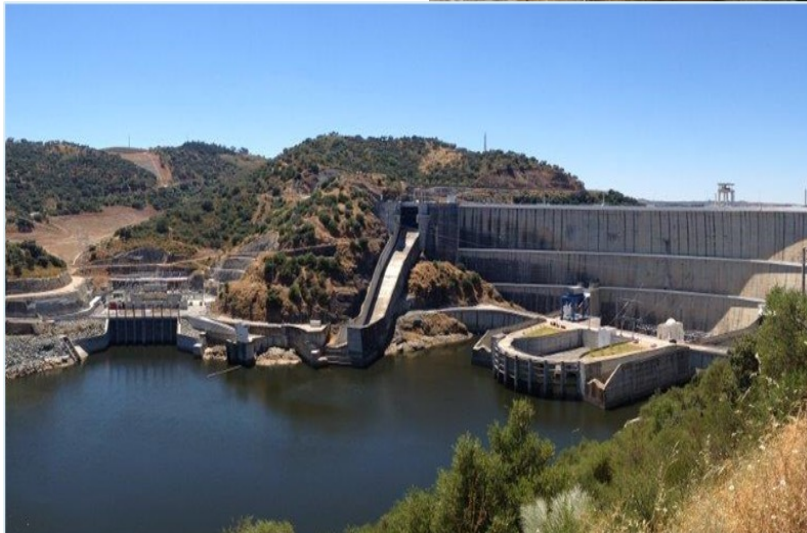




ON A CLEAR DAY YOU CAN SEE FOREVER

ALQUEVA PROJECT

Irrigation Challenges in the South of Portugal and the impact on Land Valuation



ALQUEVA MULTIPURPOSE PROJECT

130 000 HECTARES OF IRRIGATION IN PORTUGAL

THE PROJECT MAIN DATES

1957: Preparation of the Alentejo Irrigation Plan, which assumes the need to build the Alqueva dam.

1968: Celebration of the agreement between Portugal and Spain to regulate the use and hydraulic exploitation of sections of common international rivers and which assigns to Portugal the hydraulic exploitation of the section of the Guadiana river between the confluences with the Caia river and the Cuncos river and the corresponding unevenness of the tributaries.

1976: Creation of the Alqueva Commission and beginning of preliminary works.

1993: Creation of the Installation Committee of the Company of Alqueva.

1994/1995: Integrated Environmental Impact Study

1995: Creation of the Development and Alqueva Infrastructures (EDIA) and restart of work with carrying out excavations in the first phase.

THE PROJECT MAIN DATES

1998: Concreting begins at the Alqueva Dam.

1999: Award of the construction contract for the new Aldeia da Luz.

2000: Award of the contract for the execution of the first irrigation block of the Global Irrigation System, infrastructure 12, located in the municipality of Ferreira do Alentejo.

2002: Closing of the dam gates and beginning of filling the reservoir. Inauguration of the first irrigation block. Transfer of the cemetery from the village of Luz. The inhabitants of the old village begin moving to the new village, built from scratch. Inauguration of E. Elevatória dos Álamos with a nominal power of 42 MW.

2003: The old village of Luz is dismantled and the last family moves to a new village.

2004: Alqueva Hydroelectric Plant starts operating. 2015 was presented as the new deadline to complete the Alqueva irrigation infrastructure, 10 years earlier than initially planned.

2006: Inauguration of the dam and Pedrogão Hydroelectric Power Station.

THE PROJECT MAIN DATES

2010: On January 12, the reservoir reaches maximum capacity, becoming the largest artificial lake in Europe, and controlled discharges begin. Connections have been completed between the Alqueva “mother” reservoir and five public water supply reservoirs covered by the project, which will now be able to reinforce supply to 13 municipalities in the districts of Beja and Évora, with a total of more than 200 thousand inhabitants.

2011: Completion of the installation of the project's five mini-hydro plants.

2015/16: EDIA completes, around 10 years before the initially scheduled date (2025), the construction of all infrastructure to irrigate the 120 thousand hectares of the first phase of the project. The Roxo reservoir receives water from Alqueva for the first time to guarantee irrigation and public Alqueva supply to the municipalities of Beja and Aljustrel.

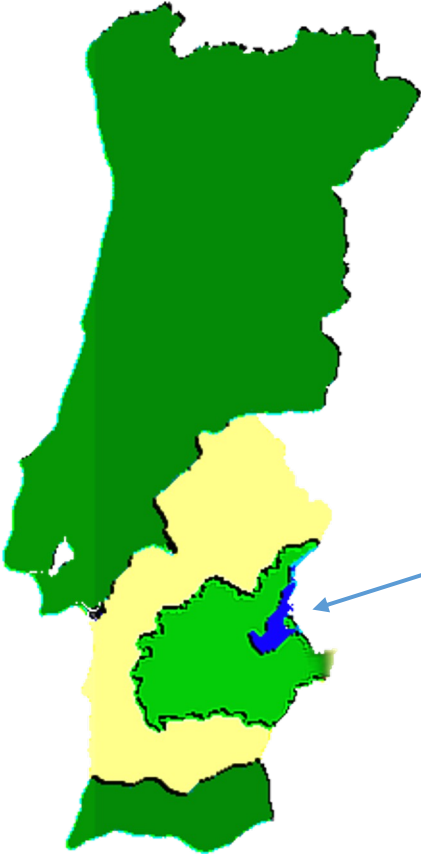
THE PROJECT MAIN DATES

2017: Alqueva integrates the National Irrigation Plan, planning to move forward with the second phase of the project to expand irrigation by around 50 thousand hectares.

2019: Start of work on the second phase to expand irrigation. EDIA announces investment of 50 million euros to install 10 floating photovoltaic plants in the project, creating “the largest floating photovoltaic project in Europe”.

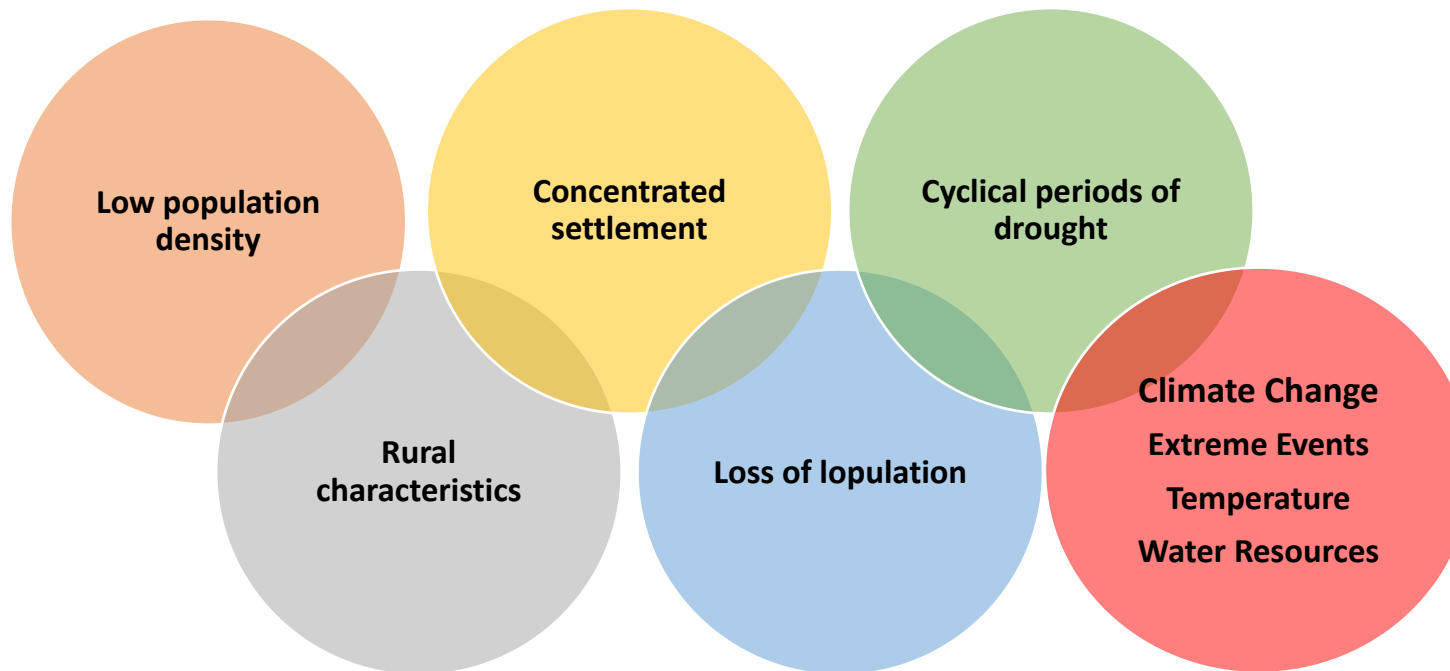
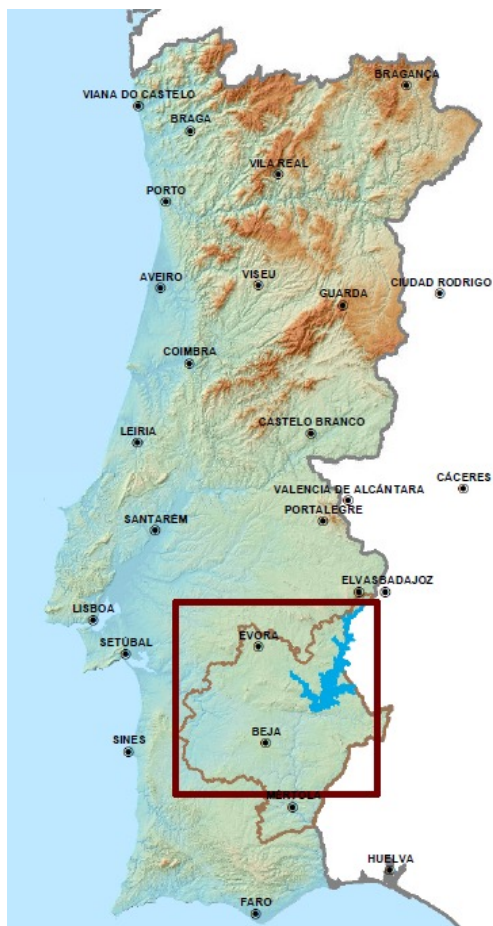
2021: Construction of the first three irrigation blocks of the second phase of the project ends to benefit around 10 thousand hectares. These are the blocks of Évora, Viana do Alentejo and Cuba/Odivelas, which are in a position to start operating in the 2022 irrigation campaign. The connection to the Sto André canal, next to the Ermidas, which allows for reinforcement to the Sines Industrial Complex and also the reinforcement of the Fonte Serne dam and its irrigation perimeter.

LOCATION AND INFLUENCE AREA

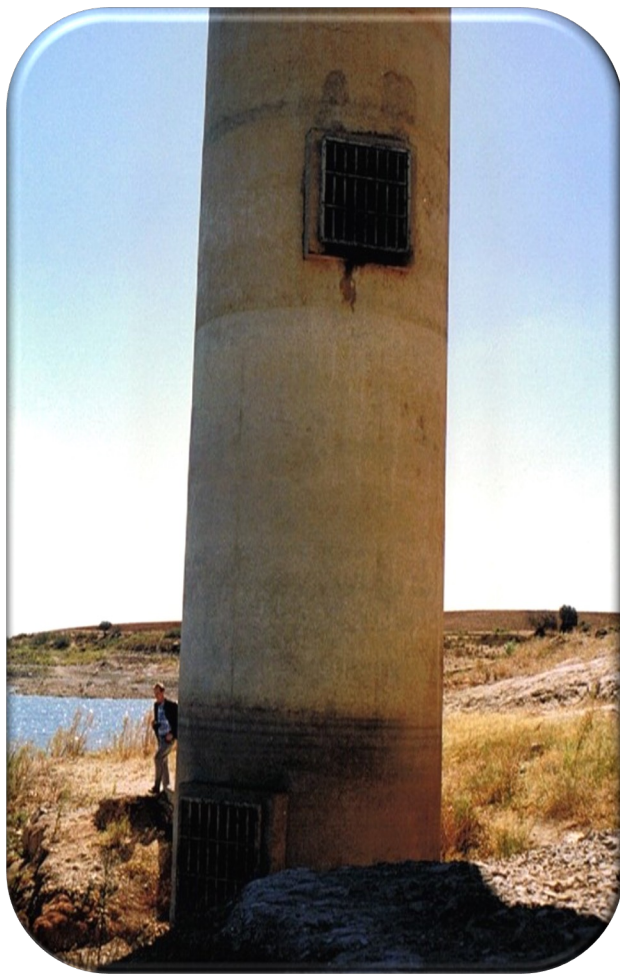


10 000 km²

ALENTEJO – THE TERRITORY



ROXO RESERVOIR – SUMMER 1995

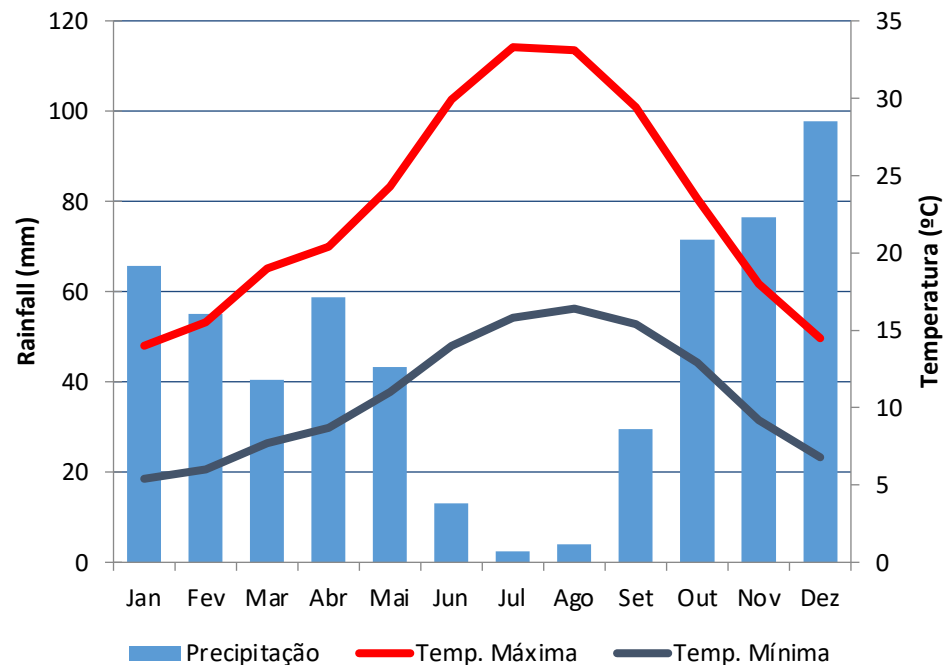


In its 40 years of existence, the Roxo reservoir suffered restrictions on water supply in 30 years.

Water Intake - Public supply

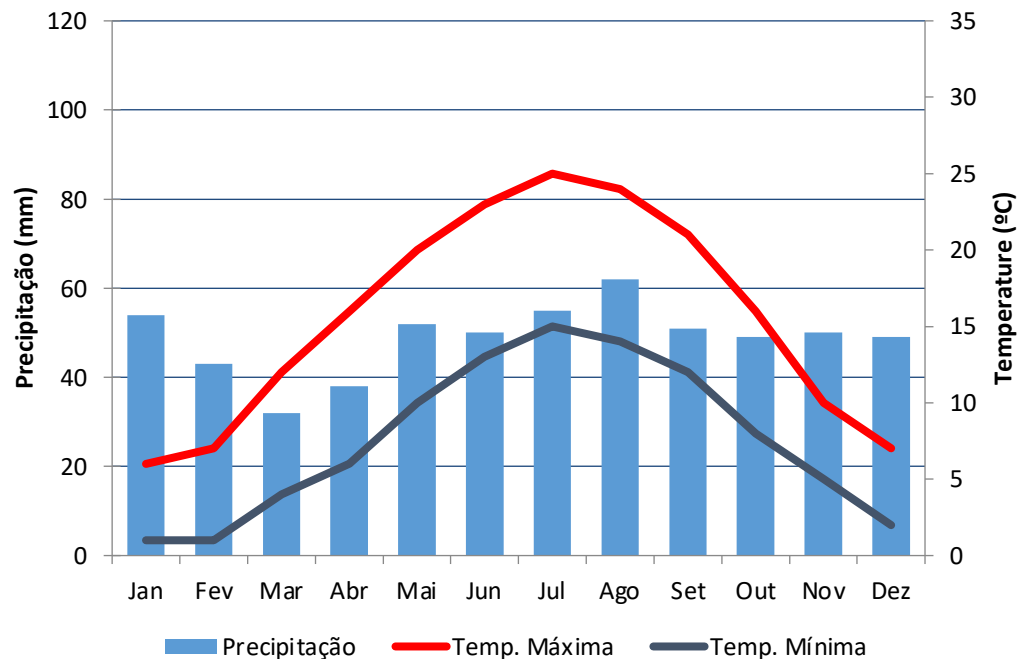
TEMPERATURE / RAINFALL

Beja, Portugal



Mediterranean climate

Paris, France



Continental climate

ALENTEJO – THE TERRITORY

Total area

27 000 km²

Useful agricultural area

1 900 000 ha

ALQUEVA – Irrigation area 1st phase (concluded)

120 000 ha

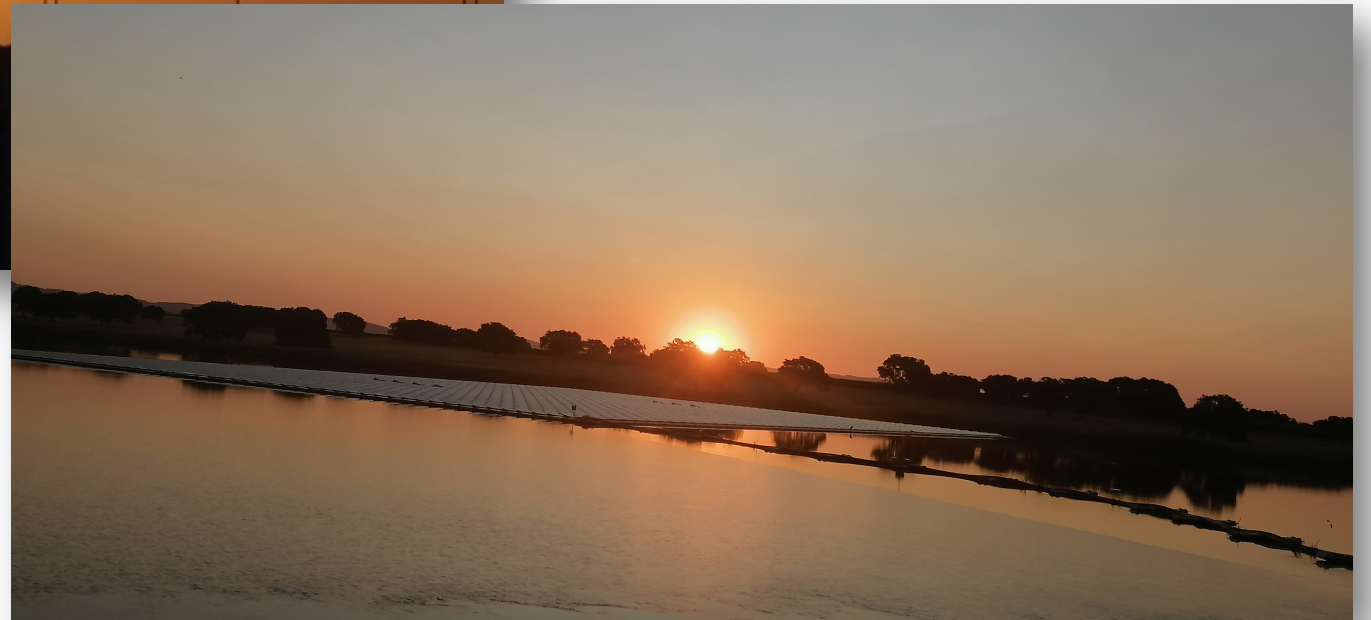
ALQUEVA – Irrigation area today

130 000 ha

ALQUEVA– PURPOSES

- **Creation of a strategic water reserve**
- **Guarantee of water for human consumption, agriculture and industry**
- **New agricultural activities**
- **Produce renewable energies**
- **Development of quality tourism**
- **Improve the labour market**

3 000 HOURS OF SUNSHINE PER YEAR



MAIN COMPONENTS OF THE PROJECT

- **Alqueva Dam and Hydroelectric Plants**
- **Pedrógão Dam and Hydroelectric Plant**
- **Primary Network**
- **Secondary Network**
- **Álamos Pumping Station**

ALQUEVA DAM



PEDRÓGÃO DAM



PEDRÓGÃO DAM



ALQUEVA



HYDROELECTRIC PLANTS

Alqueva

2 Plants x 260 MW

520 MW



Pedrógão

10 MW



5 Mini Hydro Power Plants

9,6 MW



PRIMARY AND SECONDARY NETWORK

- **130 000 ha irrigated area**
- **72 dams and reservoirs**
- **48 pumping stations**
- **2 078 Km of network**
- **4 000 hydrants**

130 000 ha - Irrigated area



PRIMARY NETWORK

Catchment, Storage, Regularisation and Distribution of Water

- **23 Intermediate Reservoirs**
- **5 Small Hydroelectric Power Plants**
- **400 km of Channels**
- **6 Pumping Plants**

Reinforcement of public supply



PRIMARY NETWORK



Adductor channel

PRIMARY NETWORK



Adductor channel

GLOBAL IRRIGATION SYSTEM

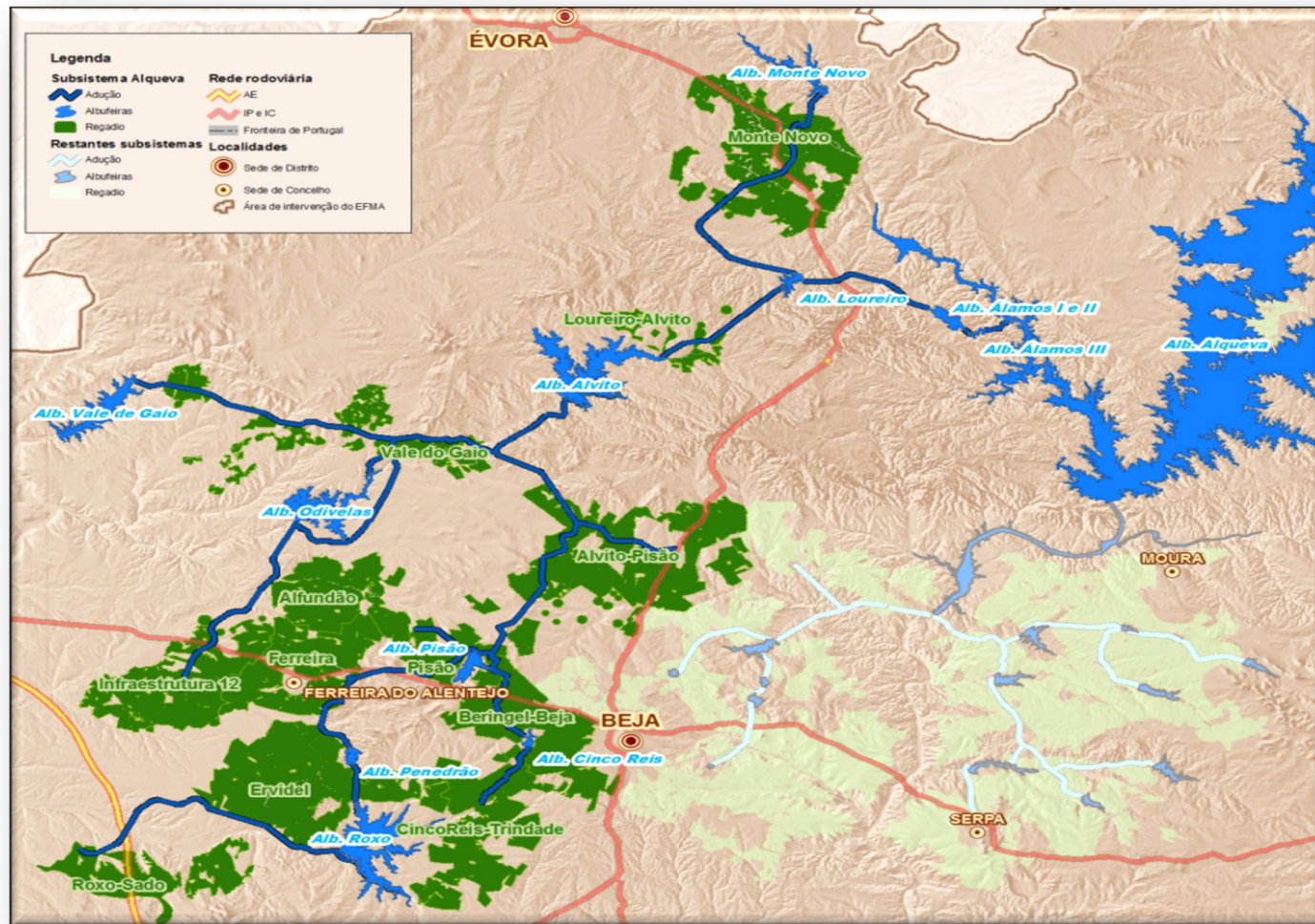


Pumping station

Alqueva reservoir

42 m³/s

GLOBAL IRRIGATION SYSTEM



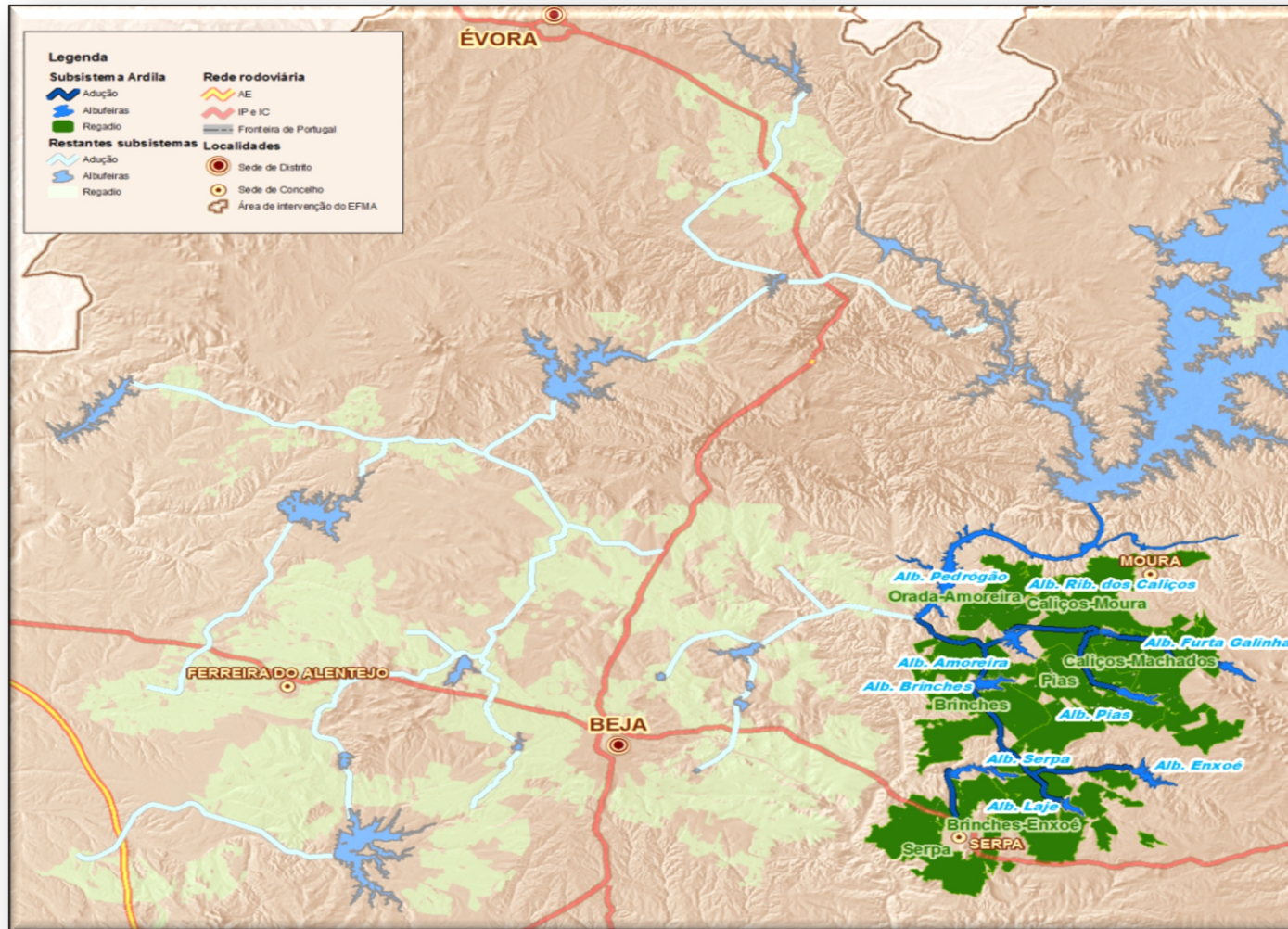
Alqueva subsystem
75 000 ha

GLOBAL IRRIGATION SYSTEM



Pumping station
Pedrógão reservoir
19 m³/s

GLOBAL IRRIGATION SYSTEM



Pedrógão Subsystem
30 000 ha

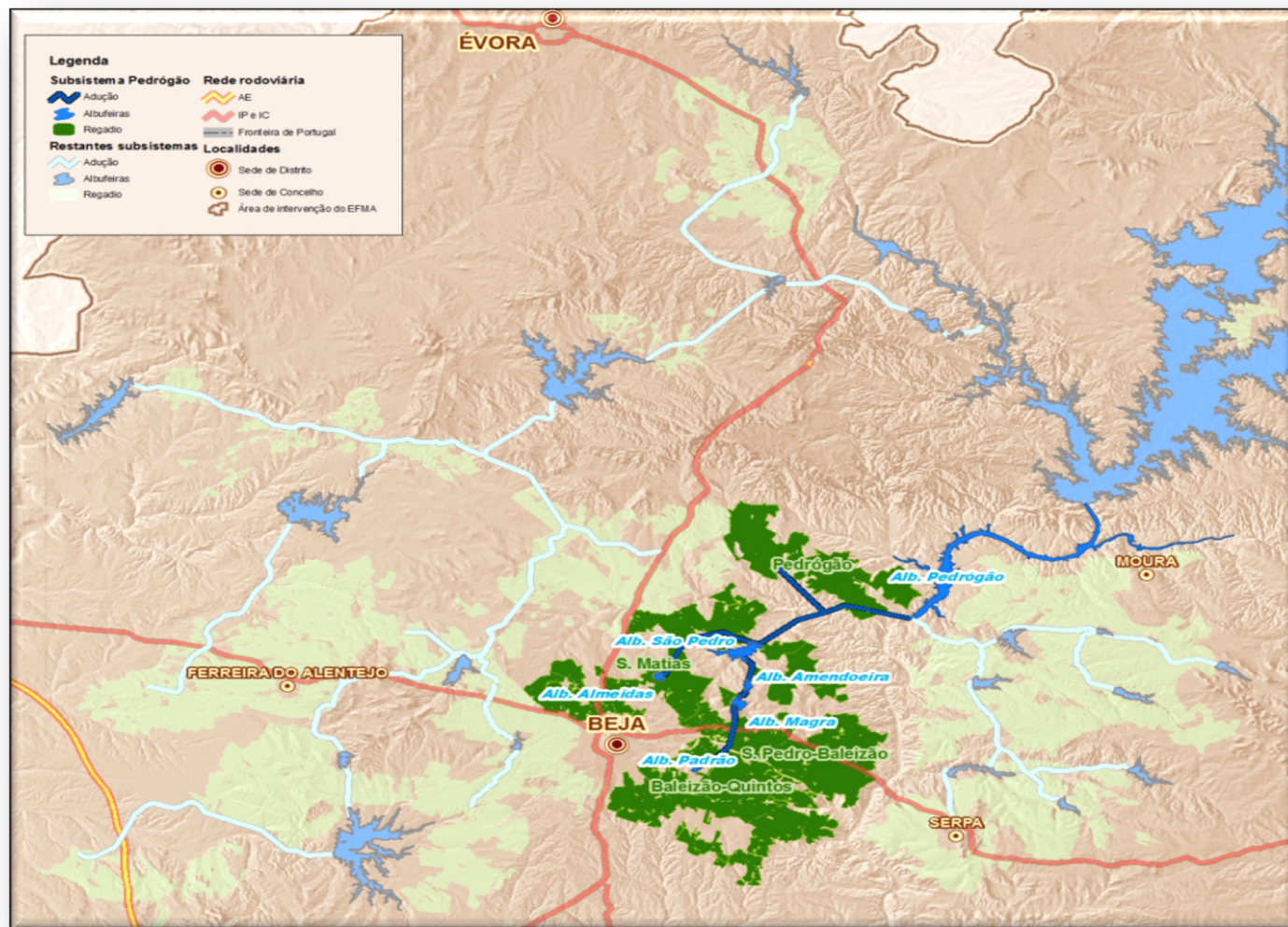
GLOBAL IRRIGATION SYSTEM



Pumping station
Pedrógão reservoir

12 m³/s

GLOBAL IRRIGATION SYSTEM



Pedrógão Subsystem
25 000 ha

SECONDARY NETWORK



**RESERVOIR AND
SECONDARY
PUMPING STATION**

SECONDARY NETWORK



**RESERVOIR AND
SECONDARY
PUMPING STATION**

SECONDARY NETWORK



**SECONDARY
PUMPING STATION**

SECONDARY NETWORK



Hydrant (water intake for farmers)



GLOBAL IRRIGATION SYSTEM

What has changed with Alqueva?

CROPS

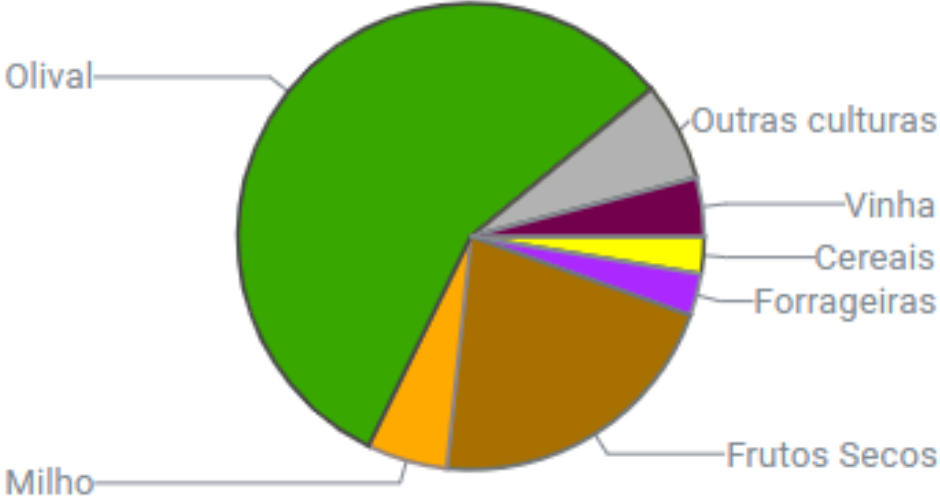


CROPS - OCCUPATION | 2023



CROPS - OCCUPATION | 2023

CROPS



OLIVE GROVE	57%
ALMOND.....	22,5%
CORN.....	5,5%
VINEYARDS.....	3,5%
FORAGERS.....	3,5%
CEREALS.....	2,5%
OTHER CROPS.....	5,5%

CROPS

- **Main crop: Olive – 66.000 hectares**
- **Second main crop : Almond – 25.000 hectares**
- **The largest olive oil producer in Portugal**
- **The largest almond producer in Portugal**
- **The largest garlic producer in Portugal**
- **The largest melon producer in Portugal**

EXAMPLES OF CROPS IN ALQUEVA



EXAMPLES OF CROPS IN ALQUEVA



ALMOND

EXAMPLES OF CROPS IN ALQUEVA



NUTS

EXAMPLES OF CROPS IN ALQUEVA



POMEGRANATE

EXAMPLES OF CROPS IN ALQUEVA



FRUITS

EXAMPLES OF CROPS IN ALQUEVA



CORN

EXAMPLES OF CROPS IN ALQUEVA



ONION AND GARLIC

EXAMPLES OF CROPS IN ALQUEVA



VINEYARDS

EXAMPLES OF CROPS IN ALQUEVA



SUNFLOWER

EXAMPLES OF CROPS IN ALQUEVA



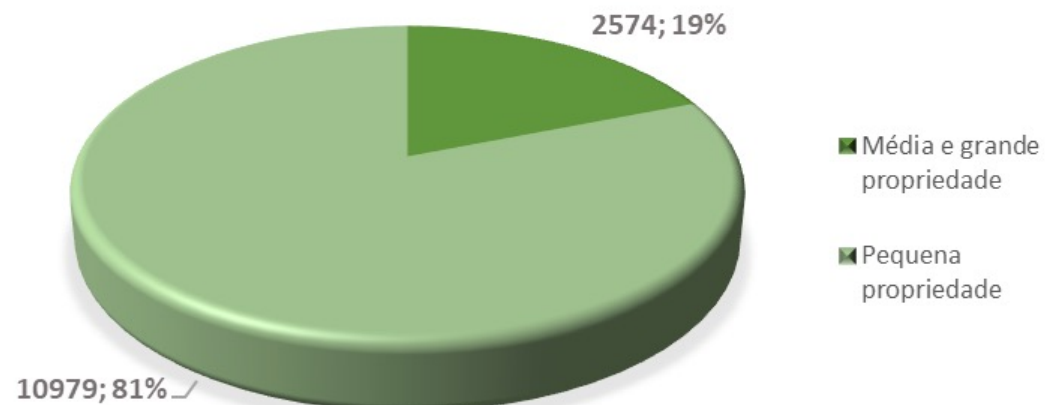
MELON AND WATERMELON

THE IMPACT ON LAND VALUATION

Nº prédios indemnizados/expropriados por tipo de propriedade

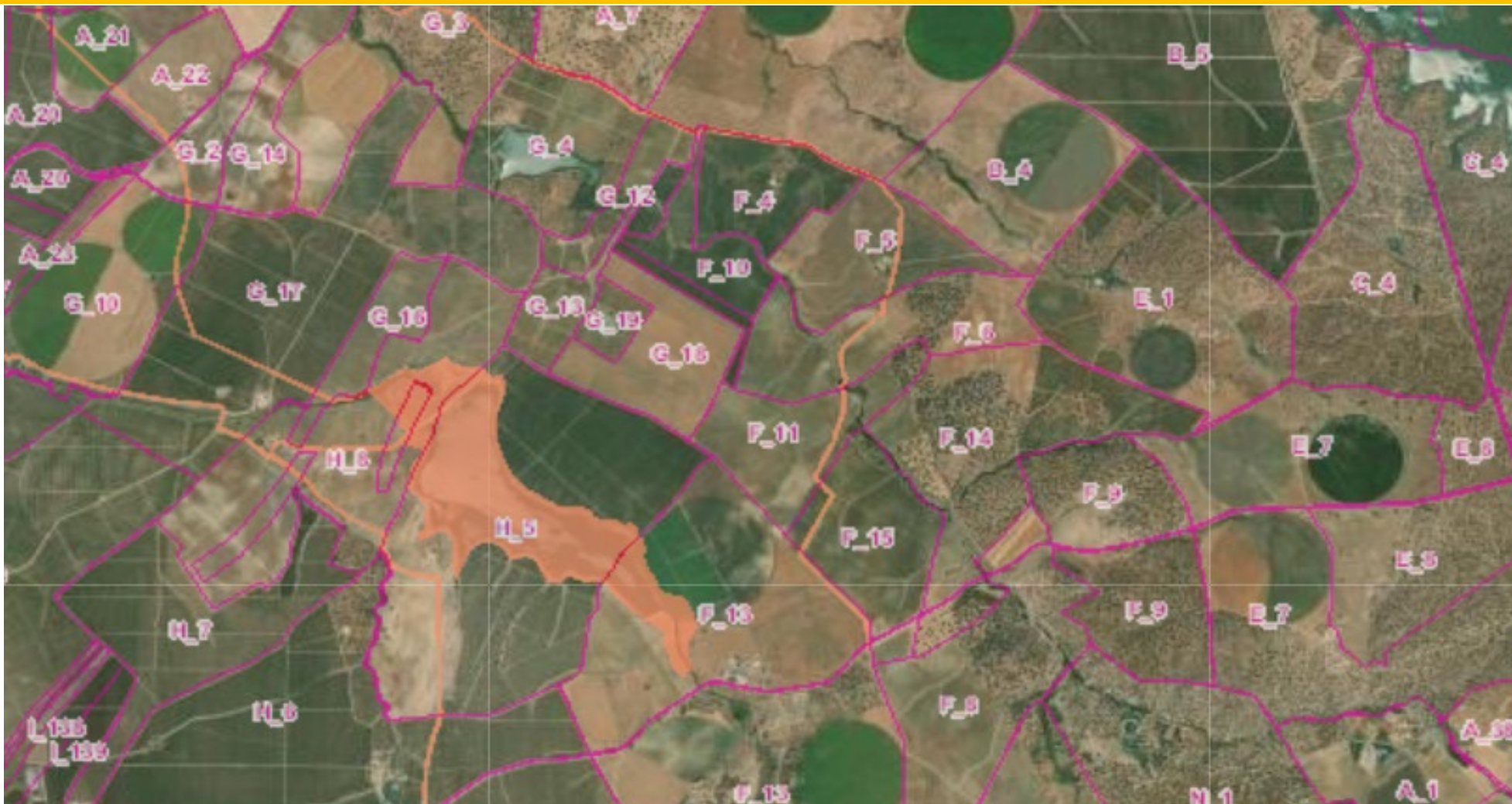
Tipo de propriedade	Nº prédios
Média e grande propriedade	2574
Pequena propriedade	10979
	13553

Nº prédios indemnizados/expropriados por tipo de propriedade



INTERVENED AREAS

THE IMPACT ON LAND VALUATION



MEDIUM AND LARGE AREAS

THE IMPACT ON LAND VALUATION

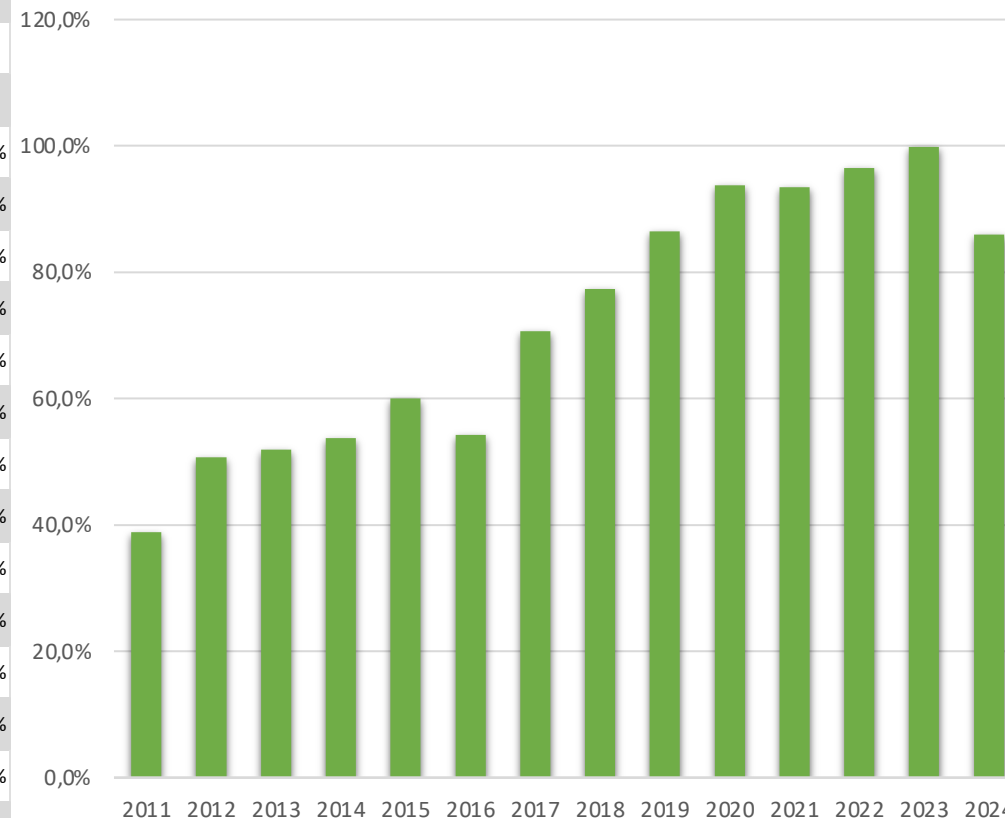
Ano	Total (ha)	Média e grande propriedade (ha)	Pequena propriedade (ha)	Média e grande propriedade (%)	Pequena propriedade (%)
2008	7833	7254	579	93%	7%
2009	18039	14181	3859	79%	21%
2010	37697	28753	8944	76%	24%
2011	46414	35657	10757	77%	23%
2012	50215	39424	10791	79%	21%
2013	60698	47539	13159	78%	22%
2014	60987	47828	13159	78%	22%
2015	80337	65674	14663	82%	18%
2016	109536	90478	19058	83%	17%
2017	109536	90478	19058	83%	17%
2018	109536	90478	19058	83%	17%
2019	109536	90478	19058	83%	17%
2020	109536	90478	19058	83%	17%
2021	115289	96104	19185	83%	17%
2022	119883	100615	19269	84%	16%
2023	119883	100615	19269	84%	16%
2024	119883	100615	19269	84%	16%

EQUIPPED AREA

THE IMPACT ON LAND VALUATION

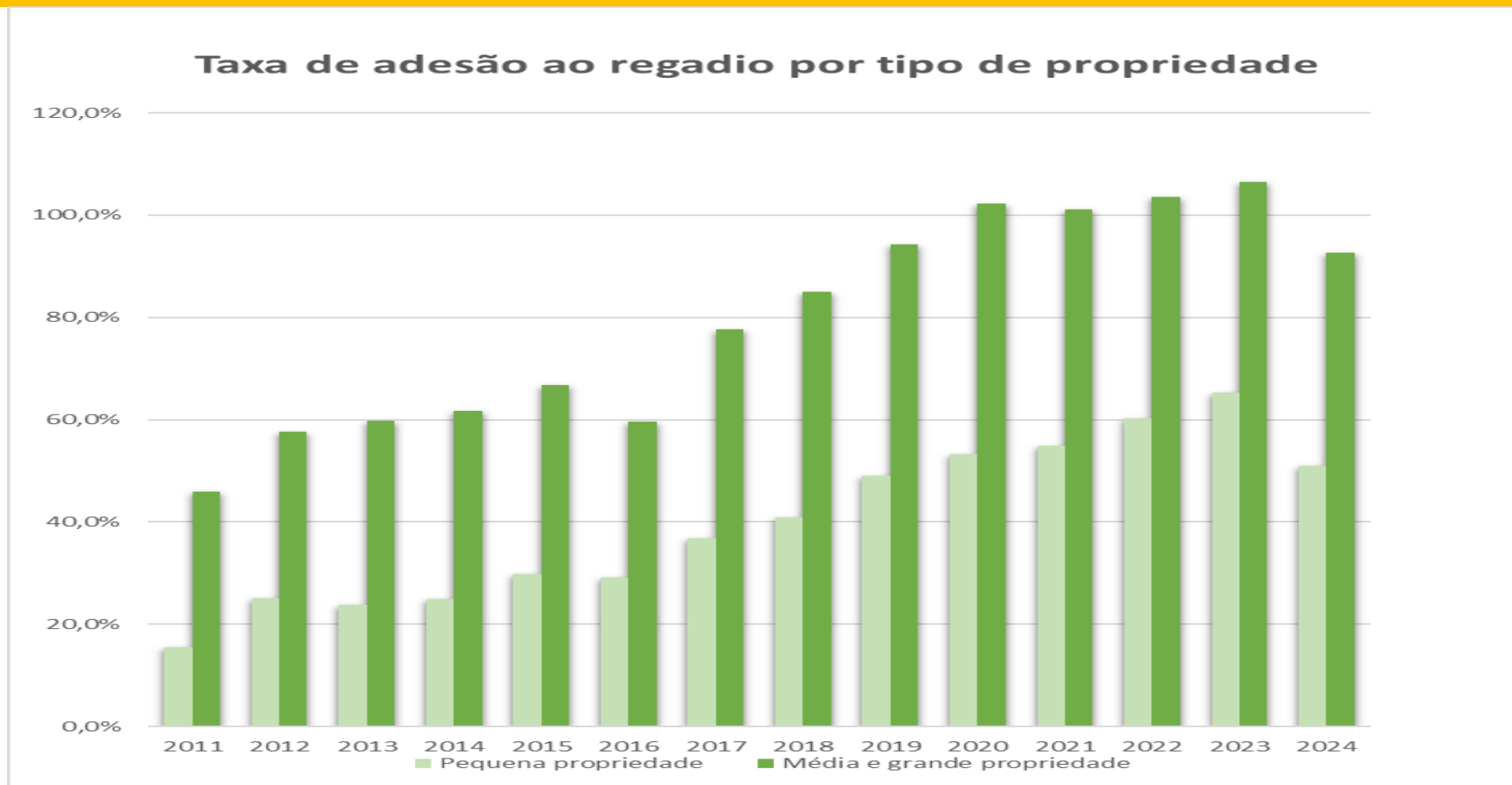
	tal (ha)	Adesão (%)	Média e grande propriedade (ha)	Pequena propriedade (ha)	Média e grande propriedade (%)	Pequena propriedade (%)
2008	-	-	-	-	-	-
2009	-	-	-	-	-	-
2010	-	-	-	-	-	-
2011	18020	39%	16359	1662	91%	9%
2012	25449	51%	22743	2707	89%	11%
2013	31542	52%	28419	3123	90%	10%
2014	32806	54%	29527	3280	90%	10%
2015	48229	60%	43863	4365	91%	9%
2016	59442	54%	53895	5547	91%	9%
2017	77353	71%	70342	7011	91%	9%
2018	84726	77%	76950	7777	91%	9%
2019	94698	86%	85369	9330	90%	10%
2020	102715	94%	92555	10160	90%	10%
2021	107725	93%	97190	10536	90%	10%
2022	115742	97%	104140	11602	90%	10%
2023	119653	100%	107084	12568	89%	11%
2024	103075	86%	93253	9822	90%	10%

Taxa de adesão ao regadio

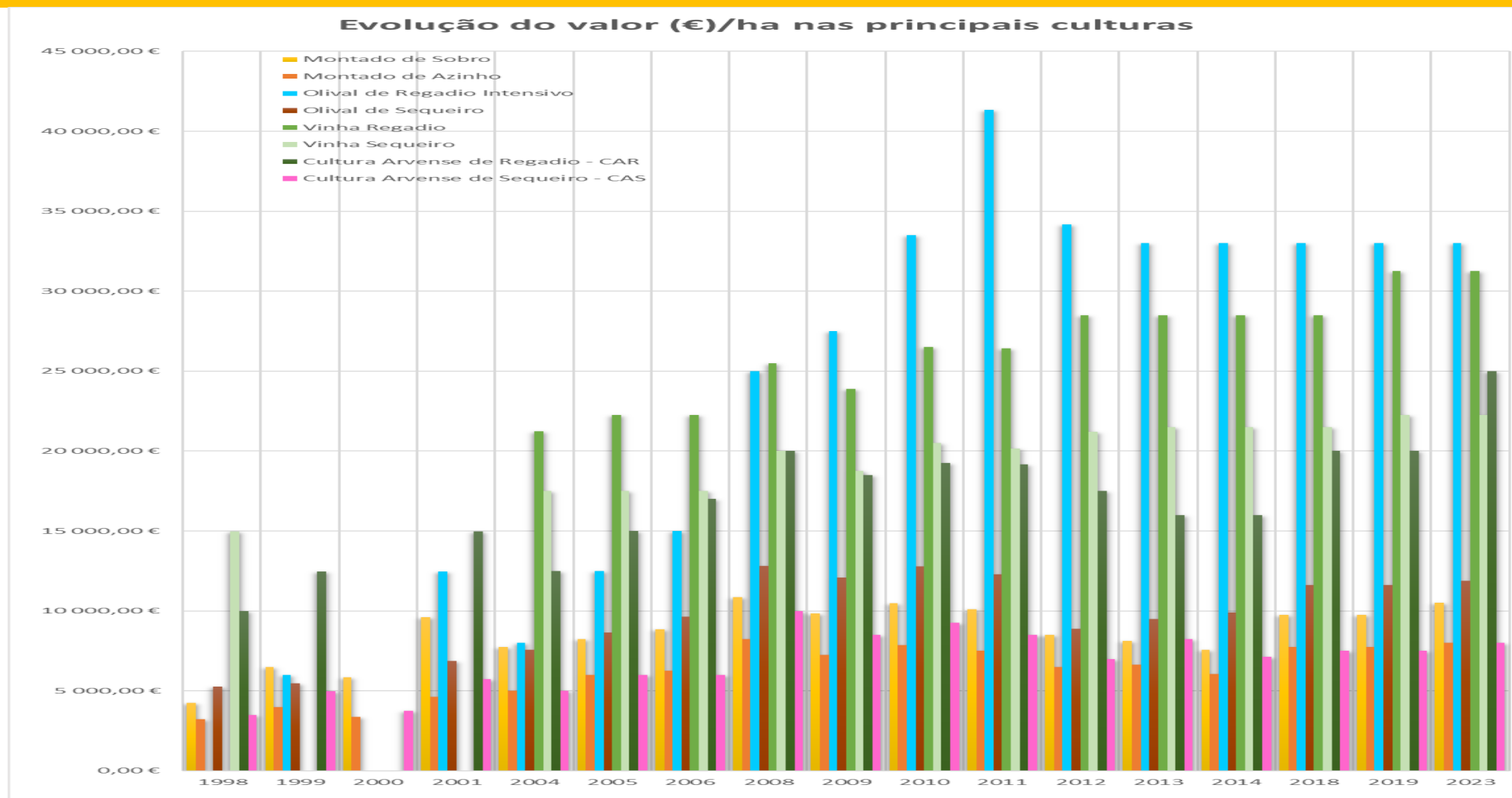


ADHESION TO IRRIGATION

THE IMPACT ON LAND VALUATION

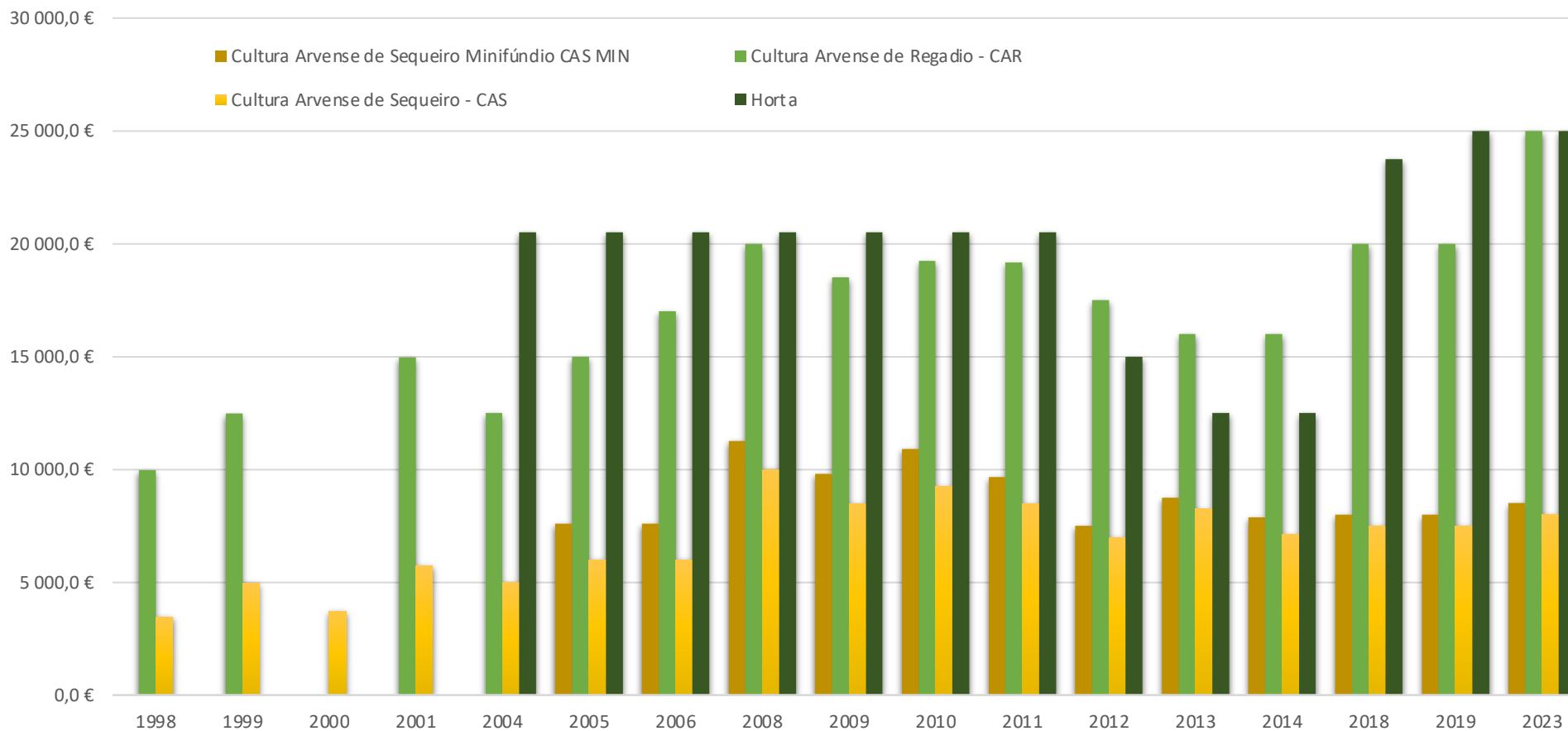


THE IMPACT ON LAND VALUATION



THE IMPACT ON LAND VALUATION

Evolução do valor (€)/ha em culturas arvenses de sequeiro e de regadio



THE IMPACT ON LAND VALUATION

Evolução do valor (€)/ha em olival de sequeiro e de regadio



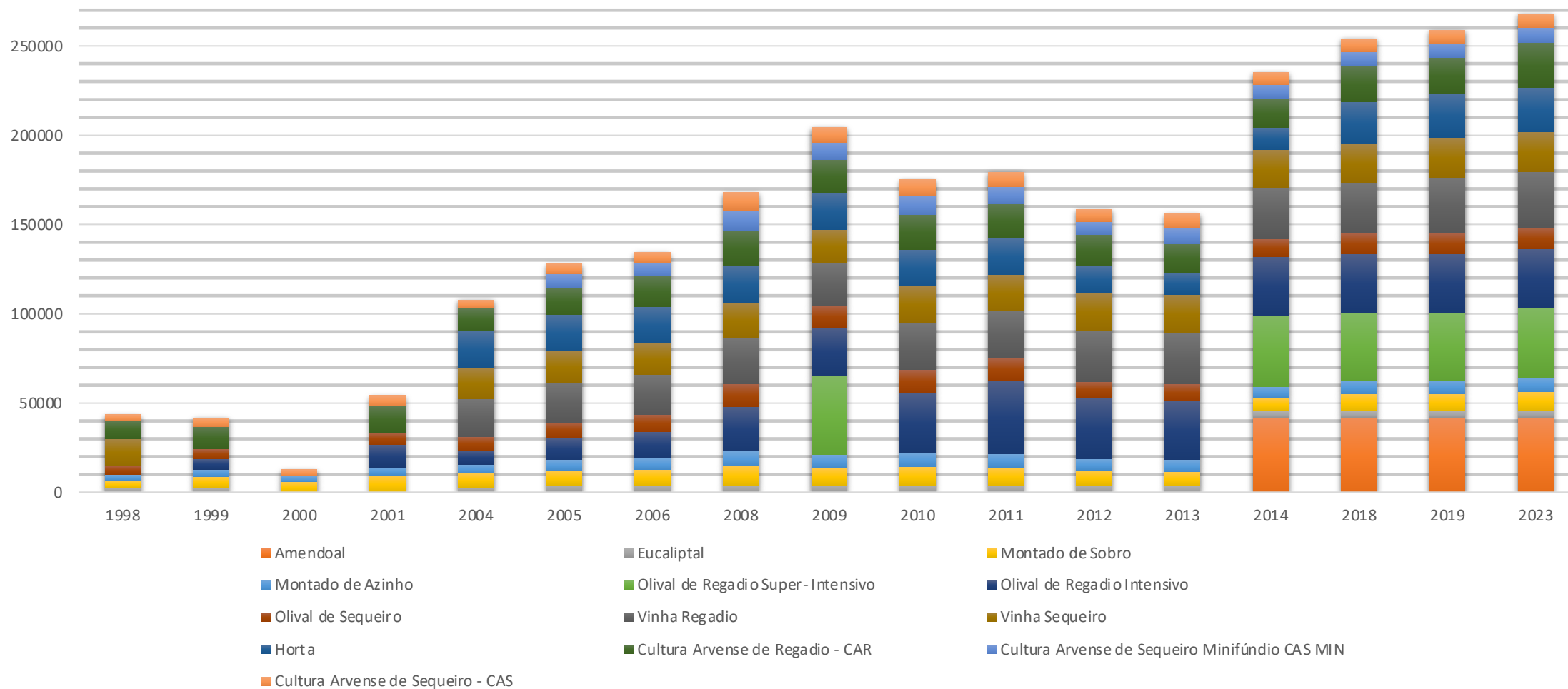
THE IMPACT ON LAND VALUATION

Evolução do valor (€)/ha em montado de sobro e azinho



THE IMPACT ON LAND VALUATION

Evolução acumulada do valor (€)/ha por ocupação cultural



DETAILED KNOWLEDGE OF ALQUEVA TERRITORY



Empresa de desenvolvimento e Infra-Estruturas do Alqueva, S. A.

Alvito-Pisão | Faro

Campanha de Rega de 2013

Beneficiário

Nome: Francisco dos Prazeres Zorrinho Cardoso NIF: 104519711
Morada: Herdade das Pias, Apartado 71
Código Postal: 7940-909 Localidade: Cuba
Telemóvel: Telefone: Fax: E-mail:
Documento de Identificação: Cartão de Cidadão Número: 00215030 Validade: 06-05-2014

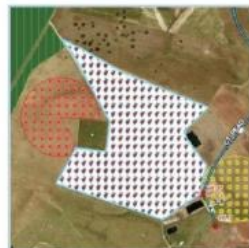
Representante

Nome: Nuno Manuel Pessanha Cardoso NIF: 179105981
Morada: R D Frei Manuel do Cenáculo N.8
Código Postal: 7800-052 Localidade: Beja
Telemóvel: Telefone: 93-4530868 Fax: E-mail:
Documento de Identificação: Número: Validade:

Observações:

Área Inscrita - Herdade das Pias

Concelho: Cuba
Freguesia: Faro do Alentejo
Secção: C Artigo: 158 Nº de Cadastro: 0490.158
Relação Prédio Beneficiário: Outro
Sistema de Rega: Gota-a-gota Cultura: Uva para vinho
Área do prédio: 119,43 ha
Área inscrita: 33,34 ha Dentro do Perímetro: S
Data inscrição: 13-05-2013
Observações:



11-06-2013

Sede: Rua Zeca Afonso, 2 7800-522 Beja Telefone: 284315100 Fax: 284315121

1 / 3



OPERATING MANAGEMENT - SISAP

Data Base

Soil chart

Slope chart

Cultivation accounts

Price

Carbon and energy balance

Weather reporting

Crop requirements

pH, conductivity, texture,
hydromorphism

Slopes

Minimum temperature, maximum
temperature, rainfall cycles, hours of cold
weather

SUPPORT TO DETERMINE THE SUITABILITY OF THE SOIL FOR CROPS



This support consists of providing a letter with the suitability of the soil for the crops chosen by the Farmer in a certain área, making the technical, economic and environmental verification of its sustainability.



It is an instrument to help farmers in their decision.

TELEMANAGEMENT CENTRE



TELEMANAGEMENT CENTRE



FARMER`S WEB PORTAL



Meteorologia

Estação de Beja (Quinta da Saúde)

[\(Aceda aqui para ver mais estações\)](#)

Hoje, 13 abr



Máx: 20 °C
Min: 3 °C
Vento: 16km/h
Prec: 0 mm
ETO: 4,4 mm

sexta-feira



Máx: 21 °C
Min: 2 °C
Vento: 11km/h
Prec: 0 mm
ETO: 3,9 mm

sábado



Máx: 27 °C
Min: 6 °C
Vento: 11km/h
Prec: 0 mm
ETO: 5,0 mm

Últimos 7 dias

	qui	sex	sáb	dom	seg	ter	qua	Total
Máx:	29 °C	28 °C	30 °C	30 °C	28 °C	26 °C	--	

Estatísticas

Água fornecida aos
regantes

388,4 M
m3

Comunidade de Regantes

FARMER`S WEB PORTAL

Informação EDIA

Ligações úteis

Destques

[Anuário Agrícola de Alqueva 2022](#)

[Ver todos os destaques](#)

Documentos

[BOLETINS DE QUALIDADE ÁGUA - 2022](#)

[BOLETINS DE QUALIDADE ÁGUA - 2021](#)

[Requisitos Ambientais nos AH](#)

[Guia de Boas Práticas Agroambientais](#)

[Ver todos os documentos](#)

Ajuda rápida

Perguntas Frequentes

Qual a documentação necessária para a inscrição?

O que tenho de fazer para ter acesso à água?

Como posso saber o caudal que terei disponível?

Tenho de efetuar uma inscrição todos os anos?

[ver mais](#)

São necessários:

- cartão de cidadão;
- caderneta predial;
- certidão comercial, cópia NIPC (no caso de pessoa coletiva).

Caso seja rendeiro, será necessário apresentar ainda o contrato de arrendamento.

ALQUEVA: CHALLENGES IN THE CONTEXT OF CLIMATE CHANGES

- **Circular economy; URSA; Pla coals; water reuse.**
- **Agro-energy transition; photovoltaic in water (>60MW); user community; self-consumption; tertiary network.**
- **Implementing electric mobility; charging stations**
- **Surface water resources; regularization; water lines; bodies of water; quality; ecological flows**
- **Preservation of aquifers; minimization of extractions; monitoring; recharge.**
- **Water and energy efficiency; precision irrigation; optimization of networks and equipment; reduction of losses and overuse; Contingency plan.**

ALQUEVA: CHALLENGES IN THE CONTEXT OF CLIMATE CHANGES

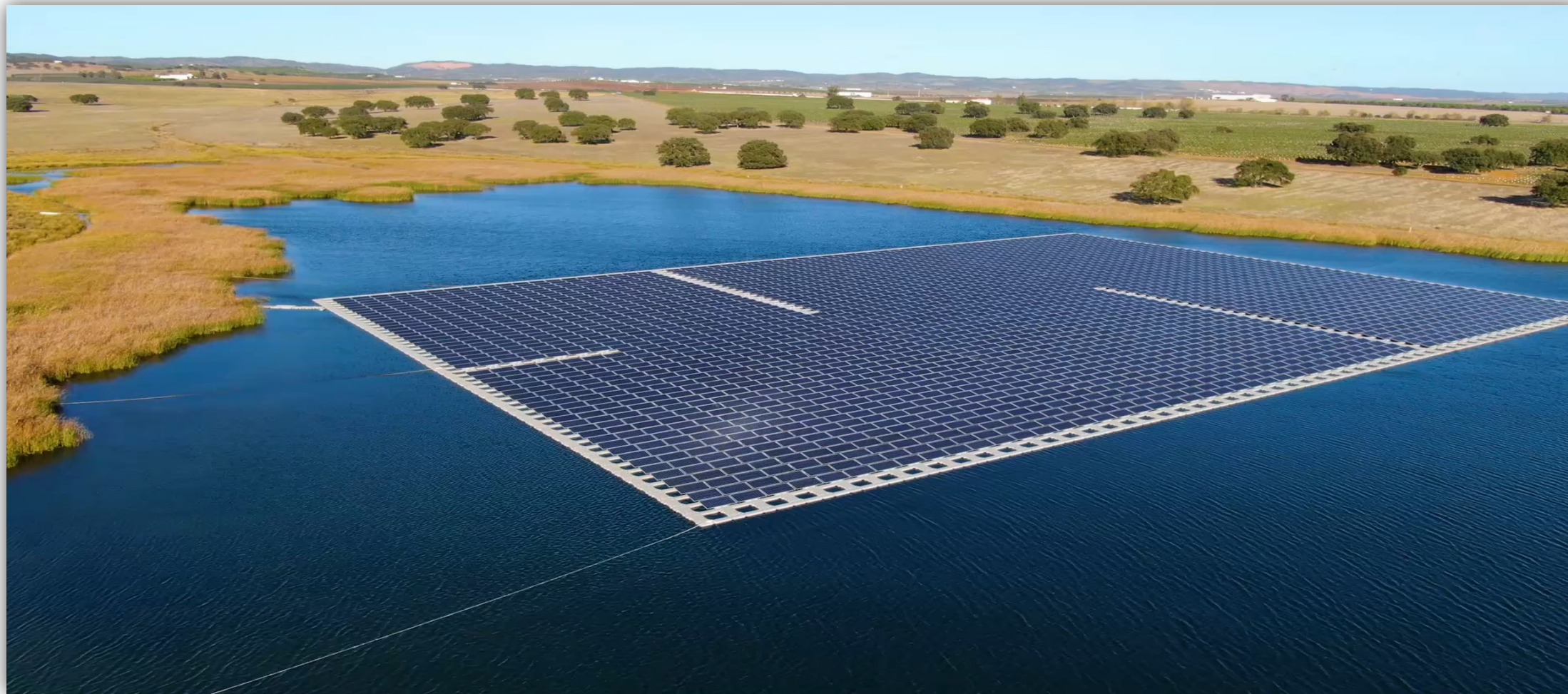
- **Biodiversity; discontinuation hedges; Biodiversity ranges (accessibility, watercourses and marc areas); preservation of threatened species.**
- **Carbon Neutrality; Quercinea planting areas (surplus/ trips surrounding the reservoirs with assisted irrigation; green barriers.**
- **Nature Parks; In EFMA reservoirs with interventions to improve the quality of the water mass with bird observation stations, crop niches that are more common to showcase good agro-environmental practices, areas for the requalification of Mediterranean forests, clean energy displays, with requalification riparian gallery and recovery of fishing areas, nature trails and cycle paths and recreational activities (e.g. bathing) and environmental pedagogy with the promotion of electric mobility.**
- **Cooperation - Environment, Heritage, Spatial Planning; Protocols for i) strengthening cooperation with SEPNA; ii) cooperation/technical support for local authorities (PDM; GIS orthophoto maps; registration, e.g.)**

SOLAR FLOATING PHOTOVOLTAIC PROJECT IN ALQUEVA



Project to install floating power units with 70 MW total power

PHOTOVOLTAIC ENERGY PRODUCTION FOR SELF-CONSUMPTION





FINAL CONSIDERATIONS

- Alqueva is a dam that created a **strategic water reserve** at national level and that constituted a catalyzing and transforming agent for a desertified and depressed region.
- The complexity, size and scope of the Alqueva Multi-Purpose Development makes it a reference and case study at national and international level, particularly in the context of climate change, among Portuguese-speaking, Ibero-American and Mediterranean countries.
- **EDIA – Empresa de Desenvolvimento e infra-Estruturas de Alqueva based in Beja** - was created in 1995 with the mission of designing, executing, building and exploring the Alqueva Multi-Purpose Project (EFMA), contributing to the promotion of economic and social development of its area of intervention, which corresponds to 21 municipalities in the districts of Beja, Évora, Portalegre and Setúbal.
- The completion of the 1st phase of this major development occurred around ten years before the initially scheduled date and during a period of great economic fragility in the country.

FINAL CONSIDERATIONS

- The “water, energy and food” nexus - which is in the equation all over the world in the current turbulent international political context - can make decisive contributions in solutions like Alqueva's - even through the possibility of hybrid solutions at an energy level and autonomous response in these sectors essential to life.
- The environmental and heritage identification, minimization and compensation work and monitoring were of great scope and demand, providing a very important collection of knowledge from the entire area of influence of Alqueva.
- Alqueva as a transformative project is a living entity with permanent new challenges and constant learning.

