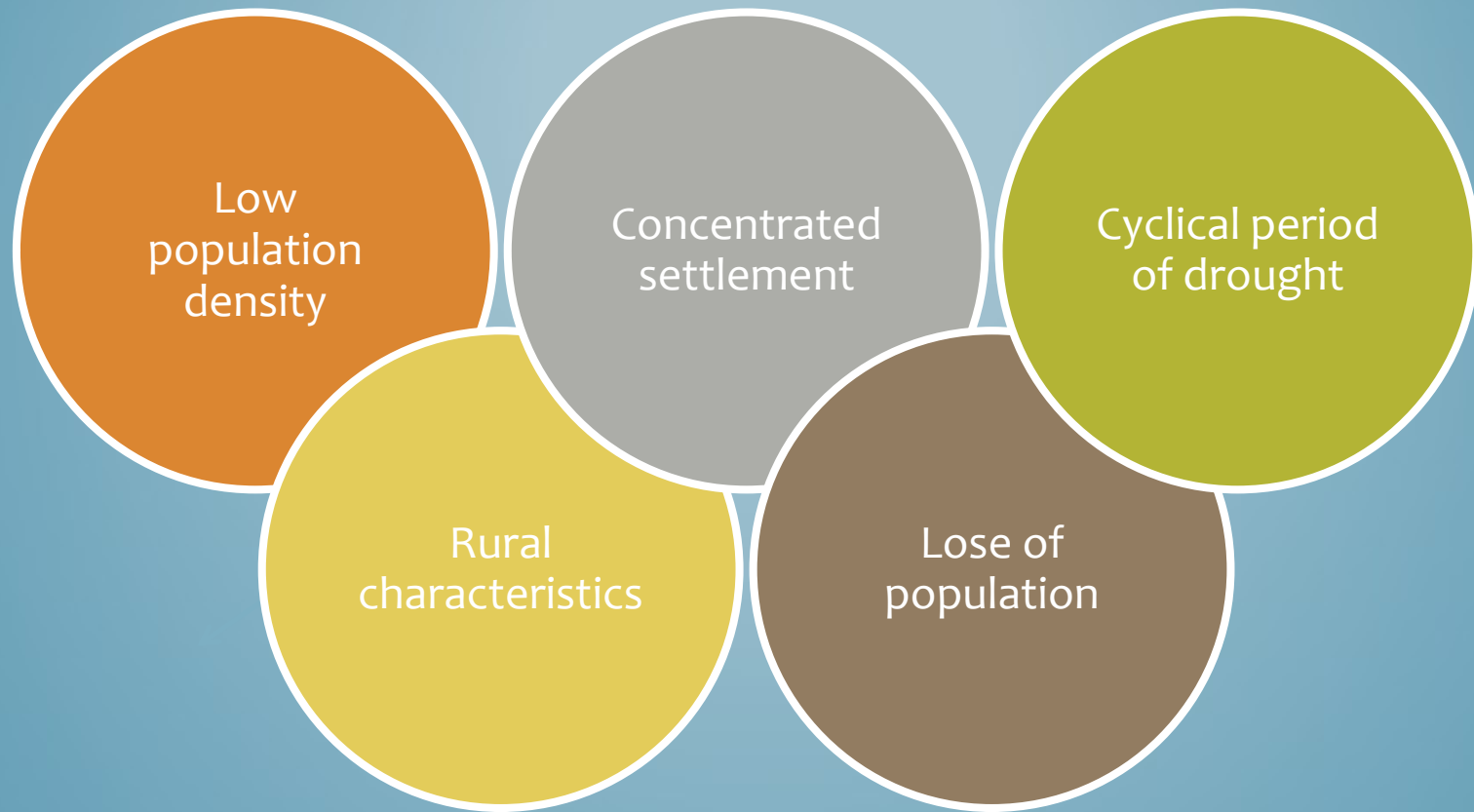


ALQUEVA MULTI-PURPOSE PROJECT

BRIEF PRESENTATION



ALENTEJO – THE TERRITORY



ALENTEJO – THE TERRITORY

Total Surface

27 000 km²

Useful Agriculture Area

1 900 000 ha

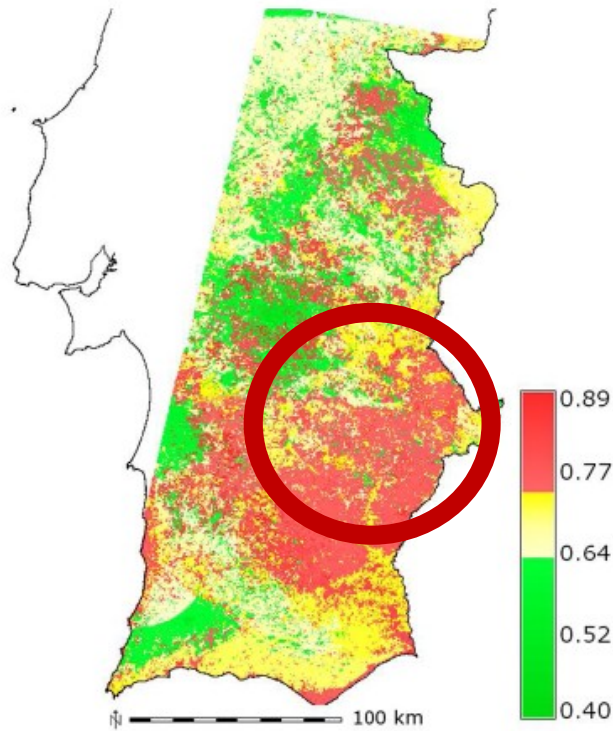
Alqueva Irrigation Area

+ 110 000 ha

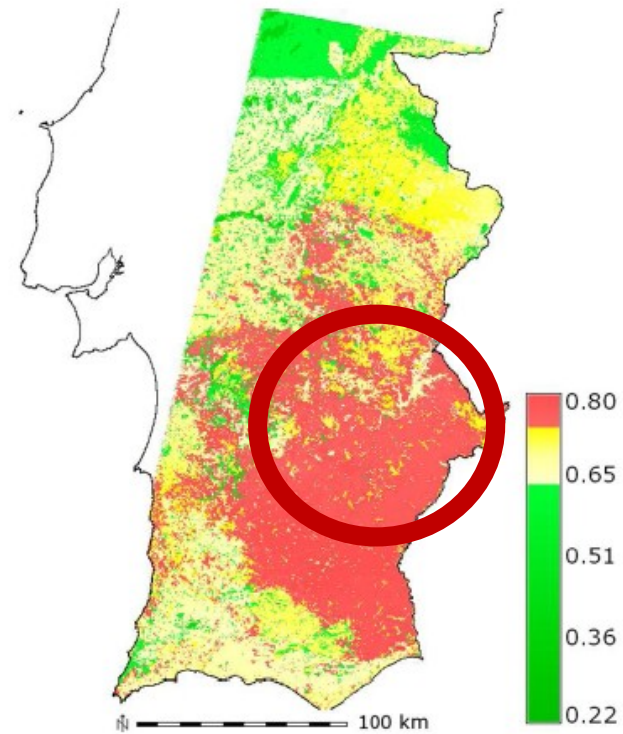


INDEX OF SUSCEPTIBILITY TO DESERTIFICATION NATIONAL SCALE

1999



2009



Portugal



© Usar

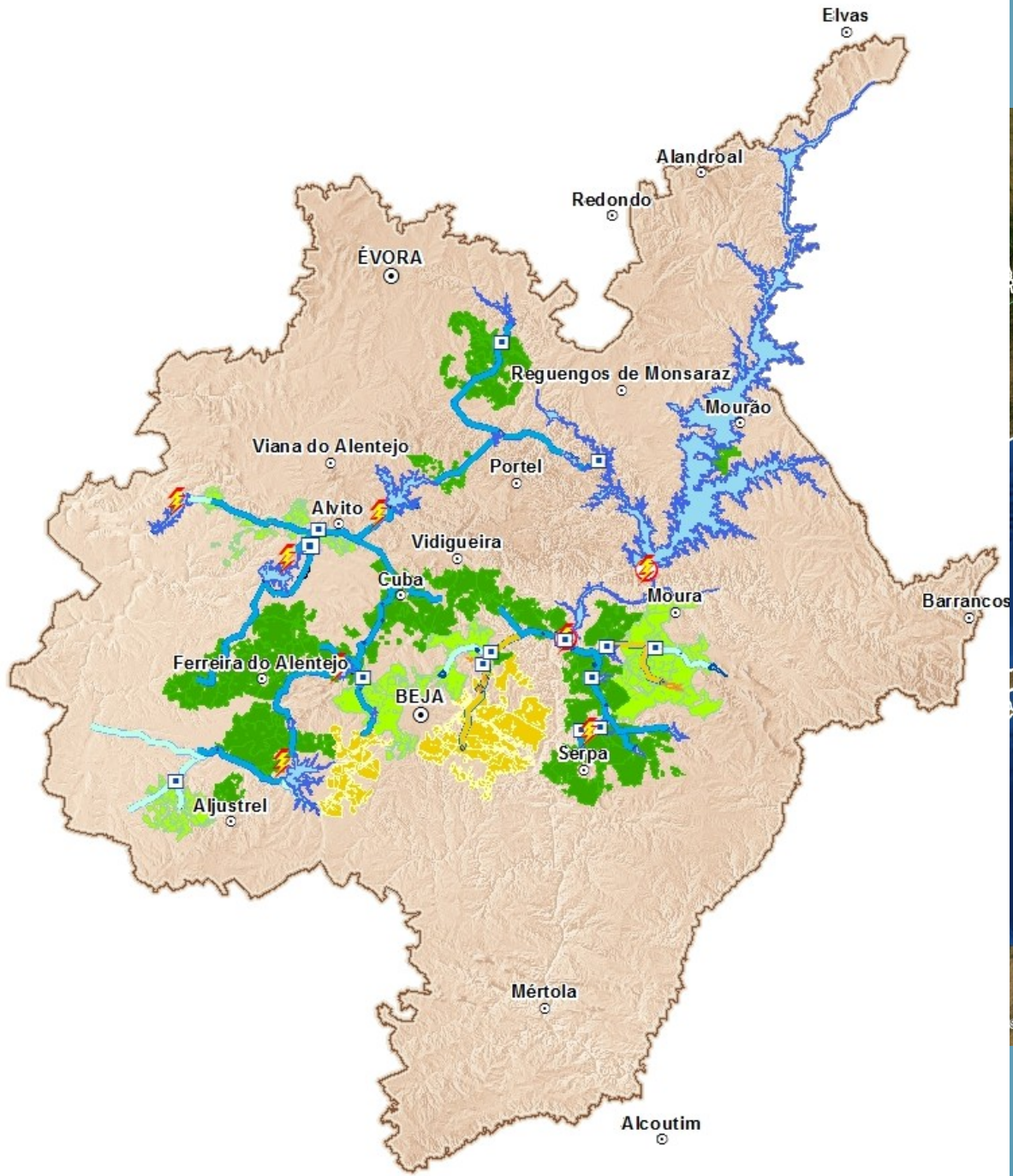
Hydraulic infrastructures



Water uses



Economic and social development



PURPOSES

Creation of a Strategic Water Reserve

Guarantee of Water Supply

Production of Clean Energy

Environmental Improvement

New Agricultural Activities

Contribution for the Development of a Quality Tourism

Creation of New Business Opportunities

Improve the Labour Market

- Alqueva Dam and Power Plant
- Pedrógão Dam and Power Plant
- Primary Network
- Secondary Network

ALQUEVA AND PEDRÓGÃO RESERVOIRS



Alqueva Reservoir

Surface: 250 km²
Shoreline: 1 160 km
Full Capacity: 4 150 hm³
Useful Capacity: 3 150 hm³



Pedrógão Reservoir

Surface: 11 km²
Shoreline: 118 km
Full Capacity: 106 hm³
Useful Capacity: 54 hm³

Water Abstraction, Storage, Regularization and Supply

- ✓ 45 By Pass Dams
- ✓ 5 Small Power Plants
- ✓ 380 km of Channels
- ✓ 15 Pump Stations

Reinforce public water supply



Agriculture

- ✓ 23 Regularisation dams
- ✓ 37 Secondary Pump Stations
- ✓ 1 577 Km of underground pipelines
- ✓ 3 973 hydrants

More than 110 000 ha irrigated land

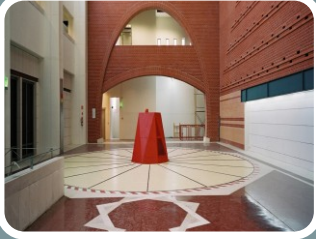


SECONDARY NETWORK



Alqueva Global System

+ 110 000 ha irrigated area



Alqueva Power Plant

- Power: 520 MW



Pedrógão Power Plant

- Power: 10 MW



5 small power plants

- Power: 9,6 MW



Public Supply

- Monte Novo, Alvito e Roxo: Regular
- Enxoé: Test
- Sines: Negotiation



Hydropower production

- Turbined Water : 3.476 hm³
- Pumped Water : 3.059 hm³



Irrigation

- 106 hm³ (2013)
- Area benefit – 65.724 ha
- Area irrigated – 40 749 ha

ALQUEVA MULTI-PURPOSE PROJECT ENVIRONMENT AND SUSTAINABILITY



THE ALQUEVA PROJECT AND THE SUSTAINABILITY OF THE REGION

The regularization of the flow of the Guadiana river, in order to significantly mitigate the effects of prolonged drought and increase reliability of water supply.

A strategic water reserve in the Alentejo region.

More efficient management of surface water resources of the region.

The increase of economic income of the region and the fight against social desertification.

THE ALQUEVA PROJECT AND THE SUSTAINABILITY OF THE REGION

The maintenance of river ecosystems and their environmental functions.

The significant decrease in pressure on groundwater resources.

The minimization of socioeconomic and environmental impacts resulting from extreme hydrological situations.

A spatial planning more sustainable and balanced, which contributes to increased social cohesion in a depressed region.

ENVIRONMENTAL MANAGEMENT

1995

- Global environmental impact assessment.
- Positive opinion conditional on adoption of environmental management of the Project, with the definition of its program.

1997

- Presentation of the Environmental Management Program (EMP).

2004/2005

- Review process of the EMP.
- Approval of the EMP through the Joint Ministerial Order no. 1050/2005 of the Ministries of Agriculture and Environmental and Regional Development.

A long term Programme for all the project.

ENVIRONMENTAL MANAGEMENT - MAIN AREAS



Environmental assessment studies



Pre-inundations activities



Environmental attendance – construction phase

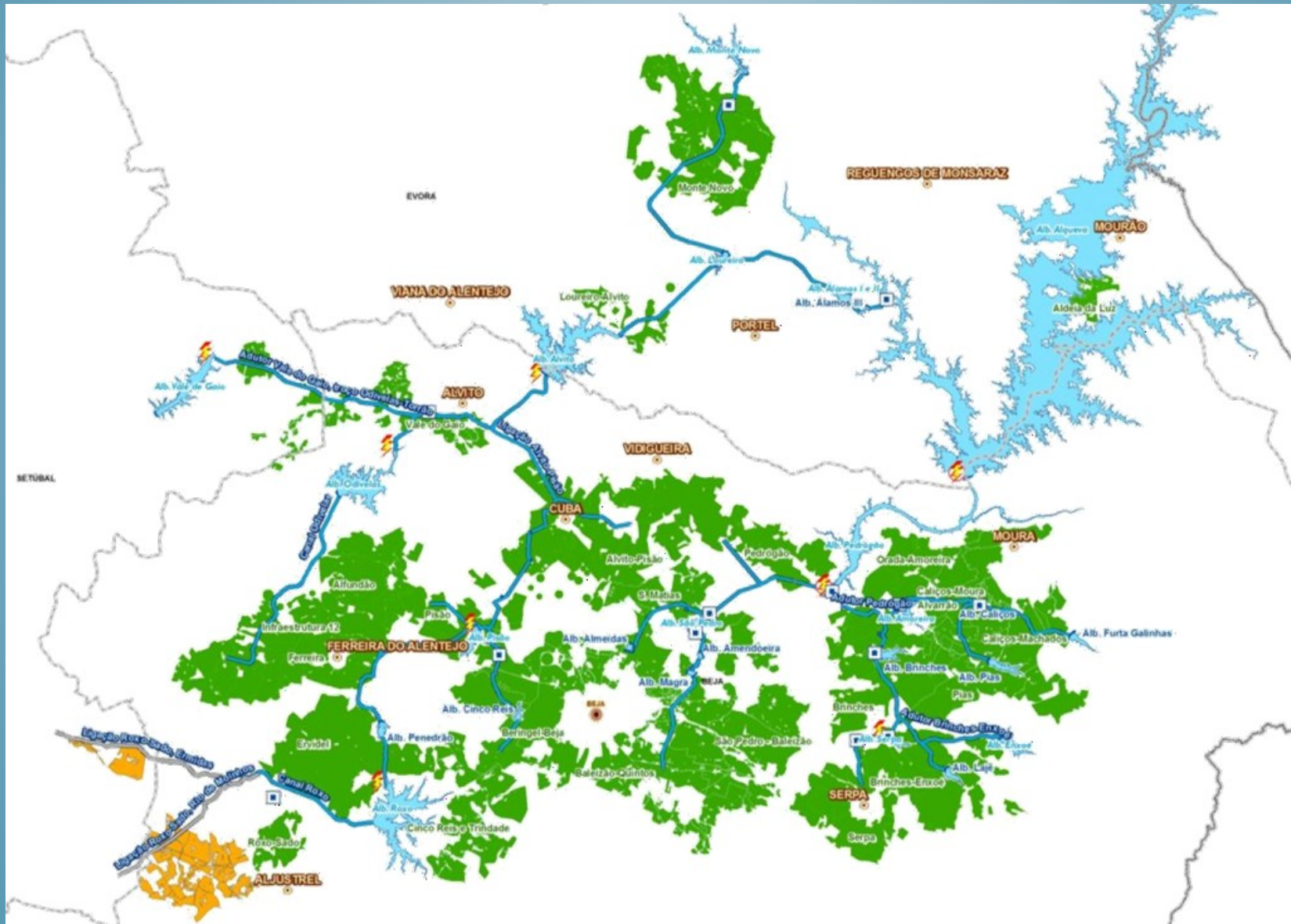


Environmental monitoring (water)



Natural Resources (water)

ENVIRONMENTAL IMPACT ASSESSMENT



PRE-INUNDATION ACTIVITIES



Deforestation



Dismantling and demolition of construction in the reservoir area



Waste Dumps and Scrap Yards Remediation



Compensation of negative social impacts, including loss of property



Replacement of community facilities and network accessibility

CONSTRUCTION PHASE - CULTURAL HERITAGE



Archaeological follow-up.



Archaeological excavations.



Archaeological surveys (manual and mechanical).



Transport of architectural elements for deposits accredited.



Sealing and protection of archaeological remains.

ENVIRONMENTAL ATTENDANCE – CONSTRUCTION PHASE

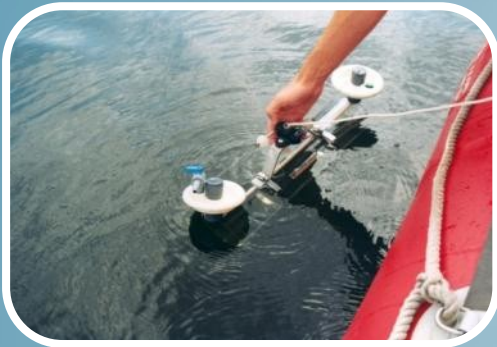
To define environmental management system and implementation.

To support and to verify the implementation of environmental requests.

To define and implement environmental procedures.



ENVIRONMENTAL MONITORING



State of surface
water bodies



State of
groundwater bodies



Biodiversity



Soil



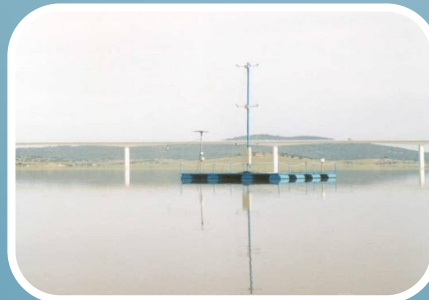
Cultural Heritage

ENVIRONMENTAL MONITORING – WATER STATUS

Start monitoring water quality (exploration phase) with the closure of the gates of Alqueva dam, in February 2002.

Definition of a monitoring program that considers the primary infrastructure as a whole.

The definition of the program considered competencies conferred by EDIA Concession Agreement, signed with the Portuguese State, and the activities defined in the Environmental Management Program of Alqueva Project.

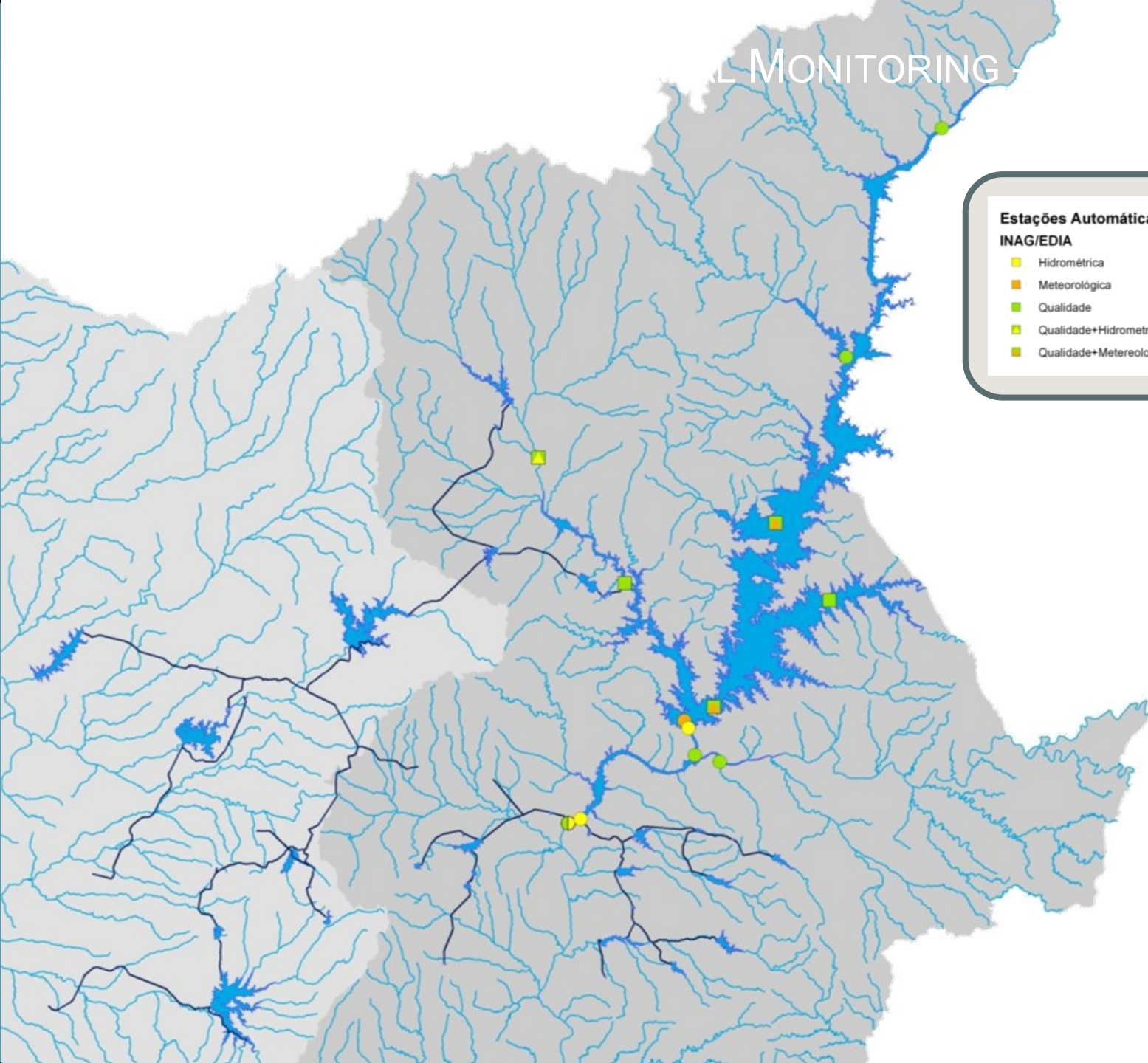


ENVIRONMENTAL MONITORING – WATER STATUS

GOALS

- Assess the adequacy of water stored and in transit in the system, compared to the uses specified in the Concession Agreement.
- Safeguarding EDIA the responsibility of any deterioration in water quality due to the actions taken by third parties.
- Identify potential problems in the quality of the influent water to the reservoirs.
- Identify sudden changes in the quality of water stored in reservoirs.
- Get information for calibration and measurement of water quality models.

MONITORING WATER STATUS



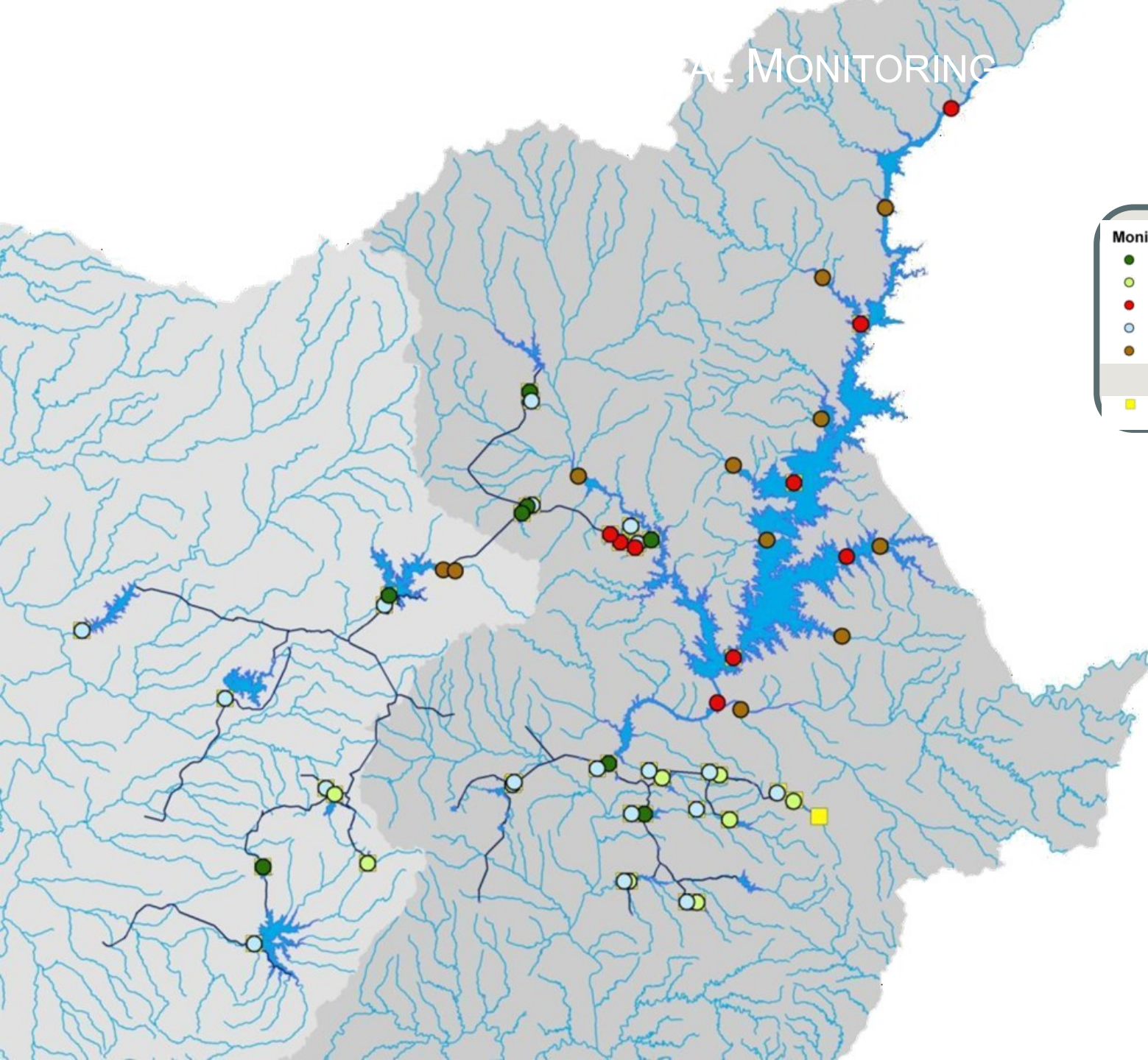
Estações Automáticas
INAG/EDIA

- Hidrométrica
- Meteorológica
- Qualidade
- Qualidade+Hidrometria
- Qualidade+Metereologia

EDIA

- Hidrométrica
- Meteorológica
- Qualidade
- Qualidade+Hidrometria
- Qualidade+Metereologia

QUAL MONITORING POINT STATUS



Monitorização Físico-Química

- Captação EFMA
- Captação Rega
- Evolução Qualidade
- Caudal Ecológico
- Cargas Afluentes

■ Monitorização Ecológica

NATURAL RESOURCES – WATER MANAGEMENT

Identification of pressures to which water bodies of Alqueva Project are subject.

Identification of appropriate measures to reduce pollutant loads reaching water bodies.

Implementation of measures to prevent degradation of water quality.

STRATEGIC CHALLENGES - WATER

Quality

- Protection and conservation of water resources
- Reduction of degradation sources

Quantity

- Efficient irrigation technologies
- Good use of water in agriculture

Environment

- Maintenance of water ecosystems and their environmental functions
- Decrease in pressure on groundwater

Sustainable water use