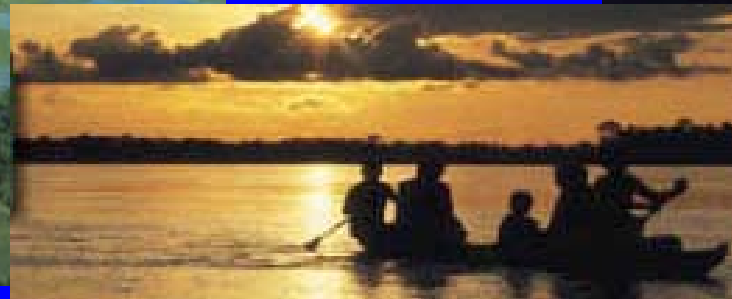
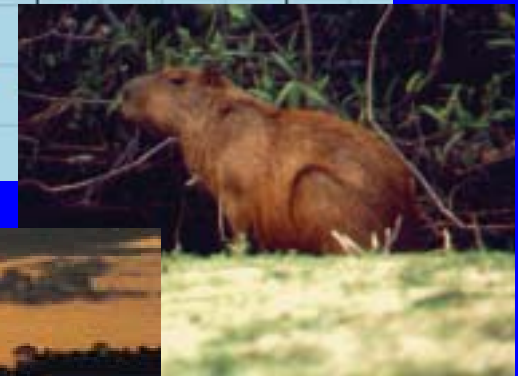
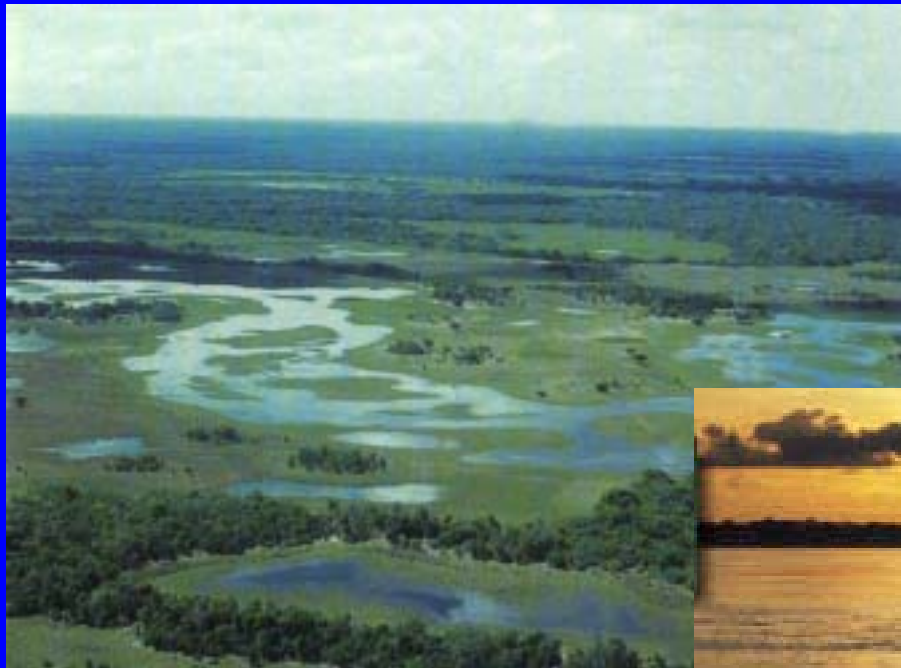


The Pantanal ----

People, Places, Priorities

Can integrated water management serve society and ecosystems?



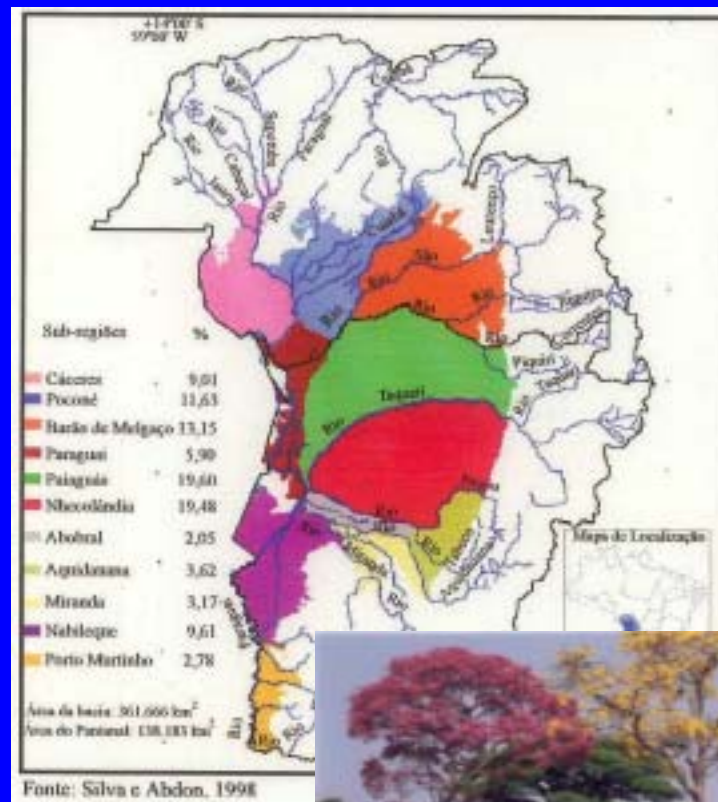
The Pantanal Program (2001-2009)

U\$400 Million IDB project to:

a) restore ecosystem quality

b) promote sustainable
development

Will this program 'work'?



Integrated water management for integrated systems

1) Analysis Methods

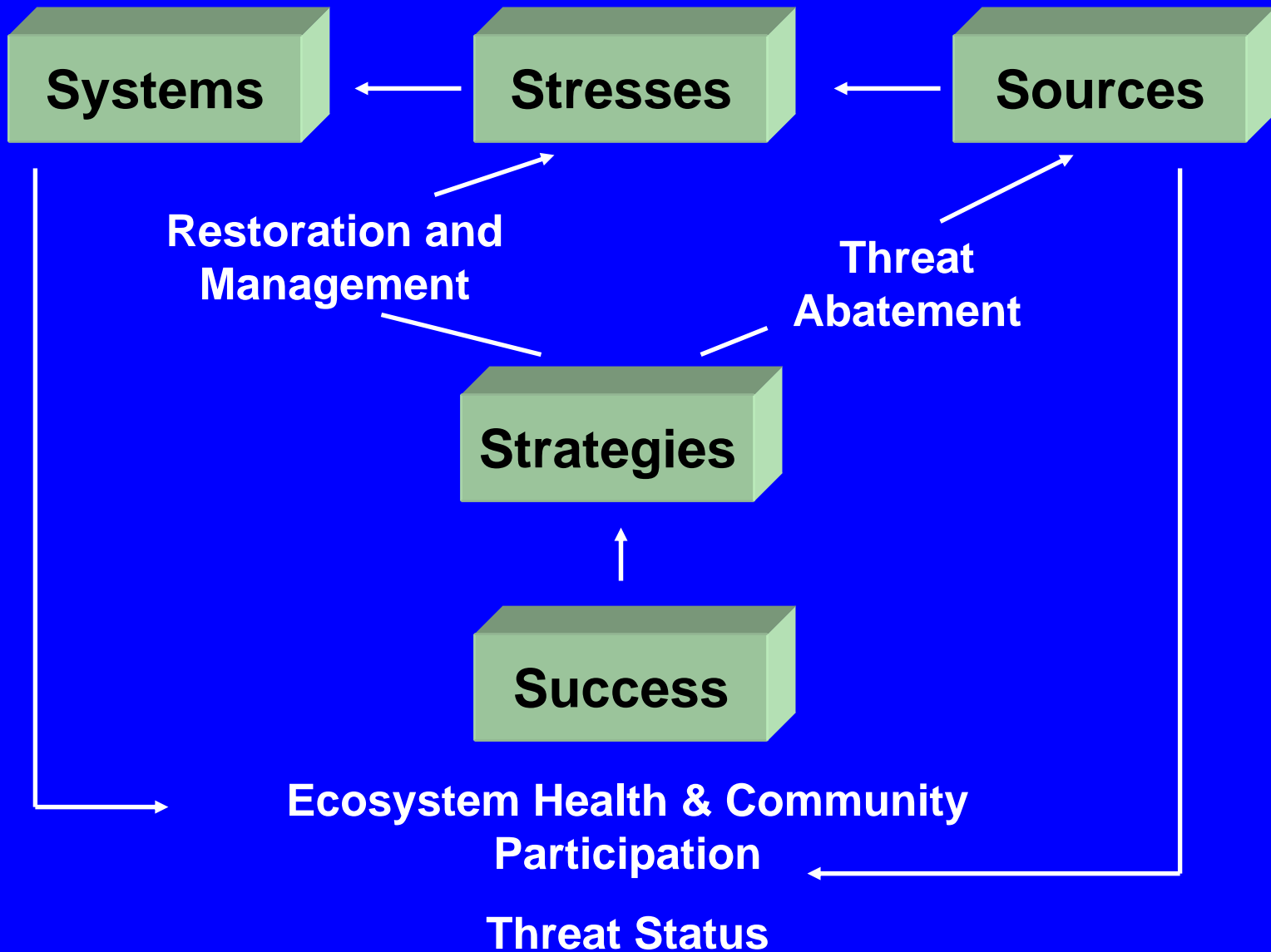
2) Identified Threats

3) Critique of Pantanal Program

4) Suggested Improvements



5-S Analysis Logic Diagram



Threats



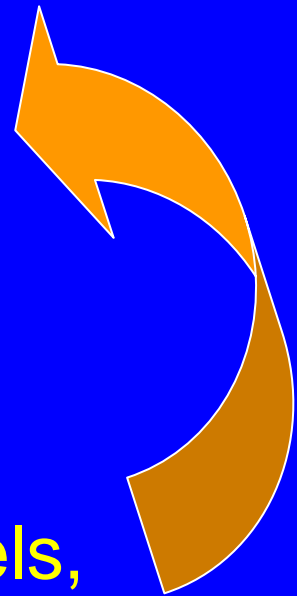
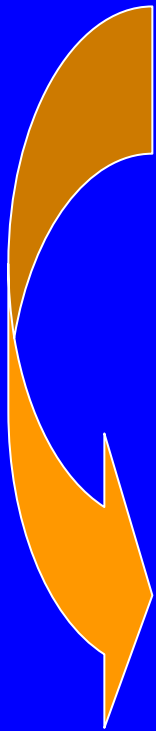
Changes in the land use:

- Deforestation (plateau): burning, monoculture, grazing
- Erosion / sedimentation

Changes in the water quality:

- agrochemicals - pesticides / fertilizers, mining -Hg, sewage, garbage, oils, fuels, suspended sediments,

Loss of biodiversity



Threats



Modifications of natural hydrological cycle

- roads, local dam and dike construction
- Waterway (dredging/ rectification / widening)
- changes in the flood pulse

Changes in the biogeochemical cycles

Loss of biodiversity

Threats



- Changes in the socio-economic system
- unemployment
- exploitation of fauna by poaching and overfishing,
- changes in habitats
- urbanization
- changes in the local culture



An aerial photograph of a vast, flat, green landscape, likely a wetland or marsh area. The terrain is covered in dense green vegetation, with a prominent, winding river or stream cutting through the center. The background shows a flat horizon under a clear sky. The text "STRATEGIES for SUSTAINABILITY" is overlaid in the center of the image.

STRATEGIES for SUSTAINABILITY

Strategies for sustainability in the Pantanal and UPB

Agriculture:

- Soil conservation practices
- Organic farming including weed and pest control
- Cooperatives
- Develop “labeled” & certified products
- Appropriate crop selection
- Reduce pressure for agricultural intensification
- Land tenure system
- Land degradation

Strategies for sustainability in the Pantanal and UPB (CONT)

Industry, mining and infrastructure:

- Alternative energy sources & transportation options (roadways, navigation improvement/design)
- Carbon sinks
- Mining controls (permit program compliance ISO 14k)
- Infrastructure development must comply w/ecosystem limitations (demand mgt, “smart growth”, interdisc. eng. solutions, efficient water use infrastructure)

Strategies for sustainability in the Pantanal and UPB (CONT)

Governance

(monitoring, regulation, legal framework, accountability):

- Program enforcement (conservation, land use, industry)
- Comprehensive basin committee plan
- Promote coordination in the region (incl. BOL&PAR)
- Conflict provision, legal instruments and mechanisms
- Develop adjudication committee to resolve grievances among basin countries
- Develop central data management center
- Independent evaluation of the program
- Incentive programs

Strategies for sustainability in the Pantanal and UPB (CONT)

Public/stakeholder/participation/community:

- Education campaign
- Community
- Cooperatives
- Basin committee
- Stakeholder participation @ all levels & phases
- Education & health, social services
- Community capacity building
- Community involvement in evaluation

Analysis of Pantanal Program

- Is divided into two phases
- Has seven sub-programs
 - administration of water resources
 - soil and pesticide management in critical watershed
 - protection & management of habitat, fish & wildlife
 - sanitation
 - support for sustainable economic activities
 - parkways and roads
 - environmentally sustainable activities in indigenous areas

Analysis of Pantanal Program

- Each sub-program has multiple objectives
- Each sub-program has multiple 'specific activities
- Sub-programs receive very different proportions of the funding

Critique of Pantanal Program

- No clear definition of 'sustainable development'
- Objectives & Activities of the sub-programs
 - too many objectives
 - contradictory
 - 'specific activities' are often more vague than objectives
- Quantity of funding for programs
 - agriculture big threat (we think), but very small \$ for that sub-program

Critique of Pantanal Program

- Sustainable Economic sub-program
 - Unrealistic intention to change economic emphasis on agriculture and ranching to aquaculture. High \$'s to the Aquaculture component.
- Does not include communication structure with Bolivia and Paraguay
- Does not include a comprehensive monitoring and evaluation component

Critique of Pantanal Program

- Problems with Public Participation
 - is often treated as a separate or unique category instead of being an integral part of each sub-program
 - P.P is placed as a separate component of the budget
 - there is little evidence that the whole Pantanal Program was created with much input from local stakeholders
- The Roads and Sanitation sub-programs are receiving the majority of the money

Some Recommendations

Current

1. Water Resources Management

2. Soil Management and Agrochemicals

1. Protection of Habitats, Ictiofauna and fauna

4. Urban Sanitation

5. Sustainable Activities Support

6. Scenic Roads

7. Indigenous Areas

Proposal

Blue Agenda:
Water Resources Management

Brown Agenda:
Waste Management

Green Agenda:
Environment/Ecosystem Management

Gray Agenda:
Governance

Some Recommendations

I - Improve the Water Monitoring System for The Upper Paraguay Basin:

- Improve the Hydrologic Data Network
- Improve the Hydro-geologic Data Network
- Improve the Meteorological Data Network
- Implement Decision Support System

II - Implementation of Soil Management Best Practices in Critical Sub-basins (agricultural practices, agrochemical use and mining):

- *Develop a Strategic Plan for Critical Selected Sub-basins*
- *Implementation of the Pilot Project for Soil Conservation in Critical Selected Sub-basins*

I - Improving the Water Supply and Sewage Collect/Treatment Systems in Selected Cities

II - Implementation of Solid Waste Management Systems in Selected Cities

III - Implantation of Scenic Roads

I - Implantation and Management of the Environmental Reserves

II - Ictio-fauna Management

III - Fauna Management

IV - Implement the Management System of the Tourism and Ecotourism Activities

I - Capacity Building at the State Level (MT and MS)

- Official Organizations for Water Resources and Environment
- Fire Department

II - Mobilization and Implementation of the Upper Paraguai River Basin Committee (Law No. 9433/97)

III - Improve a Communication Network

IV - Results Dissemination