Paraguay Basin are acceptable or good, others have significant problems. Fecal coliforms counts as high as 50,000/100 ml (well above standards for class II water bodies) have been found in some stretches of the rivers. In the rainy season, run-off carries decaying organic material and fecal material from cattle that have a severe impact on dissolved oxygen and the capacity of water to support aquatic life. The indices for turbidity, phosphates and solid wastes are also well above standards in the rainy season. The State of MT estimates that an organic load of 41 metric tons per day measured in Biochemical Oxygen Demand (BOD) enters the Cuiaba River in MT along with 9,378 kg of nitrates, and 2,300 kg of phosphates. The State of MS estimates that its rivers receive BOD loads of 5 metric tons from human sources.

2. Declining fish populations

- 1.7 Fishing in the rivers of the Pantanal is an important economic activity. Populations of the ten principal species of fish are declining. While an adequate statistical series does not exist, the evidence is clear. The registered catch has remained relatively constant at 5,000 metric tons over the past few years, while the number of fishermen has increased dramatically, and the average size of fish caught has decreased. This indicates pressure on the fish population. The price of fish to the final consumer has risen from R\$ 3/kg in 1996 to R\$ 5/kg in 2000 for "pintado" and from R\$ 2.50 to R\$ 4.50 in the same period for "pacu", indicating increasing scarcity.

3. Threatened habitat

- 1.8 About 98% of the land in the Upper Paraguay Basin is privately owned. There are few protected areas, and the ones that exist are not well managed. There are four federal protected areas, all located in MT. These include two national parks: Chapada dos Guimaraes (33,000 Ha, located in the upper watershed) and Pantanal National Park (135,000 Ha); and two Ecological Stations: Serra das Araras (28,700 Ha, in the upper watershed) and Taiama (14,325 Ha). There are four new

state parks: Lagoa Azul-MT, Taquari State Park-MS, Rio Negro-MS, and the Coxim Scenic River-MS. Including private natural reserves, the percentage of the watershed that is protected is about 1%. This is one tenth of the area internationally recommended for protection. Few of the different geomorphological and ecological wetlands are represented in protected areas in lowlands and the ecological representativeness of existing protected areas in the upper watershed is even less.

- 1.9 The State of MT has the highest incidence of fires in Brazil, and the State of MS is the third worst. Fire threatens habitat and kills wildlife.

4. Threatened cultures (way of life)

- 1.10 The land of the indigenous population is limited and degraded. Indigenous families live below the poverty line and lack adequate food supplies. Lacking productive possibilities on their own land, indigenous people often work outside as farm laborers harvesting sugar cane. The majority of Indian groups in the basin are in a process of cultural erosion with a risk of losing their collective social organization and their traditional practices of production.
- 1.11 The way of life of the Pantanal rancher is also under threat because of decreased profitability caused in part by environmental problems, many are beginning to sub-divide or sell their land abandoning their traditions.

C. Causes of the problem

- 1.12 Most of the problems of the Pantanal and Upper Paraguay Basin are caused by the economic or recreational activities of people who are unaware or indifferent to the consequences of their actions. Up to now, the states have not provided sufficient information to discourage these practices nor have they made a concerted effort to control the use and to manage the natural resources. The following sections discuss the principal problems in agriculture, mining, ranching, fishing, tourism and urban areas.

1. Agricultural practices in the Upper Basin

- 1.13 Agricultural practices in the Upper Paraguay Basin cause many of the problems of the Pantanal. Farmers remove the forest and use fire to clear land. These practices have reduced the vegetation cover and the water retention capacity of soils.
- 1.14 Because of topographic, physical or chemical characteristics, the soils of the Basin are highly susceptible to erosion. This susceptibility is aggravated by poor cultivation techniques. Farmers do not terrace or use contour plowing on slopes. They till pastures for planting. Despite laws to the contrary, they clear their land all the way to the watercourses making it easy for silt to run into them. Ranchers overgraze their pastures and let cattle drink at streamside. Cattle create trails that are channels for erosion. Many farmers are not aware that their agricultural

practices will deplete soils and lower their production and income. They do not know or do not care that the silt that they generate causes problems for others downstream.

- 1.15 Municipalities, farmers and ranchers build roads that have too steep a grade, have no crown or an inverted crown, and have no drainage. These roads cause erosion and are conduits for sediments from other areas.
- 1.16 Soy, corn, and sugar cane farmers over apply fertilizers and pesticides with no regard for regulatory restrictions. These toxics have downstream effects, contaminating ground water wells, increasing water supply treatment costs, and entering the food chain killing fish and birds. The over-application of fertilizers and pesticides increases costs without any incremental effect on production.

2. Mining practices in the Upper Basin

- 1.17 Individual mining (gold, diamonds) continues in some upland areas. Much of this activity is unlicensed and illegal. Miners strip the vegetation of large areas which leads to severe erosion and siltation of waterways. Miners are indifferent to the consequences. They simply move on. MT has degraded, abandoned mining areas that are major sources of sediment and heavy metal pollution.

3. Ranching in the Pantanal

- 1.18 With the increased rapidity and volume of floods, ranchers have had problems with cattle drowning. They have reacted by cutting the trees on hillocks to provide pasture above the flood plain. This has caused additional erosion and siltation, reduced habitat, and caused local increases in cattle density affecting water quality. Since 1970, ranchers have built one thousand kilometers of rural roads and hundreds of kilometers of dikes and dams to protect their lands or move cattle quickly. These roads and dikes block the migratory routes of fish and cause anoxic conditions that kill fish. The dikes merely re-route water increasing flooding for other ranchers or for downstream populations in Corumba, Aquidauana, and Porto Mortinho.
- 1.19 Farmers and ranchers use fire to renew grasses for cattle in natural savannas, to clear crop fields for the next planting season, or to clear land. These fires reduce the fertility of soils and often get out of control killing wildlife, changing the composition of vegetation and, when near watercourses, causing acid and organics to enter watercourses depleting the oxygen in the water and causing large fish kills. Most farmers are not aware that fires damage soil productivity and do not know techniques to decrease the dangers of "controlled burns". There are also frequent accidental fires and fires caused by lightening.
- 1.20 Ranching is threatened by the declining real price of cattle caused by competition outside the Pantanal and by high transport cost due to poor roads that are impassable some parts of the year. In addition, the yield of cattle is declining

because of increased drownings, competition for food by feral water buffalo and feral pigs, and predation by jaguar and puma. This puts further pressure on the rancher.

- 1.21 Because of decreasing profitability, ranchers are beginning to sub-divide their properties or to sell them. The new producers who are moving in have been introducing intensive agricultural crops such as rice. These crops introduce fertilizers and pesticides directly into the Pantanal where they endanger the food chain for fish and birds.

4. Fishing and poaching

- 1.22 In addition to decreases in fish population caused by blocked migration routes, contamination of water by agrotoxics, and anoxic conditions, some species of the Pantanal are over-fished.
- 1.23 Large-scale commercial fishing enterprises located in the Corumba region operate under Bolivian and Paraguayan flags. These companies are not governed by stricter Brazilian regulations and have a heavy impact on fish populations. Subsistence and small-scale commercial fishing are traditional activities of socio-economic importance. About 3,400 small commercial fishermen are registered in MT and 4,600 in MS. These fishermen extract about 2,200 metric tons per year. The number of fishermen has been decreasing over time and some have taken jobs as guides on recreational fishing boats.
- 1.24 Recreational fishing has increased dramatically, particularly in MS, where it has grown from 20-32% of reported catch weight in 1979-81 to over 86% in 1998. As practiced, recreational fishing is not sustainable. This spatial and temporal concentration reduces adult fish populations in popular locations. Although fishing limits have recently been reduced, they still may be overly generous: 20 kg. per person in MT and 15 kg. plus one individual fish per person in MS. But even lower limits will be irrelevant if the number of amateur fishermen keeps increasing, and catch pressure continues on some species.
- 1.25 There is significant poaching and illegal fishing (fishing that uses nets, exceeds catch limits, or is out of season). The table below shows the number of kg of fish confiscated by the police and the number of illegal fishing practices that were found. The table shows data on poaching as well.

FISH AND ILLEGAL EQUIPMENT CONFISCATED IN THE PANTANAL AREA 1997-1999				
Year	Kg. of Fish Confiscated		Number of Occurrences of Illegal Equipment	
	MT	MS	MT	MS
1997	15,146	13,589	1,319	n.a.
1998	12,785	9,546	2,937	n.a.
1999	10,730	15,979	5,897	n.a.

BIRDS AND WILDLIFE CONFISCATED IN THE PANTANAL AREA 1997-1999				
Year	Number of Birds Confiscated		Number of Animals and Reptiles Confiscated	
	MT	MS	MT	MS
1997	n.a.	1,100	553	149
1998	n.a.	1,900	432	100
1999	n.a.	1,110	529	411

- 1.26 Enforcing laws on fishing, poaching, tree harvesting, and the use of fire is the responsibility of the Forest Police. Enforcement is weak. The Forest Police of MT have only 140 men assigned to Pantanal and their activities are restricted to the rivers around the cities of Cuiaba, Pocone, Caceres, and Barra de Burgres. The situation is worse in Corumba, MS. The Forest Police of Corumba have only 40 men assigned. The Corumba station has only nine boats (not all of which work) and is provided only 1,300 liters of gasoline per month enough to make one round trip from Corumba to the boarder with MT. These resources are not sufficient to patrol the 64,000 sq. km under their responsibility.
- 1.27 Fire control is inadequate in MS. In 1999, the Firefighter Corps was able to intervene in only 10% of the cases. The Firefighter of MS have three posts in the Upper Paraguay Basin in the municipalities of Corumba, Aquiduaana, and Jardim with a force in the Pantanal of 195.

5. Industrial and urban activities

- 1.28 Urban centers on rivers flowing into the Pantanal have grown significantly over the past two decades, especially Cuiabá and Varzea Grande. Sewage collection and treatment have not kept pace. Currently, less than 3% of the domestic and industrial wastewater is properly treated before it is discharged into the tributaries of the Pantanal. Considering only existing water connections, it is estimated that 64 metric tons of Biological Oxygen Demand (BOD) from domestic origin and 366 metric tons of BOD from industrial sources are entering per day in the tributaries of the Pantanal.

6. Tourism

- 1.29 There are three types of tourism in the Pantanal: ecotourism (observation of fauna and flora), rural/cultural tourism (visits to functioning Pantanal ranches to experience the traditional way of life), and recreational fishing. While the first two types are believed to be benign, recreational fishing (the largest by far) has an unfavorable impact and is incompatible with the other two. Fishermen, who are the primary visitors to the Pantanal, often show little concern for the environment. Many camp out on riverbanks and leave their trash behind. They often set off fireworks to commemorate a large catch, flushing any nearby birds. The boats of fishermen and tourists generate noise and water pollution that disturbs both fish and wildlife. Inappropriate boat speed is responsible for turbulence and wave action that can lead to erosion and siltation in the narrower channels.

- 1.30 Promoters of nature tourism rely on the many species of birds and their nesting areas as tourist attractions. The behavior of uninformed visitors often disturbs nesting birds, causes adult birds to take flight, knocking chicks out of their nests altogether, and exposing nesting eggs and chicks to predation. Boat drivers and guides allow tourists to walk through colonies and approach nests, visitors clap their hands and shake trees in order to startle birds and see them better. A survey of tourists indicated that they were generally unaware of their impact.
- 1.31 Properly conducted ecotourism, rural/cultural tourism, and “catch-and-release” fishing¹ are compatible with the environment and could be a source of income for ranchers. Some have already transformed their ranches into lodging accommodations and guide field trips for wildlife observation and fishing.
- 1.32 Tourism in the Pantanal needs to be structured and controlled. Tour operators, residents, and tourists need to be instructed on proper practices. Operators of lodges, campgrounds, tours and fishing boats and other providers need to be trained. To assess the potential for environmentally compatible tourism, information is needed on: (i) specific impacts of tourism activity; (ii) the infrastructure of facilities and services currently provided (the supply of services) and the institutions that support these services (both government agencies and non-governmental organizations); (iii) best practices in the provision of services; (iv) the real demand for ecotourism products; (v) the needs for training; (vi) existing regulations for tourism services and tourism-related businesses; and (vii) carrying capacity of areas that have the potential.

7. Deterioration of land threatens the way of life (culture) of the indigenous population

- 1.33 Past use of fire to clear lands has destroyed the productive capacity of the limited amounts of land available land for the indigenous population. The use of fire today occurs on smaller and depleted land plots producing quick soil degradation. Land clearing and the use of agro-chemicals (fertilizers and agrottoxics) in some indigenous areas increases environmental problems. These problems decrease economic opportunities in the community and force Indians off their lands to find employment.

D. The Bank's country and sector strategy

- 1.34 The strategy of the Bank in Brazil emphasizes: (i) reform and modernization of the public sector at the federal and state levels; (ii) improved competitiveness by supporting the financial system, small and medium sized enterprises, rehabilitation of basic infrastructure, tourism development, and regional integration; (iii) reduction of social inequality and poverty, giving priority to

¹ . Catch-and-release fishing may not be as benign as believed. Research in the U.S. and Canada has shown that post-hooking mortality and effects on reproductive behavior are significant for some species. Research on it impact on Pantanal species is included in this program.

education and health and seeking out associations with the community and civil society; and (iv) attending problems of management of the environment and natural resources.

- 1.35 The proposed program is consistent with the Bank's strategy. It supports reform and modernization of the public sector at the federal level (MMA, IBAMA) and the state level (i) by improving and enforcing environmental laws and regulations, and (ii) by promoting more effective use of public resources in the protection and provision of public goods. The program includes rehabilitation of basic infrastructure to support sustainable economic development, especially ecotourism. The program invests directly to protect critical natural habitats, recover degraded areas, and improve environmental management.

E. Environmentally related initiatives in the Mato Grosso and Mato Grosso do Sul

- 1.36 The IBRD has developed several projects in MT. The IBRD's POLONOROESTE and PRODEAGRO (Agricultural Development and Environmental Protection Project) were highly complex projects affecting the Amazon Basin of MT. Both projects took much longer to execute than originally planned. Poor institutional capacity was an important cause of delay in project execution. This Program seeks to avoid this problem by supporting the executors with a management firm and by providing training to the staff of the executing agencies.
- 1.37 PRODEAGRO was successful in developing soil management practices with local participation. It demonstrated the importance of working with communities at the micro-basin level, rather than with individual farmers. This lesson has been incorporated into the soil and pesticide management sub-program, which focuses on organized groups of farmers in micro-basins rather than on individuals.
- 1.38 Other initiatives complement the Pantanal Program. The World Bank National Sanitation Program supports sanitation infrastructure in MT. The Global Environmental Facility (GEF) finances a US\$16 million dollar program for the integrated management of the Pantanal and Alto Paraguay watershed that includes basic scientific studies of (i) heavy metal in the watershed, (ii) the impact of direct planting and other agricultural practices, (iii) habitat recovery for aquatic birds. The GEF program also strengthens the Committee for Integrated Management of the Upper Paraguay-Pantanal Basin. The French Fund for World Nature will finance a program to improve international coordination among Bolivia, Paraguay and Brazil in the management of the Upper Paraguay watershed.
- 1.39 Other organizations also have programs in the Pantanal area. The Nature Conservancy and Ecotropica (a local NGO) have purchased a large piece of land in Acurizal, near the Pantanal National Park, for conservation purposes. Conservation International is developing a project to diversify economic activities of farmers and to engage them in natural resources conservation. France is

providing a technical cooperation to establish natural parks in MS, and the World Wide Fund for Nature is developing a wildlife protection project.

F. Program concept, history and design

- 1.40 It is not a simple task to resolve the problems facing the Pantanal. The problems are a result of complex interactions between the upper and lower ecosystems, and between the socio-economic system. Until recently, the community, placed little value on conservation of environmental assets, and lacked adequate information, institutions and decision-making structures to balance competing uses of natural resources within the Basin. Saving the Pantanal will require coordinated action in a number of areas, over an extended period of time.
- 1.41 To stabilize environmental quality will require the implementation of systems to register, license, monitor and control the use of environmental resources. It requires that individuals and corporations will voluntarily comply with environmental laws and regulations and adopt of sustainable practices. Voluntary changes can only be achieved demonstrating viable alternatives. Dependable information on these alternatives and their effectiveness must be made available to a broad range of stakeholders and decision-makers. It is important to establish evaluation and feedback mechanisms that will allow incorporating lessons learned into the decision-making process and in the evolution of more efficient instruments to achieve environmental goals.
- 1.42 The large area and limited human and financial resources make it necessary to focus on priority watersheds and activities. Investment resources must be balanced between activities that must be started immediately, yet will provide their benefits in the medium to long term, and activities that will yield immediate, benefits but will not solve the problems in the Pantanal. Early investments must also to support economic activities, since sustainable economic growth will take time.
- 1.43 The breadth of interests and complex interactions in the socio-economic system affecting the Pantanal will require active, participation by civil society. Grass roots, beneficiary participation will be needed to ensure that the needs, interests, and capacities of stake holders are taken into account.
- 1.44 In 1997, the federal National Policy for Water Resources (Law No. 9433, January 8, 1997) significantly improved the legal framework for water management. The Law established the National System for Water Resources Management, that provides for (i) national planning for water resources; (ii) assigning rights to use water; (iii) charging for water rights and water use; (iv) classifying water based on potential use; and (v) monitoring information systems regarding water resources. The law also established a National Council of Water Resources, watershed committees, and water agencies as the key institutions for water resources management. The states of MT has adjusted its legal framework to be consistent with the national legislation. MS is currently discussing a draft State water law in

its Congress. Even with a new law in MS, federal law provides sufficient legal bases for improving water resources management. The Program will support the implementation of the new water resources policy.

- 1.45 The federal law on fishing requires fishing licences, sets catch limits and establishes fishing season. The state laws can make their requirements stricter than federal requirements, and both MT and MS have done so in the past few years. Both states need a scientific basis for further restriction and both need better enforcement.
- 1.46 The sustainable development program for the Pantanal was originally proposed to the Bank simultaneously by the states of MT and MS in 1995. These proposals focused entirely on improving infrastructure as the means for solving the problems of the Pantanal. Based on discussions with the Bank and other stakeholders, the proposal was expanded to include a broader range of activities that contribute to the solution of the Pantanal's problems.
- 1.47 The public was involved from an early stage. Civil society participation was formally instituted by decree in each state, and activities including hearings, meetings and workshops began in 1996. The indigenous community participated in two workshops sponsored by an NGO active in Pantanal issues, the Rios Vivos Coalition. Program design incorporated many suggestions from the workshops. Local NGOs also helped get the federal government to include the Pantanal Program in its "Brazil in Action" program in 1997.
- 1.48 Despite efforts to develop civil society participation, it proved difficult to keep diverse stakeholders informed and to institutionalize participation. The experience indicated that, significant thought and effort would be needed to find appropriate mechanisms for civil society participation. In September, 2000, two workshops were held, with Bank participation, to finalize the details of how this would be done.
- 1.49 The proposed Program is designed to implement these concepts. Recognizing it will take time to develop and implement the program is designed as a two-phase operation. The Program supports integrated institutional improvements and investments that will reduce the problems detected in the Pantanal and the upper watershed. It will improve legislation and enforcement. The Program includes investments to reduce soil and pesticide contamination from the upper watershed, and to collect information to monitor water quality. The Program protects natural resources that are at risk of being lost quickly and supports key economic activities and priority infrastructure needs.
- 1.50 The Program includes public participation in the execution of specific activities within the Sub-Programs, as well as at the program level. Finally, the Program includes substantial support to the executing agencies in program management, administration and execution, through outside consultant support, monitoring, evaluation and periodic reviews.

II. THE PROGRAM

A. Objectives

- 2.1 The Goal of this Program is to foster sustainable development in the Upper Paraguay Basin with special emphasis on the Pantanal. The Purpose of this Program is to stabilize the environmental quality of the Pantanal's ecosystems by supporting reforms in the management and conservation of natural resources.

B. Multi-phase program loan

- 2.2 The Program is designed as a Multi-Phase operation consistent with the five criteria set out in the Policy Document establishing Multi-Phase Program Loans, GN-2085:
- i. The Program requires a sustained effort to make a difference in addressing pervasive environmental problems. The first phase requires significant research and institution building. Achievement of the environment objectives requires implementation of systems to register, license, monitor and control the use of environmental resources. These systems require time to develop and implement. The implementation of the research results also takes time. The multi-phase design allows the states to develop the institutional and financial capacity to implement to implement, operate and maintain these systems. The continuity provided by a multi-phase is important in a number of sub-programs including water resource administration, soil and pesticide management, and civil society participation.
 - ii. The Program focuses on the sectoral framework for longer-term intervention. Specifically, the Program implements a recent federal law that decentralizes environmental control to Watershed Committees made up of stakeholders. The Program trains and equips these committees. It also supports modifications of local fishing laws, enforcement and environmental education.
 - iii. The Program is an effort to build ownership and sustainability through institutional change, regulatory frameworks, and civil service reform. The introduction of Watershed Committees as planning and regulating institutions is noted in the preceding paragraph. It is also worth noting Program actions in regulating the provision of tourism services, control of land use along Parkways, introduction of a framework to negotiate solutions when use of water has negative external consequences, and the assignment of responsibility of municipal beneficiaries to pay part of the costs of roads and fire fighting.
 - iv. The Program provides the opportunity to adapt and update mid-stream within the overall agreed framework. The Program has an important

public participation and review component in which civil society and the public sector jointly evaluate progress and make modifications if necessary. The Program helps civil society to participate effectively by implementing an information system and independent evaluation that make information available to the public.

- v. The Program puts emphasis on developing sustainable institutions rather than ad hoc Project Implementation Units. The Program does have a large executing unit at the Federal level in recognition of the current institutional weakness at the State level. However, the executing units at the state level are small and located within the state environmental agencies. The agencies themselves are expanded significantly and will be trained to take on these functions for the second phase. In addition, the Program emphasizes the development of sources of revenue for watershed administration, road maintenance, parks, and fire departments.

- 2.3 By 2010, a year after the end of the second phase, the Program should have achieved the following measurable results. First, the water of the Cuiaba and Miranda Rivers that enters the Pantanal should attain Class II quality standards with special emphasis on the standards for dissolved oxygen and sediments, and there should be substantial improvement in the quality of the Taquari River. Second, the populations of the 10 principal species of commercial fish should be stable or increasing. Third, the amount of the watershed under designated protection should have increased to 2,000,000 ha (5% of the land area in the Upper Paraguay Basin) from 546,206 ha (1%) in 1999. Finally, sustainable activities should have increased, specifically aquaculture production in the Upper Paraguay Basin should have increased from 8,850 to 13,275 metric tons and the number of tourist visitors should have increased by 50% over the number registered as part of the Program's baseline indicators in 2001.

C. Trigger indicators for the second phase

- 2.4 Certain achievements in the first phase are necessary to achieve the development results listed above. The two key achievements necessary to bring rivers to Class II standards are the development of a register of water users and the passage of a water law in MS. The first target indicator is a register of all users in the Cuiaba, Miranda and Taquari watersheds who extract water from surface or ground sources and all users who discharged waste into water courses. The register includes: volume taken and volume and type of waste discharged. This information is critical to regulate the use of water and to have information to base fees for right to use and volumes extracted or discharged. The second key achievement is that the States of MT and MS send out bills to all users who extract or discharge waste in the Cuiaba, Miranda, and Taquari watersheds for the right to use water, and that the watershed committees have decided on the charging scheme for volume of water extracted or discharged. This achievement is important because it provides evidence that the two environmental agencies are

developing the financial capacity to expand and sustain the water resource administration and other actions for environmental control.

- 2.5 A third achievement has to do with stabilizing the population of commercial species of fish. It is evidence that new fish legislation (or regulations), based on Program research, on catch limits, fishing seasons, and number of licenses has been approved and is being enforced and that the system of fishery statistics has provided at least one full year of data on capture effort with which to monitor the recovery of the commercial fish population. Proper and enforced fish legislation is a necessary condition for stabilizing fish populations. A functioning statistical system is necessary to monitor the success of the effort.
- 2.6 A fourth achievement signals progress towards protection of habitat fish and wildlife. It is evidence that 20% of the land in the state parks of the Program and that an additional 20% of the land in federal protected areas of the Program is owned by the federal government (or has demonstrated land use controls consistent with the management of the parks). Ownership or control of land is critical because it ensures control of use for preservation, vegetation is a direct measure of a stabilized environment.
- 2.7 A fifth achievement is necessary to ensure that tourism is environmentally sustainable. The achievement is evidence that guides in the Pantanal are licensed and trained and that campgrounds, fishing lodges, and fazendas with guest lodgings in the Pantanal have environmental licenses and are inspected at random annually and that the results of the inspection are reported as well as the sanctions applied for non-compliance. These are proxies for greater control of environmentally damaging impacts.
- 2.8 A sixth achievement is related to public information, participation, and support for the Program. The achievement is that all studies for projects for the second stage are presented to civil society members of the State Committees and all objections are noted in writing for the consideration of the government (State Secretaries of the Environment, the Ministry of Environment) and a future project team.
- 2.9 A seventh achievement relates to financial sustainability. It is the presentation of accounting statements that show that the mechanisms for cost recovery for maintenance of rural roads, support for firefighters, and for federal and state parks are efficiently implemented and generating cash flows to partially support the respective activities.

D. Description of sub-programs and projects

- 2.10 To stabilize the quality of the Pantanal's ecosystems, the Program has seven sub-programs: (i) administration of water resources, (ii) soil and pesticide management in critical sub-watersheds, (iii) protection and management of habitat, fish and wildlife (iv) urban sanitation, (v) support for sustainable

economic activities, (vi) parkways and roads, and (vii) environmentally sustainable activities in indigenous areas.

1. Administration of water resources (US\$ 13.5 million)

- 2.11 The Goal of this sub-program is to improve the quality and availability of surface and ground water. The Purpose of the first phase is to monitor and regulate the use of water in the highest priority areas: the Rio Cuiaba watershed in MT, and the Rio Miranda and Rio Taquari watersheds in MS (map 3). The second phase will extend monitoring and regulation to the rest of the Upper Paraguay Basin. This sub-program implements five projects to (i) monitor surface and ground water quality, (ii) implement an information system to manage surface and ground water, (iii) assign, regulate and charge for the right to use ground and surface water, (iv) implement a water management system that is decentralized to the watershed level, and (v) monitor hydrological flows and issue flood warnings.
- 2.12 Implementation activities to be financed include studies and technical assistance for developing and implementing systems for assigning, regulating and charging for water rights; acquisition and installation of water quality and hydrometeorological measuring equipment and associated computer information systems to house the databases, technical assistance for compiling existing data, training for using the equipment, developing and implementing hydrologic models, and support for implementing regional watershed committees and state environmental management units.

2. Soil and pesticide management in critical sub-watersheds (US\$20.5 million)

- 2.13 The purpose of this sub-program is to reduce the amount of silt and agrotoxics that enter critical sub-watersheds. The first phase addresses the Rio Vermelho and Rio San Lorenzo sub-watersheds in MT and the Rio Miranda and Rio Taquari sub-watersheds in MS that have critical erosion problems. The second phase will extend the effort to other sub-watersheds with serious problems. The sub-program will finance the preparation and implementation of integrated micro-watershed management plans and pilot projects. Activities to be financed include large-scale mapping and field assessment for selection of micro-watersheds, planning, technical assistance, and training. Implementation activities include: (i) establishment and protection of buffer areas (gallery forests) along water courses and springs to prevent entry of sediments and agrotoxics, (ii) reconstruction of rural roads to reduce erosion problems, (iii) adoption of new soil management practices (direct planting, no-till soil preparation, "green fertilizers", and terracing) to reduce erosion.
- 2.14 MT has significant problems with unlicensed mining activities and degraded mining areas that cause significant siltation and water quality problems. To address these problems MT has projects to license and control mining operations and to recover areas degraded by past mining activities. The sub-program will

finance: (i) technical assistance to register miners and train them in techniques needed to comply with environmental law; and (ii) mapping, design and implementation of recovery plans for abandoned and degraded areas along the Rio Poxoreo and Rio Coite (map 3). Activities to be financed include construction of retention dikes, terraces, drainage canals, and revegetation. The second phase will implement similar activities in the upper Cuiabá watershed.

- 2.15 There are large-scale landslides and floods along the lower Rio Taquari in MS that result in rapid changes in the riverbed, large fish kills and loss of pasture (map 3). To address this problem, the Program includes: (i) a pilot study to develop cost-effective measures against landslides and floods, (ii) geomorphological and socio-economic studies to develop long-term, feasible solutions for the problems of the Rio Taquari.

**3. Protection and management of habitat, fish and wildlife
(US\$12.5 million)**

- 2.16 The purpose of this sub-program is to preserve representative ecosystems and to protect the Pantanal against destruction of natural vegetation, poaching and over-fishing. This sub-program comprises projects to (i) consolidate national parks and implement newly declared state parks; (ii) establish a biosphere reserve; (iii) implement protected fish reserves in spawning areas, (iv) equip and train public officers, volunteers, forest police and firefighters who enforce fishing regulations and control poaching and illegal fires, (v) studies for new parks that will be implemented in the second phase; and (vi) studies to determine mechanisms to pay for environmental services and to acquire control of land within parks without having to purchase it.
- 2.17 During the first phase, the sub-program will finance four federal protected areas (the Pantanal National Park, Chapada dos Guimaraes National Park, the Taima and Serra as Araras Ecological Stations.) and four state parks (Lagoa Azul-MT, Pantanal do Rio Negro-MS, Nascentes do Rio Taquari-MS, and the Rotas Monçoeiras/Coxim Scenic River-MS.) The activities financed are mapping, fencing, preparation of public use management plans, construction of visitor and administrative centers, training and equipping rangers and administrative staff (vehicles, boats, computers). The parks in the first stage have already been established. Those to be financed in the second phase are to be identified by studies financed in the first phase.
- 2.18 The program will also establish fish reserve areas in which fishing and boating are limited. The program will finance the markers that identify these areas and equipment and training for the control agents who will police the area.
- 2.19 To better enforce fishing legislation, control poaching and control illegal land clearing and fires, MS will increase the number of forest police by 50 from 329

to 379) and MT will add 20 officers in Pocone, Caceres, Barao de Melgaco, Barra de Burges, and Rondonopolis in 2001.² The Program will finance the construction of control post, boats, vehicles, computers, communications equipment, and training. In MS, the majority of this equipment goes to detachments stationed in Porto Murtinho and Corumba, the two most important departure points for fishing in the Pantanal. Some also goes to new control points in Rochedo, Aquidauana, and Costa Rica (see map 4). In MT the equipment will go to Pocone, Caceres, Barao de Melgaco, Barra de Bugres, and Rondonopolis.

- 2.20 To improve its program of fire prevention, MS will expand its firefighter corps by 120 (from 150 to 270). These firefighters will be assigned to two new fire stations in Bonito, and Coxim (map 3). The Program will finance the construction and equipping of new fire stations in Bonito and Coxim, and additional equipment for three existing stations (Corumba, Aquidauana, and Jardim), and a public education program on fire prevention. At least 100 volunteers will be trained in fire fighting and equipped. In the second phase, MS will add three new fire stations and another 120 firefighters in Porto Murtinho, Costa Rica, and Miranda and MT will also expand its force.

4. Sanitation (US\$ 27.4 million)

- 2.21 The purpose of this sub-program is to improve the quality of rivers that are tributaries of the Pantanal. The first phase focuses on nine cities in MS. The state water company of MS ranked 22 cities on (i) location relative to the Pantanal, (ii) importance of tourist activities, and (iii) sanitary and environmental problems. It selected the top 9 cities. Four are in the Pantanal (Corumba, Ladario, Miranda, and Porto Murtinho). The other five are close to the Pantanal, have high to medium tourism importance, and significant environmental problems: Aquidauana, Bodoquena, Bonito, Coxim, and Rio Verde.
- 2.22 The sewerage works financed by the Program include collection networks, interceptors, pumping stations and treatment plants. The program also finances works to reduce water losses and improve efficiency. The works consist of rehabilitation and improvements of existing facilities: intakes, piping, storage tanks, purification plants. The water projects are necessary to improve the operational efficiency (financial viability) of the system and ability to maintain sewerage systems.
- 2.23 In MT, during the first phase, the Program will finance the institutional strengthening of a new municipal water company in Cuiaba, including a management contract and minor investments in metering and loss reduction. The Program will also finance feasibility studies for expanding sewerage and treatment in other municipalities of MT in the second phase.

² . MT increased its force by 60 in 1999 in the municipalities of Caceres and Barra de Bugres in 1999.

- 2.24 The urban sanitation subprogram also finances preparation of a strategic plan for the integrated management of solid waste in the Upper Paraguay Basin and feasibility studies for the implementation of the plan in the second phase. The strategic plan will: (i) identify the current problems, (ii) analyze the management capacity of the municipalities, (iii) determine priorities and identify alternative technical, financial, and institutional solutions, and (iv) develop technical, financial, and institutional studies for priority projects.

5. Support for sustainable economic activities (US\$11.1million)

- 2.25 The objective of this sub-program is to stimulate economic activities that do not adversely affect the environmental quality of the Pantanal. This program has three components: fish production and fisheries management, ecotourism, and sustainable agriculture.
- 2.26 The purpose of the fish production and management sub-program is to ensure that fishing and fish production are a sustainable source of income. It has three activities. The first is research on the biology, genetics and pathologies of the ten main species of commercial fish. This research will result in improved local legislation with respect to fishing limits (size and amount of capture), seasonal restrictions, no fishing zones, permitted fishing equipment, and the preparation and distribution of technical manuals for aquaculture. The Program also finances research on the control of the tucunare, an invasive species from the Amazon Basin, that is preying on Pantanal species. The second activity is a fish gene bank to be used for aquaculture and reintroduction of species in depleted areas and training in aquaculture. The third implements a statistical system for fisheries to improve the monitoring and administration of fisheries.
- 2.27 The purpose of the tourism/ecotourism sub-program is to attract segments of the market that will not damage the environment and that will generate income for the local population, particularly the residents of the Pantanal. The first phase, focuses on improvement of ecotourism in the Pantanal; the second phase expands the effort to the entire Basin.
- 2.28 The Program will finance a master plan to develop ecotourism in the Upper Paraguay Basin. The plan has seven principal parts: (i) a diagnosis of the facilities and services currently provided (the supply of services) and a diagnosis of the institutions that support these services, (ii) a study of the Brazilian ecotourism market, (iii) an assessment of needs for training, (iv) a study of, and guide for, best practices in the provision of services, (v) an analysis of existing regulations for tourism services, recommendations for improvement and a reference guide on sources of finance for investors, (vi) a tourism information system, and (vii) plans for development of areas with tourism/ecotourism potential in the Basin.
- 2.29 During the first phase, the Program will also finance workshops in ecotourism and awareness campaigns in four priority areas in the Pantanal (Pocone and Barao de Melgaco in MT and Corumba and Bonito in MS, see map 3). In addition, the

Program will finance computers and equipment for the two state tourism authorities. Finally, the Program will finance the implementation of some of the systems developed in the master plan: hardware, software, and training for the management of the tourist information system, priority training in areas detected in the needs assessment, the publication and distribution of a "best practice" manual, and visitor control infrastructure for the Grutas Lagoa Azul and N. Sa. Aparecida.

- 2.30 The purpose of the sustainable agriculture component is to provide greater income to farmers and ranchers in the Pantanal to allow them to exploit the Pantanal in an economically and environmentally sustainable manner. One set of projects directly supports cattle production. It finances: (i) a study of the potential for trade-marking and "environmental" certification of beef and other products of the Pantanal; (ii) compilation of existing technical information on improved pasture, herd management, marketing and sources of finance for business plans; and (iii) dissemination of the results of the studies. Another set of projects supports diversification: (i) demonstration projects for the production of two species of wildlife during the first phase (capivara, and rhea) and three species during the second phase (peccari, iguana, and teiú); (ii) the preparation of a technical manual for commercial production of Jacaré; (iii) a pilot project in feral pig management (private hunting and trapping)³; (iv) manuals on techniques to produce environmentally compatible alternative products and assistance to develop marketing chains and obtain credit. The second phase of the Program will provide technical assistance to start production of these products.

6. Parkways and roads (US\$ 51.0 million)

- 2.31 The purpose of this sub-program is to guarantee all-year access to parks and attractions for ecotourism, provide evacuation routes for cattle during flood season, and facilitate protection of habitat by giving better access to firefighters and environmental enforcement agents.
- 2.32 The Program includes two types of roads: (i) parkways (roads that are located in scenic areas with little development and where control of land use is important) and (ii) roads that serve areas with tourism development or tourism potential.
- 2.33 The first phase finances 106 kms of legally designated "parkways" including: improvement and paving of the 24 km Piraputanga-Palmeiras-Camisao Parkway (MS-450), the 74 km Santo Antonio-Barao de Melgaco Parkway (MT-040/361), rehabilitation of the 8 km Chapada dos Guimaraes-Mirante Parkway (MT-251 and MT-351). The parkways will have buffer areas that extend 300 to 500 meters on each side that preserve the scenic beauty. While the buffer area is private property, private owners must maintain the present use of land. No new buildings

³ . The private hunting reserve project for feral pigs generate fees and has wildlife management benefits. It reduces the spread of diseases and the depletion of pastures caused by feral pigs.

and business will be allowed unless they are included in the respective management plans, no new agricultural crops, or cutting of woodland will be permitted. The parkways will have control booths at the entry, a visitor center, pull-out areas for scenic views, and trails.

- 2.34 The first phase will also finance raising the access ramps and the replacement of 31 of the 124 bridges of the Transpantaneira Parkway (MT-060) that have either collapsed or are in a precarious state. It will also raise the road bed of nine segments (2,400 meters) that are covered by water in flood season. It will provide equipment to maintain the surface. These measures will make the Transpantaneira transitable year round.
- 2.35 The first phase will also improve and pave the 16 km Pocone-Posto IBAMA road (MT-060) that is the entry to the Transpantaneira and the 70 km Bonito-Bodoquena road (MS-178) that gives access to existing ecotourism activities and a newly created national park. It also finances the preparation of land use management plans for Bonito and Bodoquena and a regional environmental management plan for the area surrounding.
- 2.36 The first phase also provides US\$ 1.5 million for the environmental management plans, economic feasibility studies, and final designs of the Transpantaneira Parkway (MT-060), the Jaciara-Cachoeira da Fumaca Parkway (MT-457), the Pocone-Porto Cercado Parkway (MT-370), and the Pantanal Parkway (Porto da Manga-Ladario (MS- 184/228), all of which will be considered for the second phase.

**7. Environmentally sustainable activities in indigenous areas
(US\$4.8 million)**

- 2.37 The purpose of this sub-program is to implement sustainable land use activities on indigenous lands. In MS, the program finances: (i) community organization to plan, execute and maintain projects, (ii) restoration of gallery forests and native vegetation along streams and rivers, (iii) planting of seeds and seedlings on native lands, and (iv) technical assistance for the reintroduction of traditional agricultural products and natural fertilizers to restore land productivity, and (v) the construction of fences and introduction of small scale capivara production for own consumption. In MT, it finances (i) community organization, (ii) training in economically sustainable practices, and (iii) identification of, and training in, culturally appropriate activities. Both state programs have an evaluation study that will recommend actions for the second phase.

E. Program costs

- 2.38 The total cost of the Program is estimated at US\$ 400 million. The first phase will cost the equivalent of US\$ 165 million; the second phase will cost US\$ 235 million.

COST TABLE (in thousands of US\$)				
	IDB	Local	Total First Phase	%
1.0 ENGINEERING AND ADMINISTRATION				
1.1 Administration and Supervision	\$3,200	\$3,767	\$6,967	4.22%
1.2 Management Firm	\$5,700	\$0	\$5,700	3.45%
2. DIRECT COSTS				
2.1 Water Resource Administration	\$9,400	\$4,100	\$13,500	8.18%
2.2 Soil and Pesticide Management	\$16,400	\$4,100	\$20,500	12.42%
2.3 Protection of Habitat, Fish & Wildlife	\$11,300	\$1,250	\$12,550	7.61%
2.3.1 Parks	\$8,200	\$700	\$8,900	5.39%
2.3.2 Forest Police	\$1,500	\$100	\$1,600	0.97%
2.3.3 Firefighters	\$1,600	\$450	\$2,050	1.24%
2.4 Urban Sanitation	\$6,600	\$20,800	\$27,400	16.61%
2.4.1 Water	\$0	\$6,800	\$6,800	4.12%
2.4.2 Sewerage	\$0	\$14,000	\$14,000	8.48%
2.4.3 Institutional Strengthening of Cuiaba	\$5,500	\$0	\$5,500	3.33%
2.4.4 Solid Waste	\$1,100	\$0	\$1,100	0.67%
2.5 Support for Sustainable Activities	\$9,900	\$1,200	\$11,100	6.73%
2.5.1 Fisheries	\$6,550	\$800	\$7,350	4.45%
2.5.2 Ecotourism	\$2,400	\$100	\$2,500	1.52%
2.5.3 Agriculture	\$950	\$300	\$1,250	0.76%
2.6 Parkways and Roads	\$16,825	\$34,175	\$51,000	30.91%
2.7 Environmentally Sustainable Indigenous Areas	\$0	\$4,800	\$4,800	2.91%
3.0 OTHER COSTS				
3.1 Evaluation	\$1,750	\$0	\$1,750	1.06%
3.2 Participation of Civil Society	\$600	\$0	\$600	0.36%
4.0 FINANCIAL CHARGES				
4.1 Interest	\$0	\$7,796	\$7,796	4.72%
4.2 Credit Fee	\$0	\$512	\$512	0.31%
4.3 Inspection and Supervision	\$825	\$0	\$825	0.50%
Total Cost	\$82,500	\$82,500	\$165,000	100%
Share of Cost	50%	50%	100%	

F. The financial plan

2.39 The Bank will finance 50% of the Program's cost, US\$ 82.5 million in the first phase, from Ordinary Capital Resources. The GOB is responsible for providing the local counterpart. It expects to finance part of its contribution with a loan from Japanese Bank for International Cooperation, and it expects that the States of MT and MS will contribute 12.5% of the costs.

2.40 The loan will have the following terms:

Source of resource	Ordinary capital
Amount	US\$82.5 million
Amortization	20 years
Grace period	4 years
Disbursement period	4 years
Interest rate	Variable
FIV	1% of the loan
Commitment fee	0.75% of the amount not disbursed
Currency ⁴	EURO 95,265,589

- 2.41 The Government of Brazil requested the use of the Single Currency Facility denominated in Euros.

G. Recognition of expenses

- 2.42 Using procedures substantially similar to those specified in Annex C of the loan contract, the MMA and the states have incurred expenses estimated at US\$ 1 million in Program preparation since June 6, 1999 These expenditures will be verified and up to US\$ 1 million will be recognized as counterpart.

⁴ Exchange rate of November 3 from Telerate Services.

III. EXECUTION

A. Execution Plan

1. Overview

- 3.1 The Ministry of Environment (MMA), through its Secretariat for Environmental Quality in Human Settlements (SQA) is the executor of the program. The Program has three sub-executors: (i) the Brazilian Institute for the Environment and Natural Resources (IBAMA), (ii) the State of MT through its Environment Foundation (FEMA-MT), and (iii) the State of MS through its Secretariat of the Environment (FEMA-P). The executor and sub-executors will each have an executing unit, responsible for financial and administrative management activities of the project, that will ensure that Bank procedures are followed for procurement, accounting, and documentation. A management firm will assist the executing units in these tasks. Technical execution will be the responsibility of executors and other participating institutions. Prior to first disbursement the Borrower must submit the following agreements (prepared in accordance with a draft previously approved by the Bank) duly executed: between the Borrower and MS, MT, IBAMA, FEMA-MT, FEMA-P, EMPAER-MT, and EMPAER-MS.
- 3.2 The institutions will have the following functions and responsibilities:
- a. The executing unit in the MMA will be responsible for overall execution of the Program, administration of resources, accounting, supervision and monitoring. It will be the only counterpart of the Bank.
 - b. The executing unit in each state will be responsible at the state level for supervising, coordinating and reviewing activities of the participating institutions. The units will be the link between the executing unit of the MMA and the participating institutions. IBAMA will be responsible for supervising the federal parks, fish and wildlife components.
 - c. The participating institutions are the specialized organizations in each state that will be responsible for supervising the execution of the sub-programs. They will prepare the disbursement requests that will be reviewed by the state executing unit and then presented to the executing unit in MMA.
 - d. A management firm will assist the executing units with administrative, financial and public bidding functions.
- 3.3 Reporting, monitoring and supervision of the Program will be based on an internal control system developed by the MMA. It will be based on Annual Operating Plans agreed upon with the Bank (see ¶ 3.71). The Bank will have a "start-up" mission, an institutional review at the end of the first year, a mid term review and a review at the end of the third year.

- 3.4 Public participation is an integral part of a number of the sub-programs, ensuring grass roots participation in the execution of specific activities. The executors will establish four public information centers. The Program also will establish State Committees, and one Inter-State Committee as consultative groups for civil society for the Pantanal Program. The State Committees will have access to all technical, monitoring and evaluation reports and will have the opportunity to review and comment.
- 3.5 The Program includes an independent evaluation of progress towards the benchmarks established for each sub-program, and the effectiveness of the institutional mechanisms, public participation, and the indigenous program. It will also evaluate progress towards meeting the trigger mechanisms for the second phase of the operation.

2. The executor and the executing unit

- 3.6 The Ministry of Environment (MMA) will create an executing unit that reports to the Secretariat for Environmental Quality in Human Settlements. The Executive Committee for the Program, which consists of the Secretary for Environmental Quality of the MMA, the President of IBAMA, and the Secretaries of Environment of MT and MS, will provide overall guidance for the Program. This Committee is needed to ensure that the actions of two states that affect the Pantanal are compatible and to keep a clear focus on priority objectives in case the institutions that participate come into conflict.
- 3.7 The executing unit will: (i) coordinate and supervise the activities of the Program's sub-executors; (ii) make all disbursements of Bank resources, do accounting according to the Bank requirements, prepare annual financial statements and other information the Bank requires; (iii) ensure timely provision of the federal government's counterpart; (iv) administer the bank accounts of the Program; (v) assist the participating institutions in bidding and contracting procedures; and (vi) be responsible for the fulfillment of all contractual clauses.
- 3.8 The executing unit will have a General Coordinator and technical management units for (i) water resources, (ii) habitat, fish, wildlife, and agriculture, and (iii) urban environment. The General Coordinator will also have staff for administration, accounting, monitoring and evaluation, training, indigenous and civil society issues. The executing unit will have the support of a management firm for administrative, financial and public bidding procedures.
- 3.9 The technical management units will coordinate execution. They will provide technical support to the sub-executors, review terms of reference, reports, studies, and other outputs of the Program. They will oversee progress in the achievement of the indicators of the sub-programs according to schedule.
- 3.10 An administration and accounting specialist will be responsible for budgets and financial planning, accounting, disbursements, presentation of financial

statements, tracking the financial progress of civil works, and administrative tasks. A monitoring and evaluation specialist will keep track of the physical and financial timetables of the overall program. A specialist in indigenous and civil society issues will organize and provide program information to the general public, interested stakeholders, participants and decision-makers of the Program.

- 3.11 Prior to first disbursement, the Borrower must demonstrate that it has legally established the Program's executing unit and staffed it with appropriate personnel.

3. Sub-executors

- 3.12 There are three sub-executors: (i) the Brazilian Institute for the Environment and Natural Resources (IBAMA), (ii) the State Environment Foundation of Mato Grosso (FEMA-MT), and (iii) the State Foundation for the Environment and Pantanal (FEMA-P). These three executors will set up executing units that will be the only counterparts of the MMA. Sub-executors will be responsible for: (i) the submission of accounts to the MMA's executing unit for eligible expenditures; (ii) the maintenance of separate and specific financial and accounting records of the Program; (iii) the maintenance of filing system for the supporting documentation of Program expenditures, which should be available for review by the Bank's officials and by the program's external auditors.
- 3.13 IBAMA's executing unit will be responsible for execution of the protected areas program, and fish and wildlife components. It will have a general coordinator, a financial and administrative specialist and a monitoring and evaluation specialist.
- 3.14 The state executing units are responsible for approving all bidding documents, terms of reference, and contracts for services. They will chair bidding committees, adjudicate contracts, and review documentation that supports requests for payment of contractors, consultants and other expenses. They will send this documentation to the MMA for final approval. The state executing units will be responsible for ensuring that state counterpart resources are available in a timely manner. They will oversee the financial and management activities of participating institutions. They will ensure that these institutions will follow Bank procedures for procurement, accounting, and documentation. The management firm will also assist the state executing units.
- 3.15 Each state executing unit will be managed by a General Coordinator and will have three specialists, one for water resources and soil management, another for habitat, fish, wildlife, and agriculture, and a third for urban environment (water, sanitation and solid waste). Their task is the coordination, control, and review of the work of the operating divisions of State Foundations for the Environment of MT and MS and of the participating institutions (see the table below).
- 3.16 Prior to first disbursement, the Borrower must demonstrate that Executing Units have been legally established in IBAMA and the States of MS and MT and that they are staffed with appropriate personnel.

4. Management firm

- 3.17 The MMA will contract a management firm to assist the federal and state executing units and IBAMA with administrative, financial and public bidding procedures. The firm will also train the state executors in these processes. The Bank has prepared draft terms of reference for the firm. Prior to first disbursement, the Borrower must present terms of reference and bidding documents, acceptable to the Bank, for hiring the management firm and must provide evidence that it has follow appropriate procedures prior to issuing them. Before initiating the contracting of any good, service, work or study, the borrower must have contracted a management firm. The only exceptions are the following studies supervised by the MMA or IBAMA: (i) the baseline evaluation of the program, (ii) study to identify priority areas for conservation, (iii) study of fish biology, (iv) study to identify best practices for commercial production of alligator, (v) study of the impact of Tucunare, and (vi) contracting consultants for executing units.

5. Participating institutions

- 3.18 FEMA-MT, FEMA-P, IBAMA, and participating state institutions will have technical and administrative responsibility for the sub-programs under their technical jurisdiction.
- 3.19 The institutions (with the exception of the Forest Police, Firefighters, and FUNAI) will designate special procurement committees, chaired by their state executing agency, to contract consulting services and administer bidding procedures. The participating institutions will supervise execution of their projects, review the progress of work, and prepare requests for payments for consultants or contractors for review and approval by the executing units of the states. The participating institutions will provide all financial information related to the project to the state executing units, which will consolidate it.

- 3.20 The table below summarizes sub-program execution responsibility by institution.

Institution	SUB-PROGRAM OR COMPONENT
MMA	Ecotourism Biosphere reserve
IBAMA	Protection of habitat, federal parks, fish and wildlife, Sustainable agriculture
FEMA-MT	Administration of water resources Recovery of mining areas State parks Institutional strengthening of the Cuiaba water company Solid waste studies Parkway management plans Sustainable agriculture Environmentally sustainable activities in indigenous areas
FEMA-P	Administration of water resources Studies for the Taquari River State parks

	Parkway management plans Solid waste studies Sustainable agriculture Environmentally sustainable activities in indigenous areas
EMPAER-MT	Soil and pesticide management in critical sub-watersheds
EMPAER-MS	Soil and pesticide management in critical sub-watersheds
SANESUL	Potable water and sanitation
DVOP	Parkways and roads
DERSUL	Parkways and roads

B. Execution and operation of the sub-programs

1. Administration of water resources

- 3.21 FEMA-MT and FEMA-P will execute this sub-program using their own technical staff. Execution consists of acquiring equipment, contracting studies, database design, hydrologic model development, training and other services.
- 3.22 The FEMAs will contract studies to review existing legislation, procedures in other countries, and develop economic and institutional models for assigning, regulating and charging for the right to use ground and surface water for each state. The studies will use inputs from other activities of the sub-program, such as the cadaster of users and hydrologic balances, to develop alternative proposals that will be presented to the watershed committees and other stakeholders for discussion, comment, and eventual recommendation to the state agencies for adoption. The consultancies will provide the state agencies with the recommendations and draft implementing regulations.
- 3.23 The FEMAs will contract for the purchase and installation of monitoring equipment for surface and ground water quality and hydrometeorological data. These contracts will include operation and maintenance for the first year and training of staff in collecting data and maintaining equipment. MT will hire a private consulting firm to perform the data collection for water quality monitoring, while MS will use its own technical staff. Consultants will develop water quality and hydrologic models, registers of users, design of database systems.
- 3.24 The FEMAs will also contract studies to organize and support watershed committees by developing committee structures, operating regulations and providing technical training for committee members and support staff. The state agencies and the municipalities will provide support staff. Equipment and training will be provided to the watershed committees.
- 3.25 Within eight months of the signature of the contract, FEMA-MT and FEMA-P should demonstrate that they have hired the required personnel for project supervision.

2. Soil and pesticide management in critical sub-watersheds

- 3.26 EMPAER-MT and EMPAER-MS will establish coordinating units responsible for all technical and administrative aspects of the soil and pesticide management sub-program, including supervision, monitoring, record-keeping and reporting. The coordinating units will report to the state executing unit. Existing regional and local offices of the EMPAERs will execute the activities. In addition, the state executing unit will contract private agricultural extension companies to expand the coverage of the sub-program in MT.
- 3.27 Operating Regulations will guide execution of this sub-program. The regulations describe the objectives, strategy, components and goals. The strategy is based on raising the awareness of rural producers and their families of the importance of conservation and recovery of natural resources in farm management. It is based on participatory planning and implementation of integrated micro-watershed plans. The Operating Regulations specify the roles of the municipalities, community organizations and producers in the sub-program. Prior to the first disbursement, the Borrower must submit evidence that the Operating Regulations for this sub-program, agreed with the Bank, have been adopted by the EMPAER's.
- 3.28 The EMPAER's will establish the priority for actions in micro-watersheds on the basis of actual and potential erosion. The indicators of potential erosion include soil type, slope and land use. Based on initial screening, municipalities and landowners in the critical micro-watersheds will participate in final selection and develop integrated micro-watershed plans and individual parcel plans, using a participatory, consensus-building approach. Beneficiaries will receive technical support from extension activities of the sub-program. Landowners and the coordinators of the sub-program must approve the plans. After the plans are approved, landowners will enter into an agreement with the EMPAER to implement the activities. The agreement will include, as a condition of participation, a commitment to maintain the rural roads and associated erosion control measures included in the plan.
- 3.29 The program will pay for 50% of the cost of qualifying activities (terracing, no-till planting, recovery of rural roads, etc.) and 100% of the cost of recovery of riparian gallery forests because of the positive externalities and the opportunity cost to farmers. The program has established maximum unit costs for these activities. Producers will have a maximum subsidy of US\$ 3,000. Each micro-watershed will receive a maximum of \$72,000 to be distributed among the producers. Producers with less than 500 hectares are eligible for the financial assistance of the program. Landowners with more than 500 hectares are eligible only for support for recovery of riparian gallery forests. The program will finance riparian recovery on no more than 2% of the total land area in any micro-watershed.

- 3.30 Landowners, with the support and oversight from the EMPAER, will participate in the selection of service providers and will supervise the execution of the services according to approved micro-watershed plans. Contracting, payments and accounting will be done by the state executing units.
- 3.31 The state executing unit of MT will contract services for reclaiming mining areas, and MS will contract studies for the Rio Taquari. The studies for the Taquari try to develop alternatives to slow the mudslides, erosion, and rapid siltation that has changed the course rivers and ruined thousands of hectares of ranch land in the Pantanal.

3. Protection and management of habitat, fish, and wildlife

- 3.32 The Directorate of Conservation Units and Wildlife of IBAMA will execute the projects in federal protected areas, contracting out the works and the studies to develop implementation plans for four new national parks. IBAMA will also head a joint task force with the states to develop implementation plans for four new state parks. FEMA-MT and FEMA-P will have technical responsibility for the projects to consolidate parks in their respective states. The state executing units will contract out the activities associated with services and works.
- 3.33 The state executing units will conduct the bidding for equipment and construction for the Forest Police and Firefighters. Prior to the publication of the bidding documents for the acquisition of equipment for the Forest Police in MT and MS respectively, the Borrower must submit evidence that: MT has hired 20 additional officers and MS it has hired 50 additional officers for the areas that receive the equipment. These officers are needed, as indicated in ¶ 1.26, because the current number is inadequate to enforce environmental law in such a large area.
- 3.34 Prior to the publication of bidding documents for the construction of a fire station in a municipality, the Borrower must provide evidence that the municipality has signed an agreement with the Firefighter Corps to pay for energy, water and utility costs, the operation and maintenance of equipment, and part of the replacement cost of light equipment directly used to combat fire. Prior to the publication of bidding documents to equip a new station the borrower must provide evidence that the State of MS has assigned 60 firefighters for each of the two new fire stations. These firefighters man the new firestations twenty-four hours a day.

4. Urban sanitation

- 3.35 SANESUL will prepare final designs and bidding documents, participate in bidding committees, and supervise the execution of the sanitation works in MS. There will be independent third party supervision paid for by funds from the loan.
- 3.36 SANESUL has been taking action to improve its financial position to ensure that the accounts collection improves and the debt is reduced. It is recommended that,

prior to publication of bidding documents for the first work to be supervised by SANESUL, the Borrower provide evidence that it has executed an agreement with SANESUL that requires that: SANESUL has a satisfactory plan to improve its efficiency and cash-flow.

- 3.37 The state-executing unit of MT will coordinate the municipal actions necessary to set up a municipal water company in Cuiaba. It will contract an internationally known accounting firm to prepare audited financial statements. It will supervise the process of contracting a private operating company to manage the municipal company for a period of four years.
- 3.38 Successful execution of the sub-program in MT depends on institutional agreements. Prior to the disbursement of funds to execute the sanitation sub-program in the State of MT, the Borrower must submit evidence that (i) it has executed an agreement with the Municipality of Cuiaba, in accordance with the draft previously approved by the Bank, (ii) the new water company for Cuiaba's Municipality has been formed and (iii) it has a four year operating contract with a private operator. The private operating company is necessary because it currently has no management other than the regulatory agency and its operation is characterized by water losses greater than 60% and poor collections. A private operating company is more likely to achieve a financial recovery of the company than municipal management.
- 3.39 Once these conditions have been met and the company is financially viable, the state executing unit will issue bids for meters and civil works, and the municipal water company will supervise execution. An independent third party, paid with funds from the loan will also supervise the works. The state executing unit will chair the bidding committee, and municipal authorities and the private operating firm will participate.
- 3.40 The state executing units will contract the strategic plan for the integrated management of solid waste in the Upper Paraguay Basin and the feasibility studies for the implementation of the plan in priority municipalities, for both states. FEMA-MT and FEMA-P will do the technical supervision.

5. Support for sustainable activities

- 3.41 The sub-program of support for sustainable economic activities has three components: (i) fisheries management, (ii) ecotourism, and (iii) sustainable agriculture.

a) Fisheries Management

- 3.42 Fisheries are a shared responsibility of the federal government (IBAMA) and the states (FEMA-MT and FEMA-P). IBAMA's National Center for Research on Tropical Fish will contract out fisheries research on species, populations, migratory patterns, genetics, pathogens, and technical training. It will do research

on fish genetics and pathology with its own staff. A committee comprised by IBAMA and the state executing units will contract out the work to set up the aquaculture projects and train interested parties.

b) Ecotourism

- 3.43 The MMA will administer the bidding process and, with the assistance of the states, will supervise the development of the master plan for ecotourism development. The State Secretariat of Tourism in MT and the Superintendency of Tourism in MS will organize Local Technical Groups in Pocone, Barao de Melgaco, Bonito and Corumba (the four priority areas for the first phase). The Local Technical Groups will assist with the tourism workshops, awareness campaigns, the coordination of training activities, and the implementation of the recommendations of the master plan in their respective areas. IBAMA will contract out the preparation and publication of a bird watcher's guide.

c) Sustainable agriculture

- 3.44 The state executing units will contract out the studies on "green" certification and trademarks for the products of the Pantanal, the preparation and diffusion of technical, market development and financing manuals. Technical specialists from the State Secretariat of Agriculture and Land Matters-MT and the State Secretariat for Production and Sustainable Development will participate in the review of terms of reference, proposals and selection of consulting services. These studies are intended to support marginally profitable farmers and ranchers in the Pantanal so that they can continue low-density ranching supplemented by new income generating activities.
- 3.45 A committee comprised by IBAMA and the state executing units will contract out the pilot projects for raising capivara and rhea in captivity and the pilot management projects for feral pigs.

6. Roads and parkways

- 3.46 FEMA-MT and FEMA-P will contract the preparation of management plans for the parkways and for the Bonito-Bodequena road. Prior to the publication of bidding documents for parkways or the Bonito-Bodequena road, the Borrower must submit evidence that the corresponding environmental management plan has been concluded, approved by the appropriate authorities, and included in the bidding documents. It is necessary to ensure that the management plans are in the bidding documents to avoid the cost overruns that occur when contractors are not informed of all tasks they are supposed to carry out.
- 3.47 DVOP in MT and DERSUL in MS will prepare terms of reference for studies and final designs related to construction and will supervise the respective works. There will be independent third party supervision of construction (technical and environmental) paid for with resources of the Program (see ¶3.71). Prior to

publication of bidding documents for the first road infrastructure work to be carried out in MT and MS, the Borrower must submit evidence it has executed an agreement with DVOP and DERSUL respectively that specifies the obligations of the parties.

7. Environmentally sustainable activities in indigenous areas

- 3.48 The state executing unit of MS will contract a consulting firm or NGO to carry out the sub-program for environmentally sustainable activities in indigenous areas. A Secretariat headed by FEMA-P will coordinate and supervise all project activities. The Secretariat includes FUNAI, EMPAER, SANESUL, the State Secretariat for Production and Sustainable Development, the State Secretariat for Culture, Sport, and Leisure, the Cultural Foundation of MS, and the Indigenous Commission representing all indigenous communities included in the project. This Secretariat will provide technical and institutional review and oversight of the consulting firm.
- 3.49 Prior to field implementation of activities, the state execution units will conduct an anthropological rapid assessment in all participating indigenous communities. The study will (i) establish culturally appropriate ways to implement program activities in each community; (ii) provide culturally appropriate ways for participatory monitoring and evaluation; and (iii) establish good communication channels between the communities and the technical teams.
- 3.50 Three multidisciplinary regional teams, supervised by FEMA-P will implement the Program in MS. Each team will have a full time social anthropologist to determine culturally appropriate ways to carry out activities, as well as to evaluate the impact of program activities on the communities
- 3.51 In MT, FEMA-MT with the help of the state branch of the Indigenous Foundation (FUNAI) will execute the sub-program. The state executing unit will contract a consulting firm or NGO and FEMA-MT and FUNAI will supervise execution.
- 3.52 FEMA-P and FEMA-MT will: (i) prepare terms of reference for the consulting firm; (ii) select a consulting firm or NGO to implement project activities; (iii) conduct periodic reviews and evaluations; and (iv) prepare reports on the advance of program activities.

C. Public participation

- 3.53 The Program includes public participation in the execution of specific activities within and across all sub-programs.
- 3.54 In the Soil and Pesticide Management and Indigenous Sub-Programs, the beneficiaries develop and implement plans in a participatory manner in which all affected stakeholders must agree. In the case of Soil and Pesticide Management, the municipalities will help choose the micro-watersheds to work in, to ensure

transparency and consistency with municipal (multiple micro-watershed) priorities.

- 3.55 There is direct participation of stakeholders in the watershed management committees in the water resources administration sub-program. This sub-program includes an innovative activity involving local schools in monitoring local water quality, using portable monitoring kits. Local participation will be integral in developing management plans for protected areas and parkways. Workshops in eco-tourism will include participatory assessment of needs and training for local guides.
- 3.56 The Program structures public participation in watershed committees specifically to address third party impacts, externalities and the protection of public goods. The Program also structures civil society participation to monitor Program execution and comment on studies for the design or the second phase.
- 3.57 The MMA, state executing units, and IBAMA will provide information to the general public, organized civil society, and populations located in the areas of intervention of the Program. The information will be available on a Web page, in published materials (brochures and videos), and in annual published progress reports. The Program will establish four public information centers (in FEMA-MT, SEMA-MS, IBAMA, and the MMA). The Borrower will track all activities of the Public Participation Program and will submit quarterly reports to the Bank.
- 3.58 Two public meetings were held in September 2000 to finalize the details of the public participation. The meetings reached a consensus that civil society will use existing municipal councils to help identify ad hoc groups to follow projects of interest, and that organized civil society will select representatives for State Committees (one in MT and one in MS).
- 3.59 The State Committees will meet quarterly and will have representatives of all sectors of organized civil society, including environmental and social NGOs, the scientific community, rural producer groups, indigenous communities, and representatives of tourism and fishing interests. Their objective is to reconcile conflicts caused by the program, monitor project activities, evaluate, and make recommendations. They also make recommendations for the design of the second phase.
- 3.60 The State Committees will elect two representatives each to an Interstate Committee, which meets twice a year and includes representatives of the MMA, the state environmental agencies, IBAMA, and FUNAI.
- 3.61 Prior to first disbursement the Borrower will present evidence that the State and Interstate Committees for the Pantanal Program have been legally constituted and have been assigned attributions and responsibilities. Within three months of first disbursement, the borrower should provide evidence that the state committees have had their first meeting.

- 3.62 To support public participation, the Program provides US\$ 600,000 (US\$ 75,000 per year per state). The State Committees will decide how they wish to allocate among three activities: (i) contracting specialized consultants to review and advise on technical aspects of the Program's projects and studies; (ii) funding meetings that bring together participants from various parts of the states; and (iii) training of members to allow them to participate more effectively in Program evaluation. To use these funds, the State Committees will provide the terms of reference and a budget to the state executing unit which will contract the services using Bank procedures. A representative of the State Committees will participate in the procurement process to ensure transparency. The state executing units will follow the normal procedures to obtain authorization to pay and the executing unit of the MMA will make payments directly to the providers of services.

D. Rotating fund

- 3.63 A rotating fund of 5% of the total financing will be established and will operate according to the standard procedures of the Bank.

E. Bidding procedures and schedules

- 3.64 Procurement of civil works, goods and services, and hiring of consulting services will be subject to the Bidding Procedures specified in Annex B and Annex C of the Loan Contract. When the estimated value of civil works is the equivalent of five million dollars (US\$ 5,000,000) or greater, and when the estimated value of goods and services is the equivalent of three hundred fifty thousand dollars (US\$350,000) or greater, the civil works or goods and services will be subject to international competitive bidding as specified in Annex B. All consulting contracts with amounts equivalent to two hundred thousand dollars (US\$200,000) will be subject to international competitive bidding. Consulting services will be contracted in accordance with Annex C of the contract. The procurement plan is attached in Annex III-1.

F. Disbursement schedule

- 3.65 The table below presents the disbursement schedule for the four year Program.

Disbursement Schedule
(US\$ millions)

Year	IDB	Local	Total	%
I	5.77	2.48	8.25	5
II	16.65	8.10	24.75	15
III	33.00	33.00	66.00	40
IV	27.08	38.92	66.00	40
Total	82.50	82.50	165.00	100
%	50	50	100	

G. Social and environmental impact

- 3.66 In its review of the Profile II of the Program, the CESI found that the Program was not likely to have major negative environmental or social impacts and did not require an Environmental Impact Assessment (EIA). It did ask for a general environmental and social analysis of the Program in the form of an ESIR.
- 3.67 An EIA/RIMA was performed for the proposed Transpantaneira parkway MT-060, because of its potential negative environmental impacts. The EIA was made available to the public on March 20, 2000. A public hearing was announced on June 14, 2000, and held on August 9, 2000. The draft ESIR in Portuguese covering the entire program was made available to the MMA for distribution on August 14, 2000. The CESI reviewed and approved the ESIR on September 29, 2000.
- 3.68 The Program is designed to reduce negative environmental impacts on the Pantanal and to improve economic opportunities. Significant positive environmental impacts will result as projects to control erosion, sedimentation and water pollution, and projects that protect ecosystems, and improve fisheries and wildlife management go into operation. Significant positive social impacts will occur as the Program creates new jobs, improves profitability of farms and ranches, improves sanitation, and provides income and better conditions in indigenous communities.
- 3.69 Direct adverse environmental impacts from the Program will be temporary and minimal. Impacts include short-term erosion, sedimentation, and dust from the construction. The impacts are easily mitigated using known construction control techniques and by proper siting of borrow pits and loading facilities. Each project will have an environmental control plan based on best practices in existing construction guides. These practices comply with requirements of the environmental licenses and the mitigation measures identified in the EIAs and RIMAs (where applicable). Bidding documents will specify performance standards, and these standards will be included in construction contracts. State or local environmental agencies will review infrastructure projects and issue environmental licenses. The operating regulations for the projects in the soil and pesticide management sub-program include environmental criteria. Estimated costs for mitigation measures are included in the cost of each project. A third-party contractor will monitor construction to ensure compliance with best practices and established mitigation measures as specified in the model terms of reference in the ESIR.
- 3.70 Prior to the publication of bidding documents for infrastructure projects requiring environmental licenses, the Borrower must submit evidence that the environmental review and license process has been completed. Prior to awarding contracts to finance any infrastructure work, the Borrower will submit evidence

that it has contracted a firm to do third-party technical and environmental supervision of construction in accordance with terms of reference acceptable to the Bank.

- 3.71 Other than temporary disruptions of road traffic during construction, no significant negative social impacts are expected. The Program has had active community participation throughout its preparation and will incorporate on-going community consultation during implementation.
- 3.72 Long-term adverse environmental impacts are possible because of increased ecotourism in the area. However, these impacts are even more likely without the Program. The potential negative impacts include: proliferation of hotels and private tourism infrastructure that are environmentally, culturally or aesthetically inadequate; numbers of tourists in excess of carrying capacity of the resource; soil and water pollution from inadequate wastewater treatment at tourism facilities; disturbance of bird nesting sites; increased fishing threatening fish populations; impacts on indigenous cultures and traditional lifestyles; erosion and wildlife disturbance from increased navigation on rivers; and increased prostitution. The Program will help develop ecotourism at an appropriate scale with appropriate safeguards (municipal norms, procedures, and training). Management plans for protected areas and parkways will determine environmental activities carrying capacities and establish limits on numbers of visitors. Implementation of management plans for parkways will ensure that zoning and land use restrictions control possible adverse impacts from development along parkways. For a road that is not a parkway but is in a sensitive area (the Bonito-Bodequena road), the project includes land use plans, restrictions, standards for new construction, and a regional environmental management plan. This land use plan will be implemented prior to improving to the highway.
- 3.73 The Program will stimulate community awareness of the importance of sustainable development in the Pantanal and will contribute to controlling unacceptable development activities (through watershed planning activities, local land use policies, the environmental review and licensing process, etc.)
- 3.74 The Program is designed to have positive gender impacts. Gender considerations have been included in three sub-programs. In the soil and pesticide management there will be meetings to brief women on actions to be taken to get their participation and support. In urban sanitation, there will be briefings on hygiene and water conservation for women in households that get new connections. In the indigenous areas sub-program, women will receive training, consistent with indigenous values, in handicraft production, marketing, and managing small-scale tourism activities. Anthropological and technical support will be available.

H. Reporting, monitoring, and supervision

- 3.75 The MMA will plan and supervise the execution of the Program using annual operating plans. These plans are based on the logical frameworks for the projects

or studies in each sub program. The activities necessary to execute each project or study will be put in a Gantt chart, and responsibility for execution of each activity will be assigned. The Gantt chart will also indicate the significant milestones in the progress of execution, and specify the timing and recipients of reports on progress and on reaching specific milestones. The detailed logical framework, Gantt chart, assignment of responsibility, and milestones will be prepared by the participating institution that has the technical responsibility for the project or study. The state executing units and IBAMA will integrate these into annual plans and the MMA will integrate the plan of each sub-executor.

- 3.76 The MMA's monitoring and evaluation specialist will develop the internal control system with input from the state executing units and IBAMA. The internal control system will monitor the implementation of projects in the annual operating plan, compliance with Program schedules, and fulfillment of financial conditions established in the loan contract. It will also monitor construction management and the compliance with environmental requirements. The MMA will maintain a data bank containing baseline data, impact indicators, and information obtained from ongoing monitoring. Within three months of first disbursement, the Borrower must present an internal project monitoring system acceptable to the Bank. Each state executing unit will be trained in monitoring and evaluation procedures and will be assisted in this function by the management firm.
- 3.77 The Annual Operating Plans, technical reports, and evaluation results (see below) will be made available to the State Committees for review and comment.
- 3.78 Within three months of Program approval, the Bank will have a "start-up" mission. The mission will review the Operating Plan for the first year, the milestones and indicators to be monitored and progress in the formation of the state civil society committees and the adoption of regulating operations. Twelve months after the loan becomes eligible for disbursement, the Bank and the MMA will review the Program. The review will focus on achieving the goals set out in the first year Operating Plan, institutional aspects including the functioning of the public participation model, and compliance with contractual conditions. Twenty-four months after eligibility, the Bank and the MMA will perform a mid-term review of the Program, concentrating in achieving the goals of the Annual Operating Plans, issues identified in the environmental monitoring program, public participation, impacts on indigenous communities and contract compliance. Thirty-six months after eligibility the Bank and the MMA will review the Program again, focusing on progress towards meeting the trigger mechanisms for presentation of the second phase to the Board. The review will also include those areas reviewed at twelve months.
- 3.79 The table that follows presents the environmental objectives, trigger indicators, and key progress indicators towards meeting the trigger indicators.

Objective	Trigger Indicator	Progress Indicator
1. By 2010, the quality of the Cuiaba and Miranda Rivers that enters the Pantanal attains Class II standards with special emphasis on dissolved oxygen and sediments, and there is substantial improvement in the Taquari River	1a. By 2004, there are registers of all users who extract water from surface and ground water sources and of all users who discharge waste into water courses. The register includes volume taken and volume and type of waste discharged into the water of the Cuiaba, Miranda and Taquari watersheds.	2001 firms contracted to develop: (a) Register of users, (b) Hydrologic balances 2003 register completed 2004 hydrologic balance completed
	1b. By 2004, the States of MT and MS have sent bills to all users who extract or discharge water in the Cuiaba, Miranda and Taquari watersheds for the right to use water and have defined the charging scheme for volume of water extracted or waste discharged.	2001 firm contracted to develop system to charge for water. 2002 watershed committees trained and equipped. 2002 water law passed in MS 2003 study of water charges submitted.
2. By 2010, the stocks of the 10 principal species of commercial fish are stable or increasing.	2. By 2004, new fish legislation (or regulations) on catch limits, fishing seasons, and number of licenses based on Program research has been approved and is being enforced and that the system of fishery statistics has provided at least one full year of data on capture effort with which to monitor the recovery of commercial.	2001 firm contracted to do biological research. 2001 firm contracted to develop system for fish statistics. 2003 preliminary biological research complete. 2003 firm contracted to incorporate research results into draft law. 2003 public meetings held on proposed changes in fishing laws. 2003 environmental personnel trained to manage the statistical system.
3. By 2010, the amount of the Upper Paraguay Watershed under designated protection increases to 2,000,000 hectares (5% of the land area) from 546,200 ha in 1999.	3. By 2004, 20% of the land in state parks and an additional 20% of land in federal parks of the Program are owned by the respective governments or have land use controls consistent with the management plans of the parks.	2001 NGO contracted to foster the creation of private reserves. 2002 state and federal governments have acquired 5% of the park land. 2002 new private reserves created inside parks. 2003 governments have acquired 10% of park land.
4. By 2010, aquaculture in the Upper Paraguay Basin increases to 13,275 metric tons from 8,850 metric tons in 1999 and tourism increases 50% from the baseline established in 2001.	4a. By 2004 there is a 20% increase in the number of private aquaculture ventures and a 30% increase in the surface area of fish ponds	2001 gene and pathogen research begun. 2002 firm contracted to prepare training courses in aquaculture. 2003 400 persons trained in aquaculture. 2003 gene bank in operation
	4b. By 2004, guides in the Pantanal are licensed and trained and campgrounds, fishing lodges, and fazendas with guest lodgings in the Pantanal have environmental licenses and are inspected at random annually and that the results of the inspection are reported as well as the sanctions applied for non-compliance.	2002 firm contracted to develop tourism plan. 2003 tourism workshops held in the affected communities. 2003 register of tourist facilities, training needs assessment, and best practice guides complete. 2004 guide training program complete.
5. The public is informed, participate and supports environmental protection measures	5. All studies for projects for the second phase are presented to civil society members of the State Committees for consideration by state authorities and the future project team.	2001 State and Interstate Committees formed and meet. 2002 Web site and public information centers in operation. 2003 Minutes of state committees acknowledge receipt of project studies and indicate observations.
6. Program efforts are financially sustainable.	6. Accounting statement show that financial mechanisms are generating the required cash flows for maintaining rural roads and operating and replacing fire fighting equipment.	2002 Financial support agreements signed with municipalities that will receive new fire stations. 2002 participating watersheds sign commitments to pay part of road maintenance costs.

I. Program evaluation

3.80 Using Program resources, the MMA will contract a firm to do the independent evaluation following the terms of reference agreed upon with the Bank. The firm

will set up a system to monitor the progress and target indicators and will, in addition, establish the baseline for the six long term objectives listed in the table⁵. The evaluation will also establish the baseline for institutional goals of the Program and the mechanisms for coordinating the information gathered from the individual monitoring and studies carried out in each sub-program. An evaluation of Program impact will be performed at the end of the first phase, based on the established baseline. Independent evaluators will also evaluate the adequacy of the institutional and public participation models and suggest improvements for the second phase. The information presented by the consultants will be reviewed by the State and Inter-State Committees and the Bank. Evaluations will be made available to the public.

J. Financial statements

- 3.81 The MMA will prepare the program's financial statements in accordance with the Bank's requirements. The sub-executing units and participating institutions must comply with these requirements identifying all the expenses incurred and payments made in accordance with the investment categories.
- 3.82 The program's financial statements will consolidate MMA's financial information with the financial information provided by all sub-executing units and participating institutions and states. The management firm will assist all institutions in the preparation of the consolidated financial statements.
- 3.83 During the execution period, the audited annual financial statements of the Program must be presented to the Bank within 120 days of the close of each fiscal period. The Secretaria Federal de Control Interno will audit the financial statements of the Program. SANESUL and the Cuiaba water company will present within 120 days of the close of each fiscal period their financial statements audited by an independent external auditor acceptable to the Bank.

⁵ The first phase of the program will not have a large impact on these values since it takes time for environmental measures to have an impact.

IV. FEASIBILITY

A. Technical feasibility

- 4.1 The Program presents a balanced mix of sub-programs that are a technically feasible response to the complex problems facing the Pantanal and that will, over the medium and long term, achieve the objectives of the operation.
- 4.2 The administration of water resources sub-program addresses the need for implementing and enforcing legislation, as well as developing information necessary for better decision-making. The terms of reference for the studies have been reviewed for technical content and consistency. The monitoring equipment, sampling point locations, parameters to be measured and frequency of measurement have also been reviewed. The Program includes a consultancy to establish baseline indicators and perform an independent evaluation that includes achieving improvements in water quality. The design and establishment of a fee system for the use of ground and surface water will use the monitoring information and registry of water users developed in the sub-program.
- 4.3 The technical interventions and the participatory method for organizing and developing integrated micro-watershed plans in the soil and pesticide management sub-program have proven effective in World Bank-supported projects in northern MT and the Parana River watershed. The Operating Regulations of the sub-program have been reviewed and are being finalized. The sub-program is geographically focused in the key sub-watersheds that are responsible for the highest sediment and pollution loads delivered to the Pantanal.
- 4.4 The protection and management of habitat, fish and wildlife sub-program consolidates existing protected areas first, and interventions are scaled so that each protected area supported in the first phase will have the infrastructure, plans and regulations necessary for continued management. The equipment needs and locations of stations for forest police and firefighters have been reviewed for technical adequacy and appropriateness.
- 4.5 The technical approach of starting with information development, through studies and pilot activities in the support for sustainable economic activities sub-program is appropriate, given the variation across the Pantanal and the need to organize and validate possible technical interventions prior to extending them across a large area. Terms of reference for the studies, pilot activities and training have been reviewed.
- 4.6 The technical and engineering designs for infrastructure included in the sanitation and parkways and roads sub-programs have been reviewed. They are technically feasible and are appropriate solutions to the specific needs identified. The Bank will review the final designs prior to bidding. Environmental licenses and

environmental supervision will be ensured prior to bidding and award of construction contracts.

- 4.7 The participatory model and appropriate design of interventions included in the environmentally sustainable activities in indigenous areas is based on lessons learned from similar programs in the Latin America region and what has proven consistent with the cultural needs of indigenous communities. The execution model and terms of reference for studies have been reviewed.

B. Institutional feasibility

- 4.8 The institutional scheme for execution adequately defines the functions and responsibilities of the various participants in the program. The execution units, at federal and state levels, are responsible for the coordination of all the activities. The executing unit in the MMA also will be responsible for the administrative, accounting and monitoring the program's investment. The state executing units will coordinate the activities of the participating institutions in each state.
- 4.9 The participating state institutions and IBAMA will be responsible for the technical supervision of the works and contractual services. These institutions will be responsible for the operation and maintenance after completion of the projects.
- 4.10 The review of the organization of the participating institutions indicates that:
- a. The EMPAERs in both states have adequate organization and regional offices distributed throughout their states that will facilitate the execution of their programs.
 - b. SANESUL, the water and sewerage company in MS, has ample experience in supervising project execution and is improving its financial situation. The financial projections indicate that SANESUL will be able to finance 25% of project costs and will have a positive cash flow.
 - c. DVOP and DERSUL have the capacity and experience to supervise road construction. Both states have established special taxes to finance Road Funds, whose resources are applied to road maintenance. MS proposes to implement road tolls.
 - d. FEMA-MT and FEMA-P need to be strengthened. FEMA-MT is contracting 25 technicians, with an annual cost of US\$ 145,000; FEMA-P is contracting 20 technicians, with an annual cost of US\$116,000. These personnel will be responsible of the supervision of the projects that these institutions have to execute.

- 4.11 The hiring of a Management firm ensures an adequate financial administration and will give uniformity the in procedures to be used by the different institutions that participate in the program.

C. Financial feasibility

- 4.12 Recognizing both the national and international importance of the Pantanal wetlands and the weak financial situation of the states, the federal government has structured this Program as a grant to the states. The states are required only to provide a small counterpart contribution, approximately US\$ 3 million per year, and pay for the operating, maintenance and replacement cost of the investments and systems financed by the program.
- 4.13 The Federal government can fund its counterpart contribution without difficulty. The States of MT and MS are in a much more difficult financial position. During 1997 and 1998, both had negative current savings and could not amortize debt from current income. Both raised cash by the concession of services, sale of assets and by borrowing. These actions generated enough resources to amortize debt and fund investment. Both states have rescheduled their debt with the Federal Government for, but neither qualifies under federal criteria to contract new long-term debt.
- 4.14 In 1999, both states improved their financial positions. MT had current savings equal to 8% of current income and a surplus in budget execution equal to 9% of current income. MS had current savings equal to 3% of current income and cut capital expenditures to attain a small operating surplus.
- 4.15 In May 2000, the Federal Government approved the Law of Fiscal Responsibility that limits expenditure on personnel to 60% of the net current income. MT is in compliance with the personnel expenditure limit and has presented projections that indicate that it will be in compliance over the next three years. MS is not in compliance, which limits the programs it can undertake. MS is reducing personnel expense and has dismissed 248 employees from the State Congress and is implementing an incentive program for retirement in the "Tribunal de Contas".
- 4.16 Despite continuing fiscal adjustment, both states will be able to provide the US\$ 3 million per year counterpart contribution. This amount is only 5% of the States' 1999 investment budget, and the 1999 investment budget was much lower than earlier years.
- 4.17 With the exception of SANESUL, the institutions that participate in the Program, do not have the capacity to generate resources for their counterpart contribution. Some of these institutions have resources that come from the collection of fines, issuance of licenses, and provision of services, but these funds only pay for operating expenses.

- 4.18 To reduce the need for state support, a number of sub-programs implement fees or institute agreements by which beneficiaries will pay for part of the cost of operation and maintenance. These include water charges, user funds for rural roads and fire departments, parkways and parks.
- 4.19 Financial projections indicate that SANESUL will have sufficient income to finance the operating cost of its system.

D. Economic feasibility

- 4.20 The Program is economically viable. projects selected are the least cost alternatives. All projects evaluated using benefit-cost analysis have rates of return over 12%. All projects covered by operating regulations will be accepted only if they have rates of return greater than 12%. The Program, will produce a variety of ecological and environmental benefits that, if quantified, would improve its economic justification.

1. Soil and pesticide management in critical sub-watersheds

- 4.21 Because individual farmers need to accept and adopt new conservation methods, the economic analysis evaluates their financial attractiveness. The analysis used farm models to evaluate the financial and economic viability of the proposed interventions. The private rates of return ranged from 11.6% to 19.4% Inclusion of off-farm, environmental benefits would increase these rates of return.
- 4.22 Rapid rates of adoption of new technology are critical to the success of the projects. Higher adoption rates are promoted by allowing farmers to choose among options, rather than by forcing them to accept predetermined packages.
- 4.23 To ensure that the interventions are economically viable, the Program will allow farmers to choose among activities to be financed by the Program and will require a financial analysis of the individual farm management plan that demonstrates a rate of return of at least 12%.
- 4.24 The soil and pesticide management sub-program will provide a subsidy of up to \$ 3,000 per farmer. This subsidy is justified by the off-farm, environmental benefits that the projects generate but the farmers do not receive. The Program will finance 100 percent of recovery and fencing of riparian gallery forests, since all the benefits accrue in lower parts of the watershed, and all the cost of taking land out of production is borne by the landowner. The \$3,000 limit on support per farmer is implicitly related to the income level of farmers. Three thousand dollars covers the average investment cost for the small family farmers and the first year investment cost of medium scale agricultural producers. It provides nominal support for larger ranchers (up to 500 ha) to help them adopt low cost practices over extensive areas. The \$3,000 limit per farmer is consistent with similar soil conservation programs financed by the multilateral investment banks. It has been evaluated and adopted in World Bank-supported projects. The \$ 72,000 limit per

watershed provides an incentive for producers to minimize the costs of activities and maximize community and individual benefits.

2. Potable water and sanitation

- 4.25 A benefit-cost analysis was done for each water project. Benefits from reducing physical losses are equal to the savings from not having to produce additional water (marginal cost of water in each system). Benefits for increasing water supply are equal to the consumer surplus estimated with the Bank's SIMOP model. The results indicate that the projects in all cities are economically viable. Internal rates of return range from 17.4% to 63.7%.
- 4.26 The analysis examined the sensitivity of the rate of return to adverse changes in: (i) incremental capacity; (ii) investment and operating costs; (iii) water tariff; and (iv) elasticity of demand for water. Each parameter was varied +/- 30%. The rates of return did not fall below 12% for any of the adverse variations.
- 4.27 There was also a benefit-cost analysis for expansion of the sewage collection network. Sewage treatment investments were analyzed in order to ensure that they were the least cost alternative for the proposed solution. The analysis used benefit functions based on contingent valuation studies to estimate the benefits of investments in sewage collection networks.
- 4.28 The willingness to pay estimates obtained ranged from R\$9.57 to R\$13.93. These values represent 2.9% to 3.6% of household income. Using these estimates, all projects have a rate of return greater than 12% (range from 12.8% to 28.0%). The sensitivity analysis indicated that only Miranda and Bodoquena are sensitive to cost estimates. This sensitivity analysis indicates that the results are not affected by reasonable changes in the benefit function.

3. Parkways and roads

- 4.29 The proposed parkways and roads were evaluated using benefit-cost analysis. The benefits (estimated with the HDM Model) are the difference between vehicle operating costs with and without the project. Environmental and tourism related benefits were not included in the analysis.
- 4.30 The results indicate that projects proposed for the first phase are economically viable (MT-040, Santo Antônio-Barão de Melgaço, MT-250, Chapada dos Guimaraes-Mirante, MS-450, Palmeira-Piraputanga, and MS-178, Bonito-Bodoquena). Internal rates of return ranged from 12.1% to 41.2%. Only the Chapada dos Guimaraes-Mirante, is sensitive to variations in costs and benefits. It is expected that this parkway will generate substantial tourism-related benefits that were not included in the analysis.

E. Environmental feasibility

- 4.31 The Program is designed to reduce negative environmental impacts on the Pantanal and to improve economic opportunities. Significant, positive environmental impacts are expected: improvement in water quality, habitat, fisheries and wildlife, and reduction of erosion, sedimentation, agrochemical, organic, and sewage contamination and flooding. Social impact will also be positive: creation of new jobs, improvement of profitability of farming and ranching, improved sanitation, and economic opportunities for indigenous communities.
- 4.32 Because the Program has been designed to solve environmental problems and avoid the increase of future ecological damage, potential adverse impacts are expected to be minimal. Estimated cost for these measures are included in the cost of each project and performance standards will be incorporated into the bidding documents and construction contracts. A third-party contractor will monitor construction to ensure compliance with best practices and established mitigating measures in accordance with agreed terms of reference.

F. Benefits and beneficiaries

- 4.33 The Program will produce benefits over the long term. Expected social benefits include improved quality of life from the provision of basic water and sanitation services. Health risks will be reduced directly by decreasing the level of agrototoxic chemicals in the water. Early warning will reduce the risk of loss or damage from floods. An indirect social benefit over the long term will be the presence of a watershed authority that ensures rational use of water resources, protection of groundwater and resolution of conflicts. Economic benefits include increased income for producers in the upper basin and in the Pantanal floodplain, reduced road user costs and increased tourism benefits. Indirect benefits will occur, especially over the long term, including increased income and employment generated from a more diversified economic base.
- 4.34 The Program includes actions to assist indigenous communities and ensure positive social impacts for these populations. Specific measures have been incorporated to provide economic development opportunities and value their cultures. Individualized plans will be developed through a participatory diagnostic evaluation, to ensure full consideration of cultural and gender aspects and the self-identification of needs for incorporation into the mix of activities.
- 4.35 It is possible to identify direct beneficiaries for the soil and pesticide management and the urban sanitation sub-programs. The soil and pesticide management sub-program will directly benefit 11,800 producers in MS and 7,800 in MT. Forty eight percent of the beneficiary households in MT are low income (less than 3 minimum salaries). No data were available to calculate the percentage of beneficiary households in MS that are low income. In addition, the sanitation sub-program will benefit 304,805 people in the 10 municipalities where water and

sewage investments will be made. The majority (72% to 89%) of beneficiaries of the proposed water and sewage projects are low income. The indigenous action plan will benefit 22,900 indigenous people in the two states. There are a number of direct beneficiaries from investments in parkways, was not estimated.

G. Risks

- 4.36 There are a number of risks associated with this Program. The executor and the sub-executors have little experience with this type of Program. The state institutions are weak and there have been significant delays in the execution of World Bank projects. The Program addresses these risks by financing the hiring of a firm specialized in financial administration to assist the executors and participating institutions. In addition, the Program includes training for the staff of the executing units. The Bank will support the institutions with a "start-up", mission, a review mission at the end of the first year of execution, and after 36 months of execution.
- 4.37 The states are in weak financial condition. They have improved their budget indicators by selling assets and making significant cuts in their operating and capital budgets. These cuts cannot continue and, in fact, the Program implies increased operating and maintenance costs. The Program addresses this risk by emphasizing the consolidation of existing activities (parks, forest police, firemen) in the first stage in order not to increase personnel costs significantly. It leaves expansions for the second phase. In addition, the Program emphasizes financial mechanisms that have beneficiaries contribute to the cost of operation and maintenance (water use charges, tolls for road use, use fees for parks, beneficiary contributions for rural road maintenance and operating cost of fire departments). The Program provides an incentive for the States to budget funds for adequate maintenance by making continuation to the second phase dependent on success in the first phase.
- 4.38 A third risk is possibility that in a complex program, the executors can lose focus on priorities. The Program addresses this risk contractually by requiring that environmental activities be started before infrastructure works can be put out to bid. In addition, the first year review will keep the Program on target. Finally, both civil society and an independent evaluation firm will be monitoring the results and progress towards the key achievement indicators.
- 4.39 A fourth risk is that the mechanisms set up to foster public participation may not work effectively. There already have been disputes among groups that want to be represented on committees. Members may not have the sustained interest to work out and agree on the operating rules. The Governments may ignore recommendations. To manage these risks, the Bank hired consultants to help civil society organize public meetings that established a preliminary structure for participation. The Program design includes information systems available to the public and provides US\$600,000 to support civil society participants. The Bank will follow the participation process closely. It has already offered the help of

facilitators to assist the organization process. It will send a mission to evaluate progress in the establishing of the Operating regulations three months after the approval of the operation. It will monitor the information provided to civil society to make sure it is complete. Each program review will explicitly evaluate the problems and successes with the participation process.

Annex II-1

SUMMARY OF THE SUB-PROGRAMS

LOGICAL FRAMEWORK

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
PURPOSE The environmental quality of the Pantanal's ecosystems stabilizes.	1. By the year 2010, the quality of water of the Cuiaba and Miranda Rivers that enters the Pantanal attains Class II quality standard with special emphasis on dissolved oxygen and sediments and the quality of the Taquari River improves substantially.	Data from the water quality monitoring system installed in MT and MS. Data available on the internet.	
	2. By the year 2010, the populations of the 10 principal commercial fish species are equal or greater than the 2001 baseline established by Program Research.	Fish population data from the sampling system established by the Program.	
	3. By the year 2010, the area of the Upper Paraguay watershed under designated protection should have increased to 2,000,000 ha (5% of the land area) from 546,206 ha (1% of land area) in 1999.	Data on designated protected areas in IBAMA.	
	4. By 2010, aquaculture production in the the Upper Paraguay basin has increased 50% to 13,275 metric tons from 8,850 metric tons in 1999.	Fishery statistics of IBAMA and EMPRAPA	
	5. By 2010, the number of visitors to the Pantanal should have increased by 50% over the number registered in the baseline indicators to be collected in 2001.	Baseline data of tourism study and the statistical system financed by the Program.	
SUB-PROGRAMS			
1. ADM. OF WATER RESOURCES: The states of MT and MS	1a. There is a register of all users who extract water or dispose of	The registers available in FEMA-MS and FEMA-P.	Data is used to control effluent discharges into water bodies and to set

maintain the quality of water and maintain a minimum flow.	waste, volume taken and types of waste disposed of for the Cuiaba, Miranda and Taquari watershed and all ground water.		up use fees to maintain the system.
	1b. MS approves a water resource law similar to that of MT that permits a charge for the right to use water and the volume of use	The approved law.	The program is expanded to the next priority watershed in the second phase.
2. SOIL AND PEST-ICIDE MGMT. Farmers and miners use techniques that reduce erosion and the release of toxic substances into watercourses.	2a. Farmers have implemented the measures partially financed by the program and are maintaining forest galleries properly.	Survey confirmation by the independent evaluation firm and aerial photography	The system is expanded in the second phase to further reduce sediment entry.
	2b. In MT, 75% of landowners in critical micro-watersheds have environmental licenses and recovery plans.	Register of landowners and licenses available in FEMA-MT.	MT has the political will and resources to continue to enforce the law.
	2c. Degraded mining areas in the Rio Poxoreo and Rio Coite have vegetation cover.	Aerial photography before and after	
3. PROTECTION OF HABITAT, FISH AND WILDLIFE. Representative areas of the Pantanal's ecosystems are preserved, and sensitive area patrolled to prevent illegal fires, over-fishing, and poaching.	3a. By 2004, twenty per cent of the land in the state parks is owned by the state (or has demonstrated land use controls) and an additional 20% of the land in federal protected areas is owned by the government (or has demonstrated land use controls).	3a. Land titles, private reserve contracts, or other demonstration	
	3b. The number of visitors to park increases from 100,000 in 1999 to 200,000 in 2004 and the entry fees at parks in the Program increase from R\$ 3 to R\$ 7 by 2004.	Visitor and park revenue statistics provide by IBAMA for federal protected areas and by FEMA-MT and FEMA-MS.	Parks and visitor facilities are adequately funded and maintained
	3c. By 2004, new fish legislation, based on Program research, has been passed and is being enforced.	The legislation or regulations. Statistics of FEMA-MT and the Forest Police on MS on infractions sanctioned.	
	3d. Forest police have the agreed number of	Report of the independent evaluators	The government continues to provide

	officers assigned and the equipment fleet is at the agreed level and properly maintained		adequate funds to operate, maintain and replace equipment.
	3e. The firefighters have the agreed number of officers assigned and the equipment fleet is at the agreed level and properly maintained	Report of the independent evaluators	The system of municipal agreements provides revenues to pay specified operating costs and the government continues to provide adequate funds to operate, maintain and replace equipment
4. URBAN SANITATION. The amount of organic and chemical contamination draining into the tributaries of the Pantanal decreases.	4. In MS, the BOD loads from human sources that enter the tributaries of the Pantanal decrease from 5 metric tons per day in 1999 to 4 metric tons in 2004.	End of pipe monitoring system	The sanitation companies recover their financial health and are able to expand the sewerage and treatment systems.
5. SUPPORT FOR SUSTAINABLE ACTIVITIES. Residents of the Pantanal engage in economic activities that use environmental capital in ways that preserve and improve the environment.	5a. Fish production from aquaculture in MT increases 30% from 7,200 tons in 1999 to 9,360 tons in 2004 and in MS it increases 30% from 1,650 tons to 2,145 tons.	EMPAER and IBAMA. Boletim Estatístico da Pesca.	Fish from aquaculture are an adequate substitute for fish extracted by commercial producers.
	5b. All campgrounds, fishing lodges, and fazendas with guest facilities are licensed and checked randomly at least annually, all guides for the Pantanal trained and licensed.	Registers of FEMA-MT and FEMA-MS	FEMA-MT and FEMA-MS have adequate financial resource to monitor compliance of facilities.
6. PARKWAYS AND ROADS. Tourists, firefighters, and ranchers have all year access routes to strategic areas in the Upper Paraguay Basin.	6a. Roads are transitable in rainy season and average travel time is reduced.	Reports of the independent evaluation that include baseline measurement of travel times	
	6b. Parkway management staffs are trained and in place, road and facility maintenance is being performed, visitor centers are operational and offer environmental education as well as guidance to visitors.	Independent third party verification that	

<p>7. ENVIRONMENTALLY SUSTAINABLE ACTIVITIES IN INDIGENOUS AREAS. Indigenous communities adopt and implement sustainable land use activities on indigenous lands.</p>	<p>7. Indigenous communities of the Program use only organic techniques (no agrottoxics) and are maintaining gallery forests financed by the Program.</p>	<p>Report of the special evaluation for indigenous areas</p>	<p>Organic techniques are sufficiently productive to justify their continuation.</p>
<p>8. OTHER IMPORTANT RESULTS</p>	<p>8a. All studies for the second phase have been submitted to the civil society members of State Committees and all comments are presented in writing to the Inter-State Committee and the Bank.</p>	<p>A memo of no objection or comments for each study financed by the Program on file in the MMA</p>	
	<p>8b. Cost recovery mechanisms for rural roads, municipal fire stations are yielding an annual cash flow that partially covers 50% of maintenance and replacement costs and park fees are raised to the price of the average movie ticket.</p>	<p>Accounting statement of funds and entrance fee schedules of parks.</p>	

Annex III-1 Procurement Plan

Description and Cost	Source of Finance		Bidding Method	Pre qualification	Publication	
	IADB	LOCAL			Semester/Year	Development Business
1. Administration						
SERVICES						
Management Firm \$5,700	100%		IPB	YES	I/01	YES
STUDIES						
Baseline Evaluation \$950	100%		IPB	YES	I/01	YES
Follow-up Evaluation \$800	100%		IPB	YES	I/03	YES
2. Administration of water resources						
GOODS						
Vehicles \$616	100%		IPB	NO	I/01	YES
40 hydrometerological stations \$560	100%		IPB	YES	II/01	YES
Measuring equipment \$600	100%		IPB	YES	II/01	YES
Material and equipment \$650	100%		IPB	YES	II/01	YES
Laboratory equipment for monitoring water quality \$350	100%		IPB	YES	I/02	YES
SERVICES						
Integrated data base for Internet \$700	100%		IPB	YES	II/01	YES
Monitoring of 36 hydrometerological station and 5 conventional stations \$ 1.089,30	100%		IPB	YES	II/01	YES
Training and awareness campaignis for water users. \$350	100%		IPB	YES	II/01	YES
Laboratory designs \$398	100%		IPB	YES	I/01	YES
Design and implementation of the state water resource management plan \$810.8	100%		IPB	YES	II/01	YES
Preparation of the hydrogeological map of the Upper Paraguay Basin (20.000 KM2) in the scale of 1:25.000 and 1:100.000 (8 folhas); develop the hydrologic balance for defined aquifers, and do test pumping. \$890	100%		IPB	YES	II/01	YES
3. Soil and pesticide management						
GOODS						
Vehicles. \$529	100%		IPB	YES	II/01, I/02 e II/02	YES
Adquisição de equipamentos técnicos pra as ações nos sub-bacias do Taquari (planalto e planície) e Miranda. \$980.4	100%		IPB	YES	II/01, I/02 e II/02	YES
Studies of erosion in the Taquari watershed. \$411	100%		IPB	YES	I/01	YES
SERVICES						
Restroration of gallery forests. \$2,632	100%		IPB	YES	II/01, I/02 e II/02	YES
ATER SERVICES \$1,077	100%		IPB	YES	I/02, I/03 e I/04	YES
4. Preservation of Habitat						
GOODS						
Boats \$350	100%		IPB	YES	II/01	YES
Vehicles \$945	100%		IPB	YES	II/01	YES
Fire trucks and Vehicles \$794	100%		IPB	YES	I/02	YES
SERVICES						
Digital Mapping at scale 1:250000 in the Pantanal \$700	100%		IPB	YES	I/02	YES

Description and Cost		Source of Finance		Bidding Method	Pre qualification	Publication	
		IADB	LOCAL			Semester/Year	Development Business
5. Urban sanitation SERVICES							
Collectors for sewerage \$ 7,216	Bodoquena		100%	IPB	YES	I/01	YES
	Bonito						
	Corumbá						
	Porto Murtinho						
	Rio Verde						
Sewage treatment systems and pumping stations \$6,189	Bodoquena		100%	IPB	YES	I/01	YES
	Bonito						
	Corumbá						
	Porto Murtinho						
	Rio Verde						
Community Mobilization \$1,152	Bodoquena		100%	IPB	YES	I/01	YES
	Bonito						
	Corumbá						
	Porto Murtinho						
	Rio Verde						
Installation of sewerage collection systems \$2,704	Coxim		100%	NPB	YES	I/02	NO
	Ladário						
Installation of sewage treatement plants and pumping stations \$1,788	Coxim		100%	NPB	YES	I/02	NO
	Ladário						
Community mobilization \$594	Coxim		100%	IPB	YES	I/02	YES
	Ladário						
	Aquidauana						
Implantação de Sistema de Esgotamento Sanitário (Coleta, Transporte e Tratamento) \$2,498,242.92	Aquidauana		100%	NPB	YES	I/02	NO
Installation of sanitary sewerage systems \$959	Miranda		100%	NPB	YES	I/03	NO
Community mobilization \$38	Miranda		100%	IPB	YES	I/03	YES
GOODS							
Pipes and connections \$2,388	Bodoquena		100%	IPB	YES	I/01	YES
	Bonito						
	Corumbá						
	Porto Murtinho						
	Rio Verde						
Equipment \$744	Bodoquena		100%	IPB	YES	I/01	YES
	Bonito						
	Corumbá						
	Porto Murtinho						
	Rio Verde						
Pipes and connections \$1,062	Coxim		100%	IPB	YES	I/02	YES
	Ladário						
	Aquidauana						
Equipment \$253	Coxim		100%	NPB	YES	I/02	NO
	Ladário						
	Aquidauana						
Pipes and connections \$104	Miranda		100%	NPB	YES	I/03	NO
Equipment \$49	Miranda		100%	NPB	YES	I/03	NO

Description and Cost	Source of Finance		Bidding Method	Pre qualification	Publication	
	IADB	LOCAL			Semester/Year	Development Business
CONSULTING SERVICES						
Preparation of bidding documents to hire a private operator \$300	100%		IPB	YES	II/01	YES
Management contract for Cuiaba's water system \$2,000	100%		IPB	YES	II/02	YES
6. Support for sustainable activities						
CONSULTING SERVICES						
Master plan for tourism development \$900	100%		IPB	YES	I/02	YES
7. Parkway and tourist roads						
WORKS						
Pave MT-040/361 \$ 16,606	100%		IPB	YES	I/02	YES
Pave MT-361, BR-364 Porto de Fora. \$5,287	100%		IPB	YES	I/02	YES
Bridges and access for MT-060 IBAMA-Porto Jofre. \$6,200	100%		IPB	YES	I/02	YES
Construção de WORKS de Arte Especiais MT-060, IBAMA-Porto Jofre \$9,609.4	100%		IPB	YES	I/02	YES
Pave MS-178 Bonito-Bodoquena. \$10,465	100%		IPB	YES	II/01	YES
Pave MS-450 Palmeiras/Piraputanga/Cera \$2,573	100%		IPB	YES	II/01	YES
GOODS						
Road maintenance equipment. \$1,582	100%		IPB	YES	I/02	YES
Equipment. \$307	100%		IPB	YES	I/02	YES
SERVICES						
Management and supervision MT-060 IBAMA-Porto Jofre. \$770	100%		IPB	YES	I/02	YES
Management and supervision of MT-040/361. \$776	100%		IPB	YES	I/02	YES
Implementation of environmental management plan MT-060, IBAMA-Porto Jofre. \$791	100%		IPB	YES	I/02	YES
Technical and environmental supervision of MS-178. \$902	100%		IPB	YES	II/01	YES
Technical and environmental supervision of MS-450. \$818	100%		IPB	YES	II/01	YES
CONSULTING SERVICES						
Engineering designs for MT-060, IBAMA-Porto Jofre. \$428	100%		IPB	YES	I/01	YES
Design for works of art MT-060-IBAMA-Porto Jofre. \$890.36	100%		IPB	YES	I/01	YES
Engineering designs for MS-184/228- Pantaneira Parkway. \$948	100%		IPB	YES	II/01	YES

PROPOSED RESOLUTION

BRAZIL. LOAN /OC-BR TO THE FEDERATIVE REPUBLIC OF BRAZIL
(Pantanal's Sustainable Development Program)

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 Federative Republic of Brazil, as Borrower, for the purpose of granting it a financing to cooperate in the execution of Pantanal's Sustainable Development Program. Such financing will be for the amount of up to eighty-two million five hundred thousand dollars of the United States of America (US\$82,500,000), or its equivalent in other currencies, except that of the Federative Republic of Brazil, which are part of the Ordinary Capital resources of the Bank, and will be subject to the "Special Contractual Conditions" and the "Financial Terms and Conditions" of the Executive Summary of the Loan Proposal.