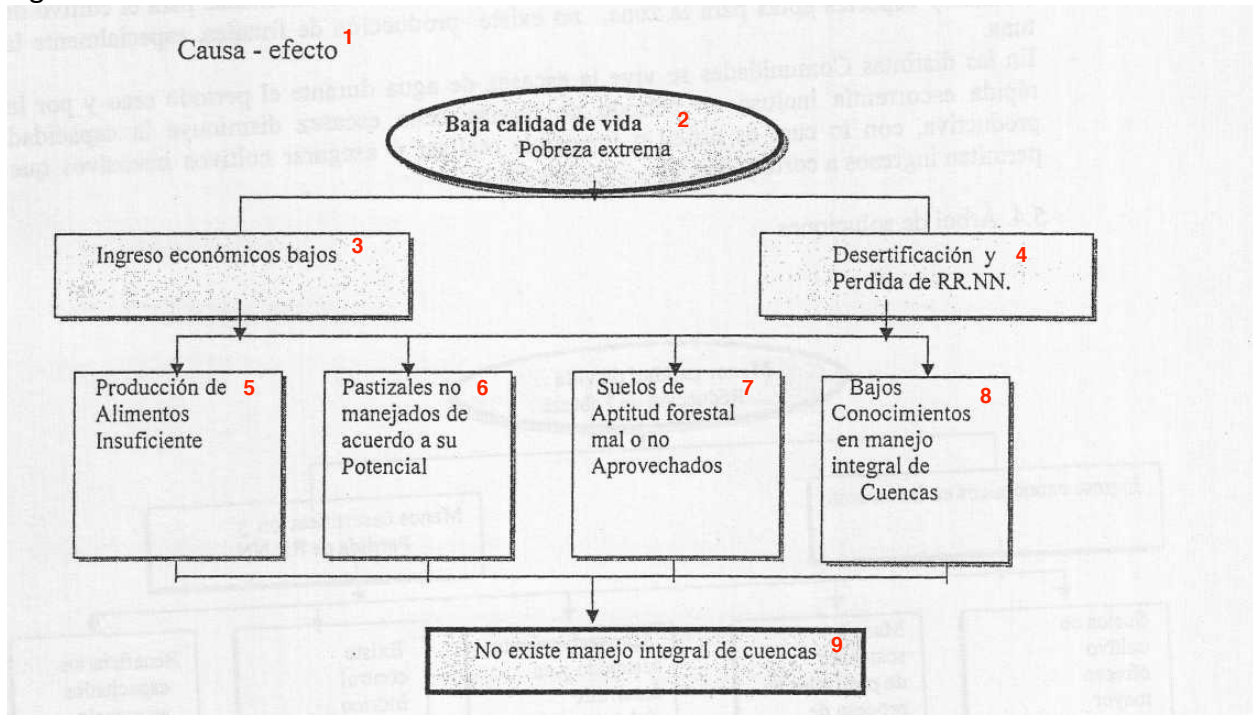


## Appendix 1. Example Boundary Objects

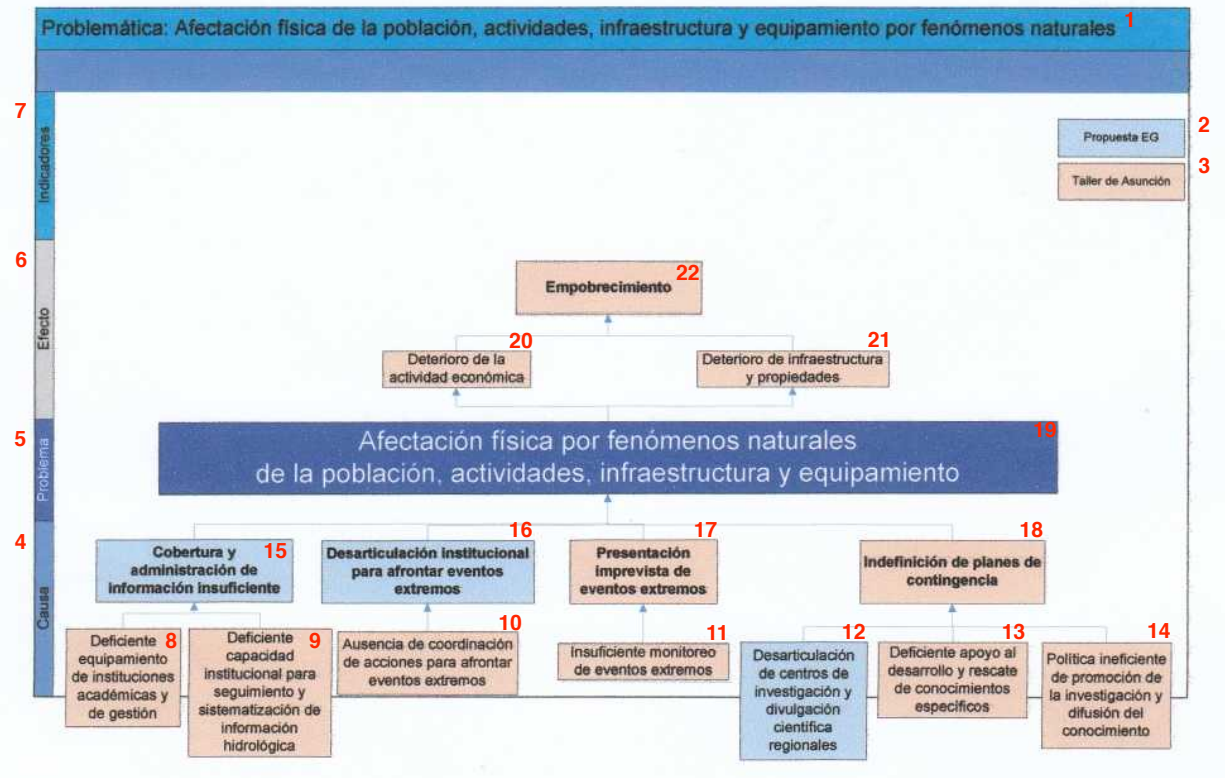
Fig. A1.1



#	Translations from Figure A1.1
1	Cause-effect
2	Low quality of life/Extreme poverty
3	Low economic incomes
4	Desertification and loss of natural resources
5	Insufficient food production
6	Pastures not managed in accordance with to their potential
7	Poorly used or unused soils suitable for forest plantations
8	Poor understanding/knowledge of Integrated Watershed Management
9	Integrated Watershed Management doesn't exist

Fig. A1.2

**GRUPO TEMÁTICO A**  
**DENOMINACIÓN: Recursos Hídricos**  
**PROBLEMÁTICA: Afectación física de la población, actividades, infraestructura y equipamiento por eventos naturales**

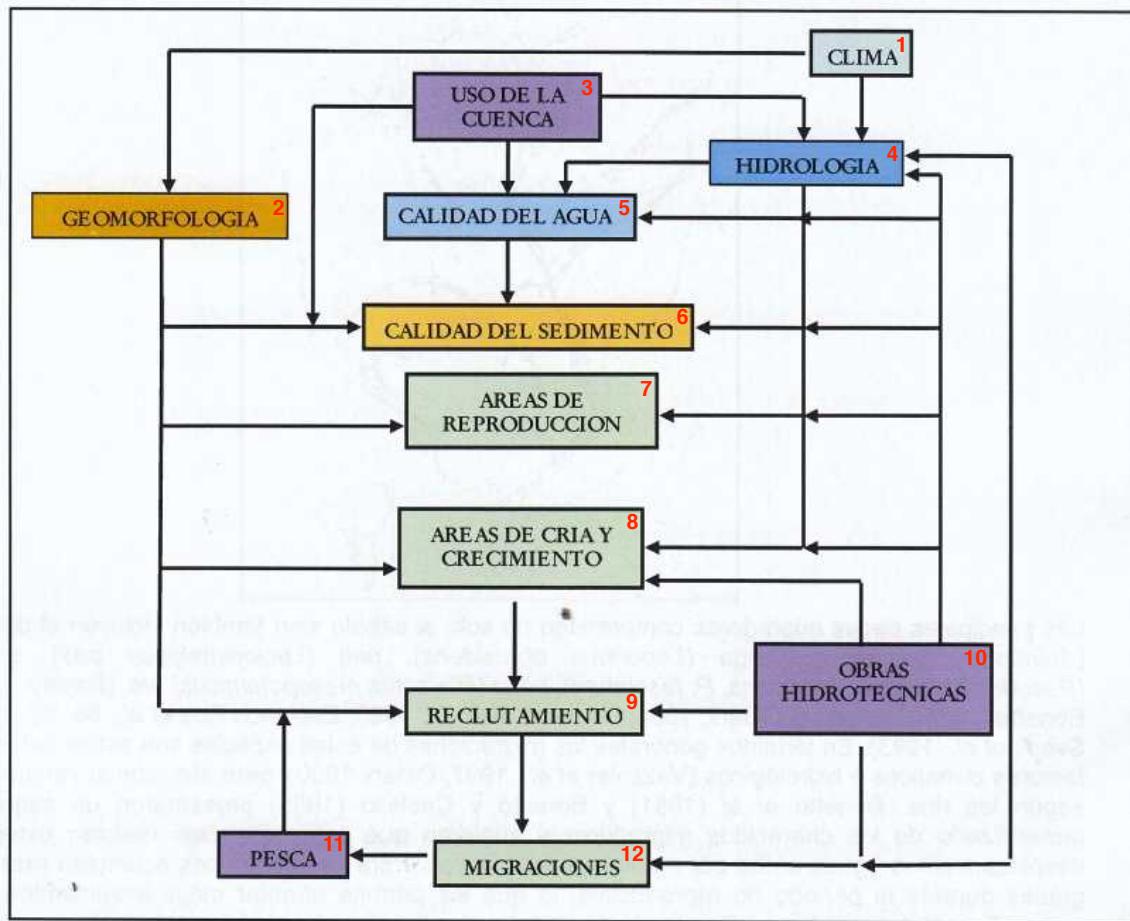


#	Translations from Figure A1.2
1	Problems: Physical impacts to population, activities, infrastructure and equipment due to natural phenomena
2	EG proposal
3	Asunción workshop
4	Cause
5	Problem
6	Effect
7	Indicators
8	Poorly equipped academic institutions and management
9	Poor institutional capacity to monitor and systematize hydrological information
10	Absence of coordination of actions to face extreme events
11	Insufficient monitoring of extreme events
12	Disjointed regional scientific research and dissemination centers
13	Poor support for the development and collection of specific knowledge
14	Inefficient policy to promote research and dissemination of knowledge
15	Insufficient information coverage and management
16	Disjointed institutional coordination to cope with extreme events
17	Extreme events not predicted
18	Contingency plans not defined
19	Physical impacts to population, activities, infrastructure and equipment due to natural phenomena
20	Impairment of economic activity
21	Deterioration of infrastructure and properties
22	Impoverishment

Caption Above: "THEMATIC GROUP A / DENOMINATION: Water Resources / PROBLEMS: Physical impacts to population, activities, infrastructure and equipment due to natural events"

Fig. A1.3

Figura 1-1. Modelo conceptual de relaciones entre el desarrollo de diferentes etapas del ciclo biológico del sábalo con factores de origen natural y antrópico. Los cuadros en verde indican los componentes bióticos, los cuadros violetas representan el componente antrópico



#	Translations from Figure A1.3
1	Climate
2	Geomorphology
3	Use of the basin
4	Hydrology
5	Water quality
6	Sediment quality
7	Reproduction areas
8	Growth And brooding areas
9	Recruitment
10	Hydrotechnical works
11	Fishing
12	Migrations

Caption Above: "Figure 1-1. Conceptual Model of relations between the development of different stages of the biological cycle of shad with factors of natural and anthropogenic origin. The squares in green indicate the biotic components, the violet squares represent the anthropogenic components."

Fig. A1.4

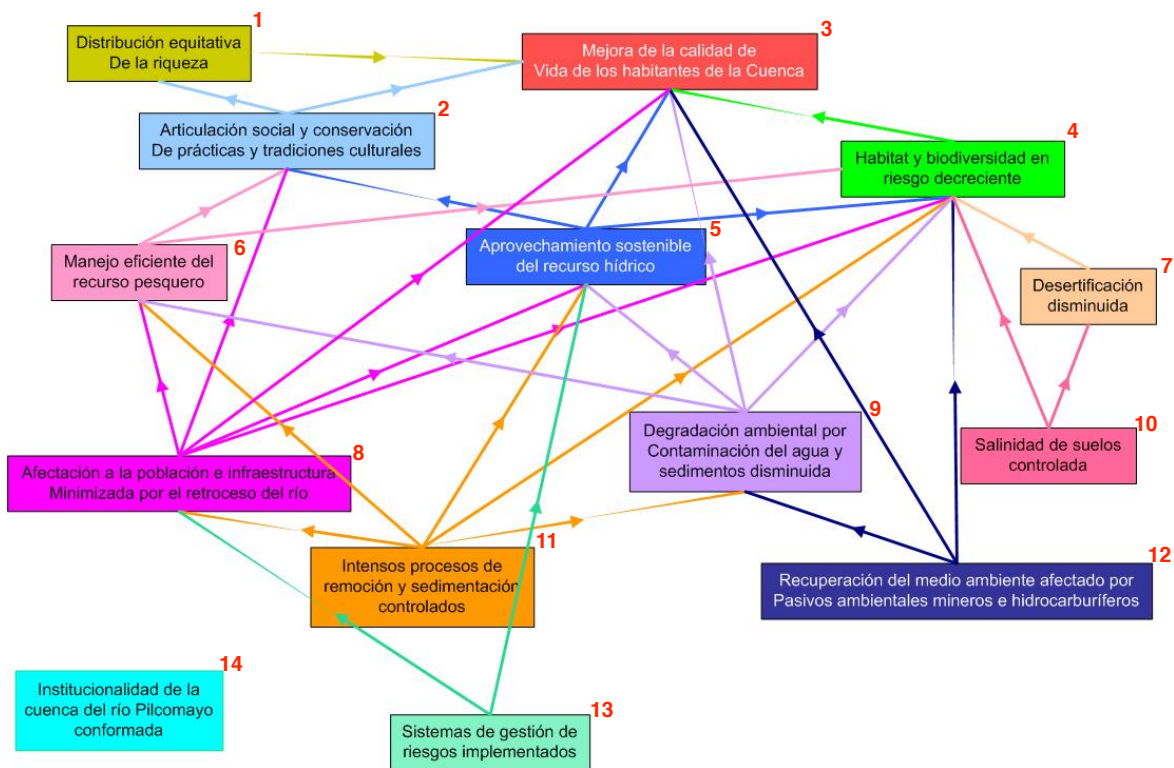


Figura Nº 6: Esquema árbol integrado de objetivos. Proyecto Pilcomayo.

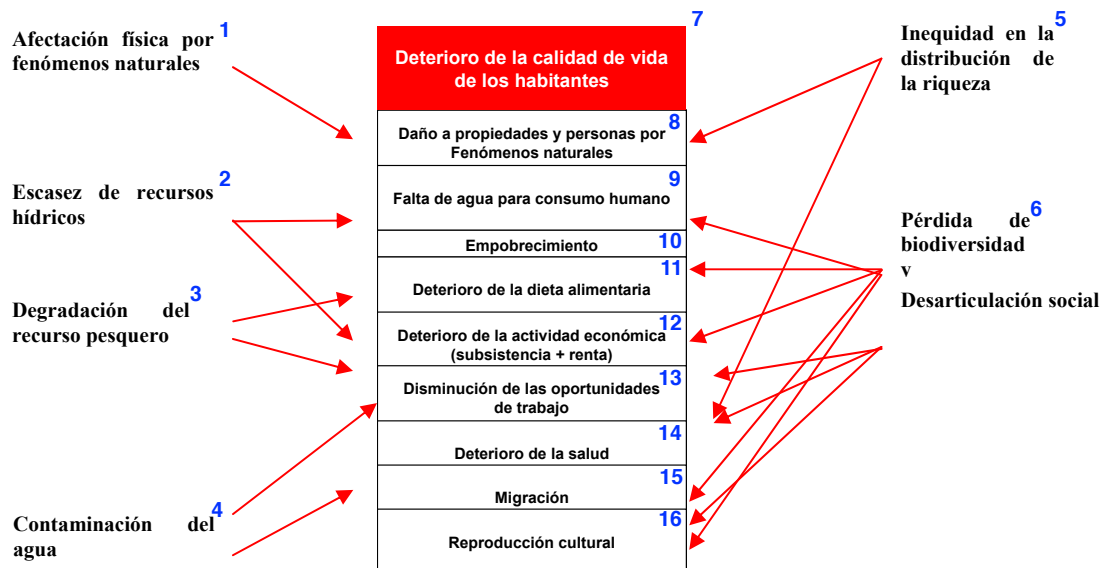
#	Translations from Figure A1.4
1	Equitable distribution of wealth
2	Social connectedness and conservation of cultural practices and traditions
3	Quality of life improvement for inhabitants of Basin
4	Decreasing risk to habitat and biodiversity
5	Sustainable use of the water resource
6	Efficient management of fisheries resources
7	Decreased desertification
8	Minimized impacts to population and infrastructure from river retreat
9	Environmental degradation from water contamination and decreased sediments
10	Controlled salinization of soils
11	Control of intense removal and sedimentation processes
12	Recovery of environment affected by mining and hydrocarbon environmental liabilities
13	Implemented systems of risk management
14	Established institutionality of the Pilcomayo River Basin

Caption Below: "Figure No. 6: Integrated tree outline of objectives. Project Pilcomayo"



Fig A1.5

**Deterioro de la calidad de vida de los habitantes:** El gráfico indica interrelaciones de problemáticas con este fenómeno.



#	Translations from Figure A1.5
1	Physical effects from natural phenomena
2	Scarcity of water resources
3	Degradation of fishing resources
4	Contamination of water
5	Inequity in the distribution of wealth
6	Loss of biodiversity and social disconnectedness
7	Deterioration of the quality of life of the inhabitants
8	Damage to properties and persons from natural phenomena
9	Lack of water for human consumption
10	Impoverishment
11	Deterioration of food diet
12	Deterioration of economic activity (subsistence and income)
13	Decline in employment opportunities
14	Deterioration of health
15	Migration
16	Cultural reproduction

Caption Above: "Deterioration of the quality of life of the inhabitants: The graphic indicates interrelationships of problems with this phenomena"

Fig A1.6

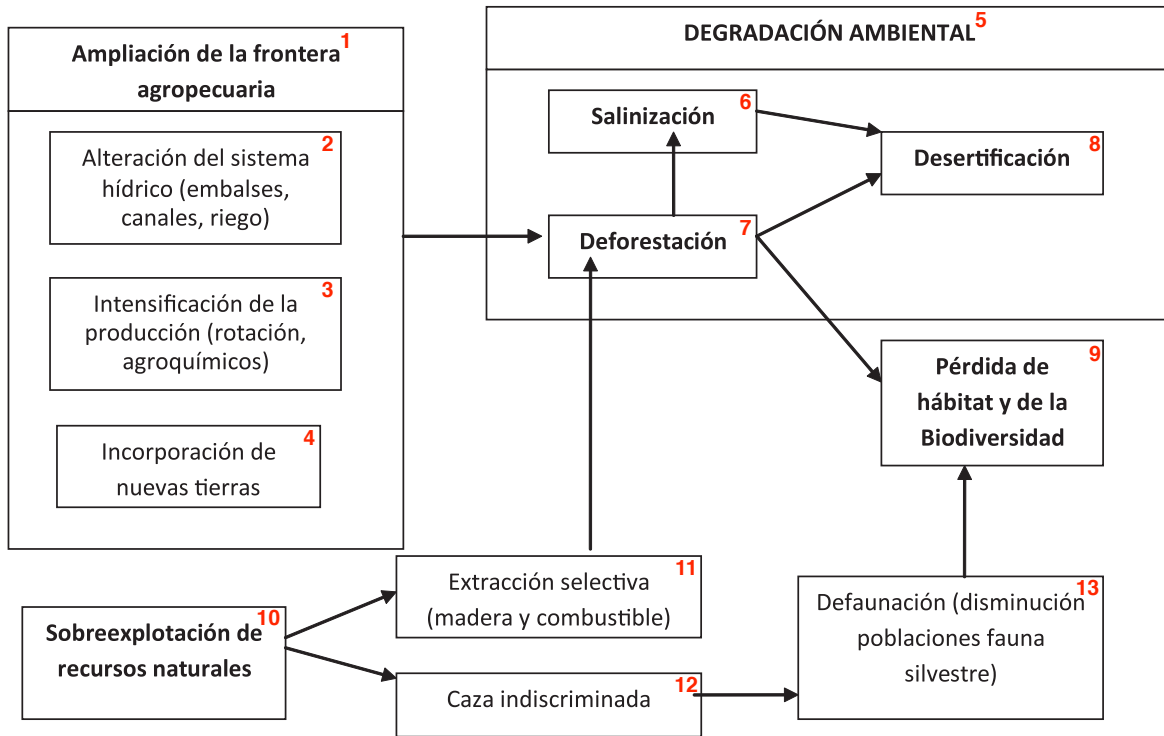


Figura 4.6 1 Relaciones causa-efecto entre los distintos procesos de degradación en los ecosistemas terrestres de la cuenca del río Pilcomayo (ver texto)

#	Translations from Figure A1.6
1	Agricultural frontier expansion
2	Alteration of the water system (reservoirs, canals, irrigation)
3	Intensification of production (rotation, agrochemicals)
4	Incorporation of new lands
5	Environmental Degadation
6	Salinization
7	Deforestation
8	Desertification
9	Habitat and Biodiversity loss
10	Overexploitation of natural resources
11	Selective extraction (wood and fuel)
12	Poaching
13	Loss of fauna (decline in wild fauna populations)

Caption Below: "Figure 4.6 1 Cause-effect relations between distinct processes of degradation in terrestrial ecosystems of the Pilcomayo River Basin (see text)"