



Building dams in Portugal: a solution for marginalized territories?

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Questions I've been asked

- How does the relationship between people and water shape rural areas and the challenges that rural communities currently face?
- How do different narratives of water shape/drive sustainable behaviour and climate action and adaptation in rural areas?
- Are there specific challenges about water that are particularly about rural areas or that are more salient for rural areas?
- What role does water play in the development, transformation, and in the configuration of the identity of rural communities?



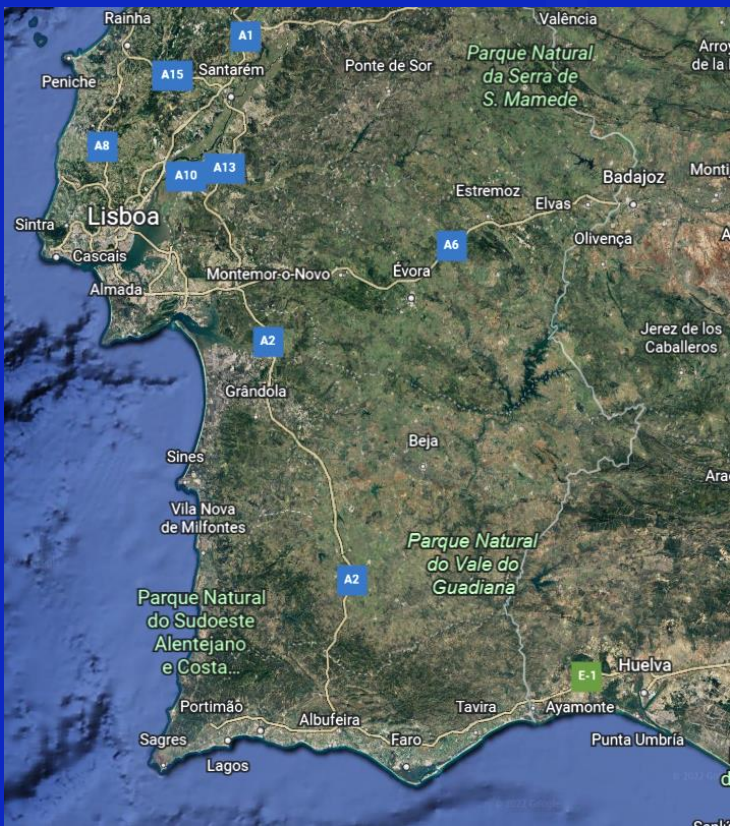
Since the middle ages, keeping people in rural areas and agricultural activities had been a subject of state policies:

- There were laws and public policies meant to keep the population on the countryside using all sorts of arguments,
- territory defense and military occupation,
- food self-supply,
- state autonomy and independence.





Alentejo



Southern region in Portugal, occupies 41% of the territory

Only 7% of the population of Portugal

Extensive agriculture until the XIXth century, latifundia model

Low rainfall, long periods of draught

Cronical water shortage

Dams: a solution to all the problems of Alentejo?

The Agrarian Question

Alentejo was supposed to provide cereals to feed the entire country:

- Many scholars wrote about this throughout the centuries, particularly since the seventeenth century (Almeida 2020)
- Soares de Barros, the author who introduced demography in Portugal, wrote in 1789 that this region should be “Portugal’s granary some day” (Barros, 1990; Santos, 1993)

Problems:

- Water and people shortage

Solution:

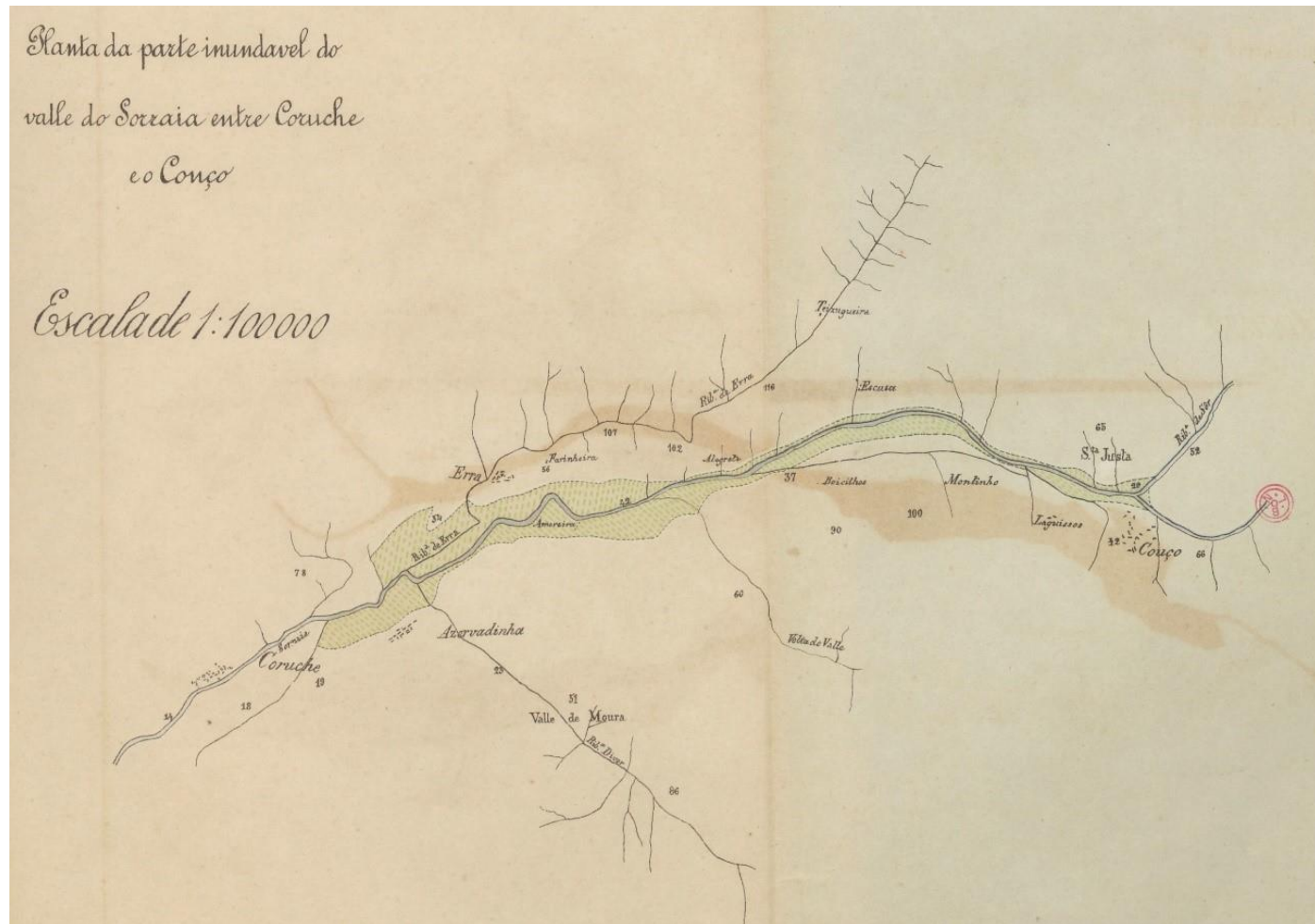
- Dams and irrigation plans
- Internal colonisation
- Land division

However,

- People kept abandoning rural areas whenever they could
- Portugal was never self-sufficient in food supplies, particularly cereals.



Construction plans for the Vale do Sorraia Dam in 1884



Source: Portugal. Ministério das Obras Públicas, Commercio e Industria, 1884.

Public policies for the rural world:

1. Wheat campaigns
2. Internal colonization
3. Agricultural hydraulic systems
4. Reforestation

Deregulating the balance and the ecosystem!



Wheat Campaign





1950:

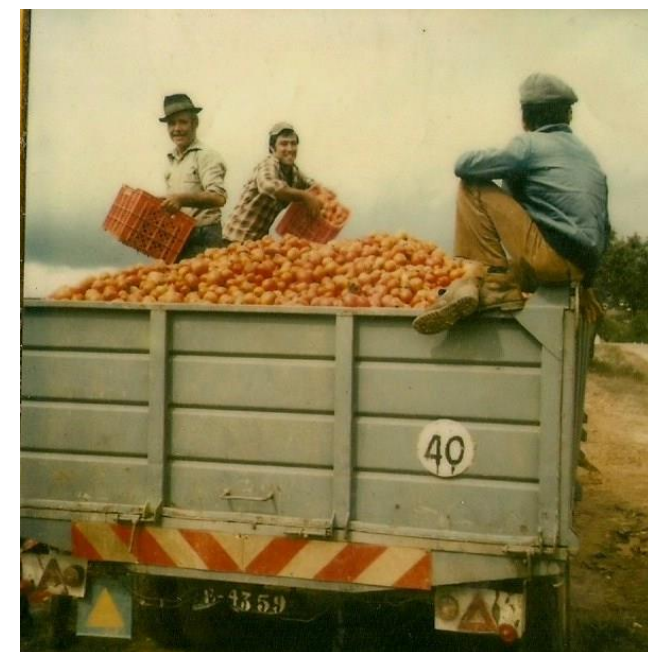
In the second half of the twentieth century several changes were introduced which encouraged and resulted in mass migration.

- Agricultural related industries, such as tomato.
- Huge investments in hydroelectric dams for the production of electricity, for industry and for water reserves for agriculture.
- Forestation of wastelands to supply raw materials to new industries: sawmills, resins and paper.



1960: rural exodus, farm machines and industry

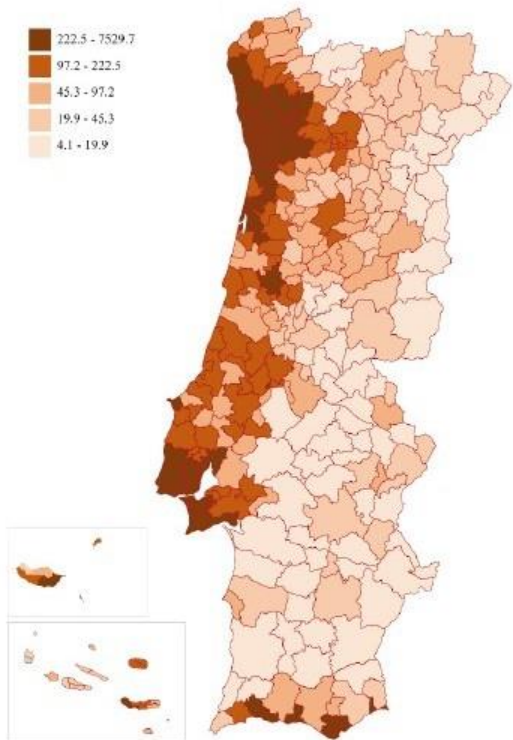
- Introduction of social benefits and early welfare laws
- Industrialization and construction works in the outskirts of Lisbon and Oporto attracted rural labourers to better paid jobs
- Emigration to other European countries, particularly France, Luxemburg, Switzerland and Germany. Over a million Portuguese people helped rebuild France after World War II and stayed there.
- Search for better life and working conditions
- An escape from the Colonial War
- Higher wages in agriculture
- Renters
- A new class of entrepreneurs: machines and tomato croppers
- Fences for herds, less shepherds
- End of transhumance
- As Lisbon was losing 31.7% of its population and Porto 21.7%, their suburban areas, now a part of the larger Lisbon's and Porto's metropolitan areas, were growing exponentially, as well as a few other industrial towns.



THE PROBLEM

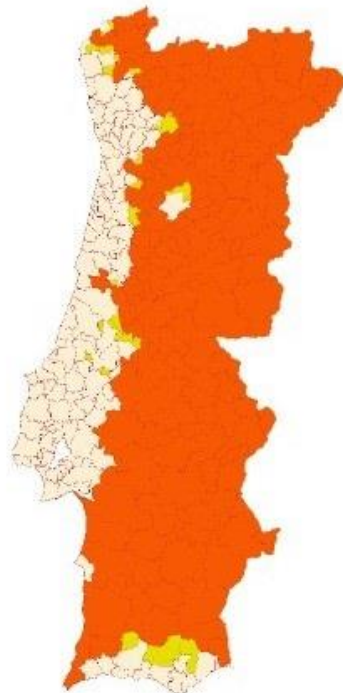
20% of the population in
80% of the territory
Aging population
Environment issues

Areas classified as interior regions in 2017:



Source: Pordata (www.pordata.pt/Municipios/Densidade+populacional-452). Accessed 10 January 2019.

Figure 1: Map of population density in Portuguese municipalities: Average number of residents per square kilometre, 2017.



Source: Programa Nacional para a Coesão Territorial (National Programme for Territorial Cohesion) – Implementação, Acompanhamento e Monitorização, p. 98. (www.portugal.gov.pt/pt/jc21/governo/programa/programa-nacional-para-a-coesao-territorial-/ficheiros-coesao-territorial/programa-nacional-para-a-coesao-territorial-implementacao-acompanhamento-e-monitorizacao-pdf.aspx).

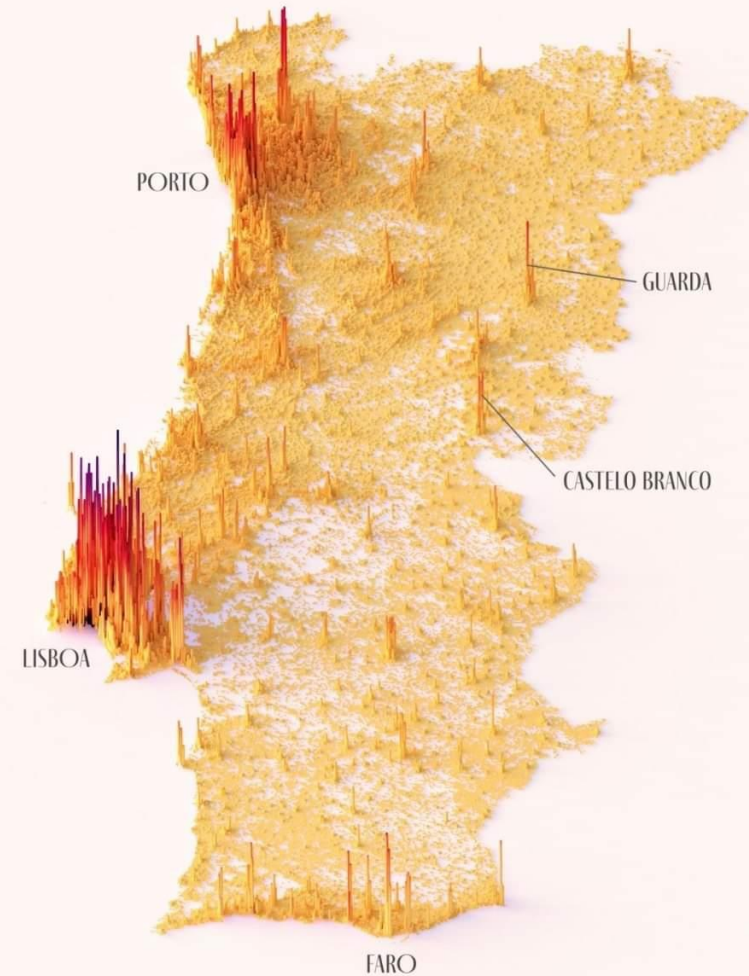
Figure 2: Map of the geographic limits of the Portuguese areas classified as interior

POPULATION DENSITY MAP

PORTUGAL

VISUALISED BY @TERENCE@FOSSTODON.ORG/@RESEARCHREMORA
IN #RSTATS WITH RAYSHADER (@TYLERMORGANWALL)

KONTUR POPULATION 2022



Depopulation:

- Sharp reduction in the size of the population in interior municipalities
- Weakened the social structure and foundation of the rural population
- The loss of these regions' productive role and active population has decreased their social, economic and political significance.
- Depopulation brings out frailties. People are unprotected, alone, with restricted access to health services, education, communication, security. Poor internet and phone services, poor water quality.

Dams and irrigated areas in Portugal, 2022

Source: Direção Geral de Agricultura e Desenvolvimento Rural e Empresa de Desenvolvimento e Infra-estruturas do Alqueva.

Region	Number of dams	Irrigated land (hectares)	Irrigated land (acres)	Average área of dams (hectares)	Average área of dams (acres)
North	16	9,017	22,272	564	1,393
Centre	14	31,636	78,141	2,260	5,582
Lisbon and Tagus Valley	8	22,458	55,471	2,807	6,933
Alentejo	20	176,12	43,500	8,806	21,750
Algarve	17	13,174	32,540	775	1,914
Total	75	252,402	623,433	3,365	8,311

Maranhão and Montargil Dams, 1959

The Valey of Sorraia irrigation project:

Managed by ARBVS – Association of beneficiaries of the Valley of Sorraia

Ocupies about 3,600 hectares (8,900 acres)

Waters 18,000ha (44,460 acres) of land througout 124km (77 miles) from the municipalities of Ponte de Sor and Avis, passing through Mora, Coruche, Salvaterra de Magos and Benavente, all the way to Vila Franca de Xira.

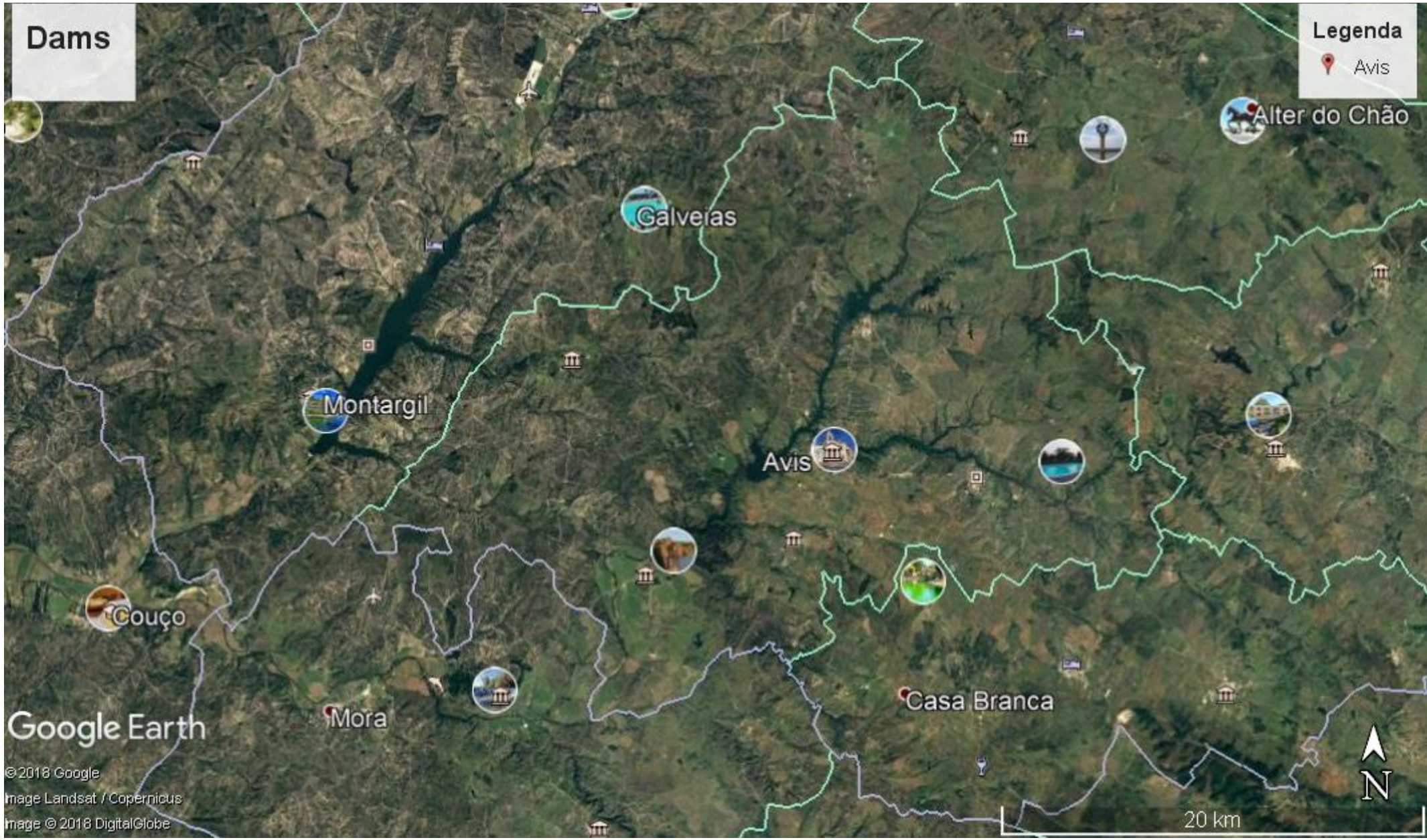
Irrigated products (2022):

- Rice (6,545ha / 16,166 acres)
- Intensive and superintensive olives (4,215ha / 10,411 acres)
- Corn (3,943ha / 9,740 acres)





Dams

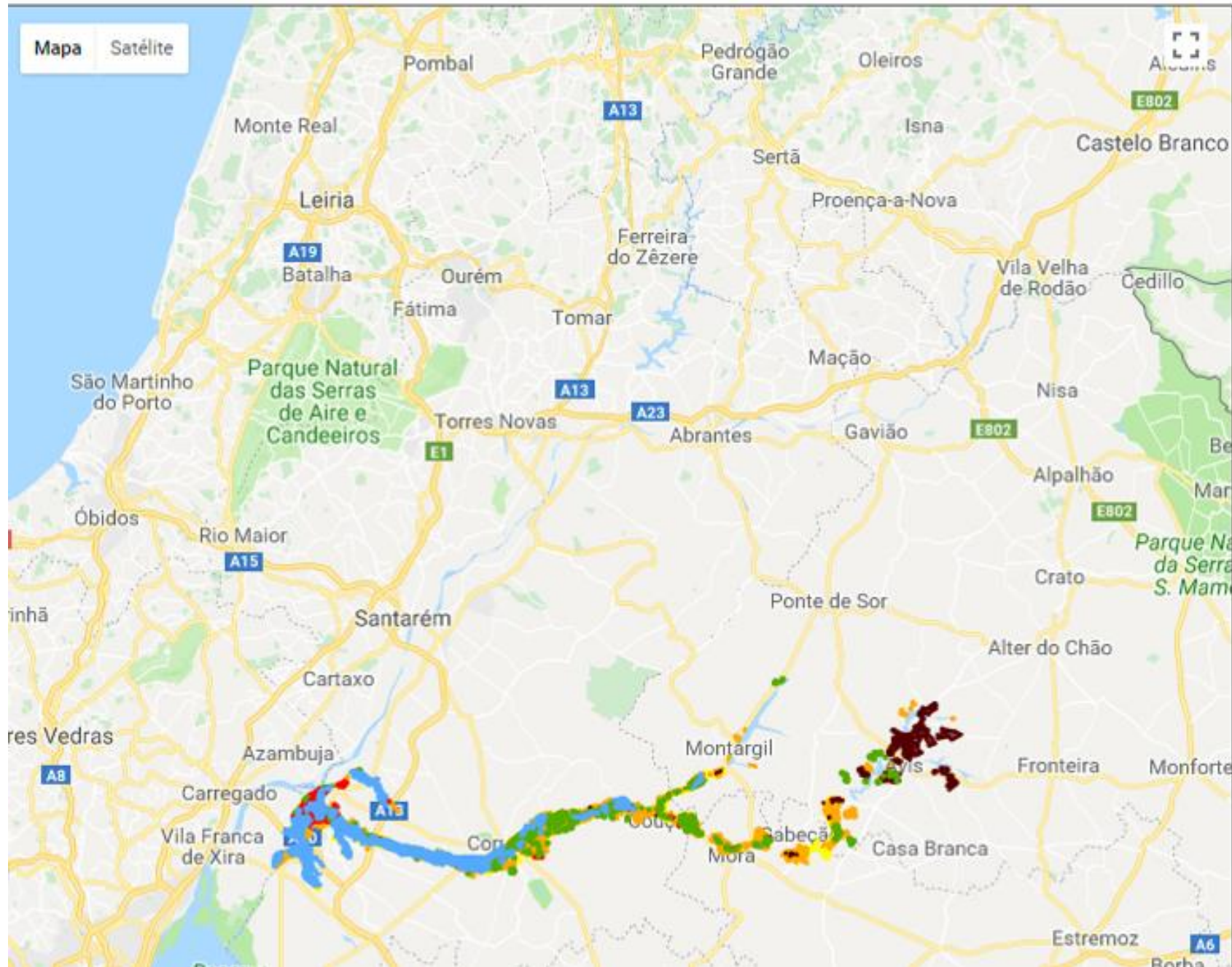


Google Earth

© 2018 Google
Image Landsat / Copernicus
Image © 2018 DigitalGlobe

Legenda da Carta Agrícola 2016:

Arroz Milho Olival Tomate O. Culturas Inculto

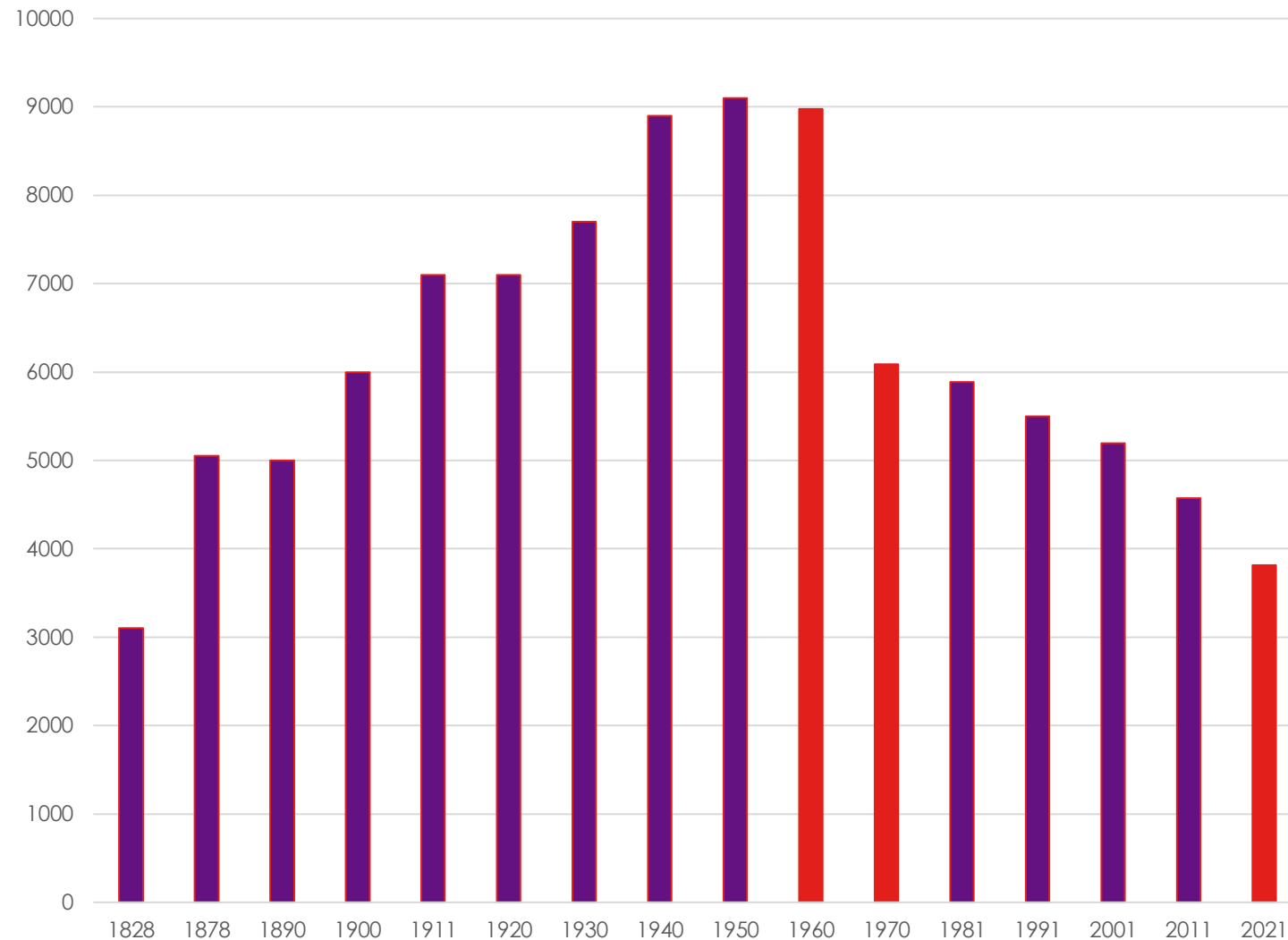


The Maranhão Dam: a case study in the municipality of Avis

In the municipality of Avis, the Maranhão Dam was inaugurated in 1959.

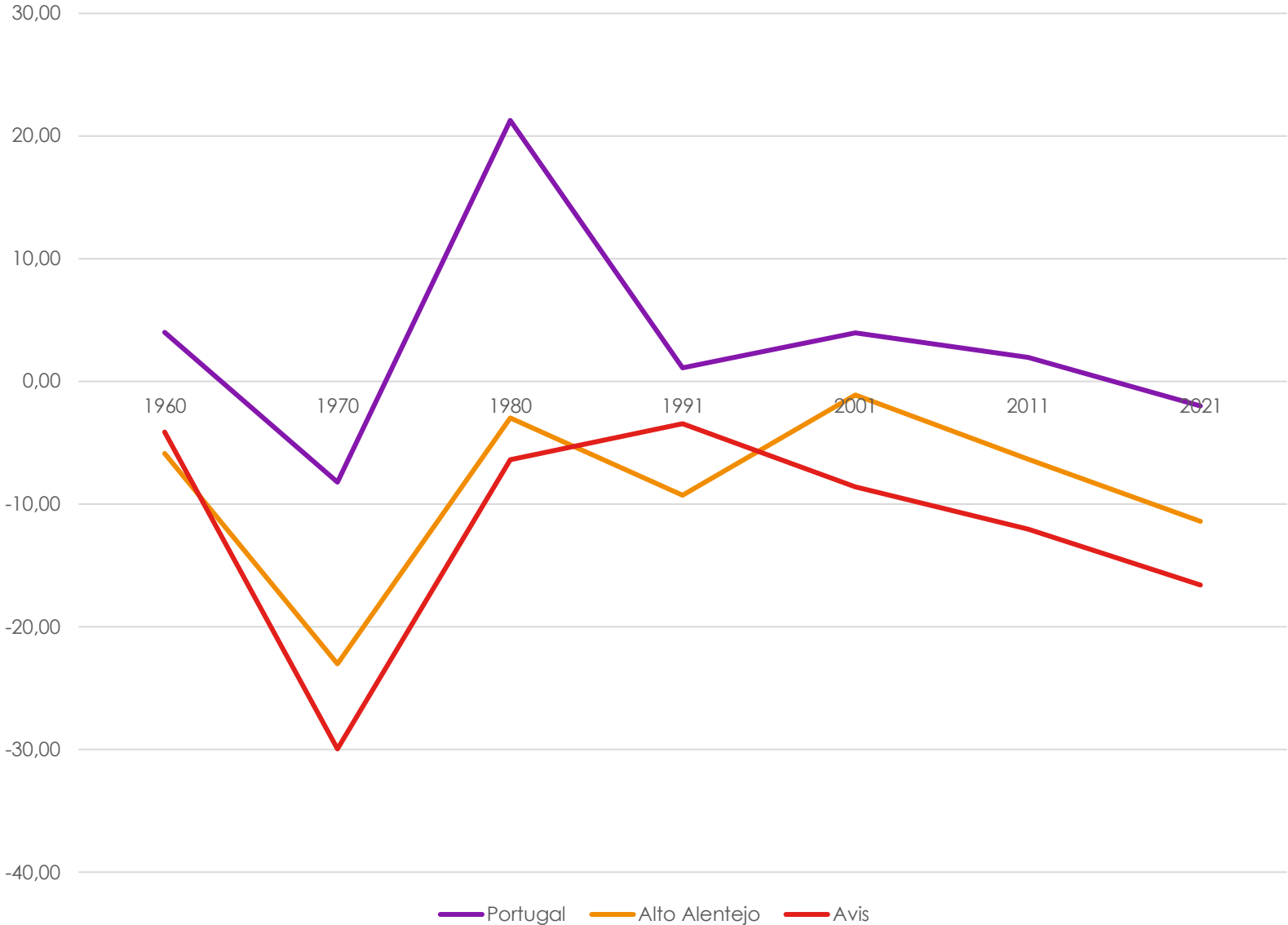
It was precisely on the next decade that it lost 1/3 of its population. And again 16.6 per cent from 2011 to 2021.

Avis Municipality: demographics



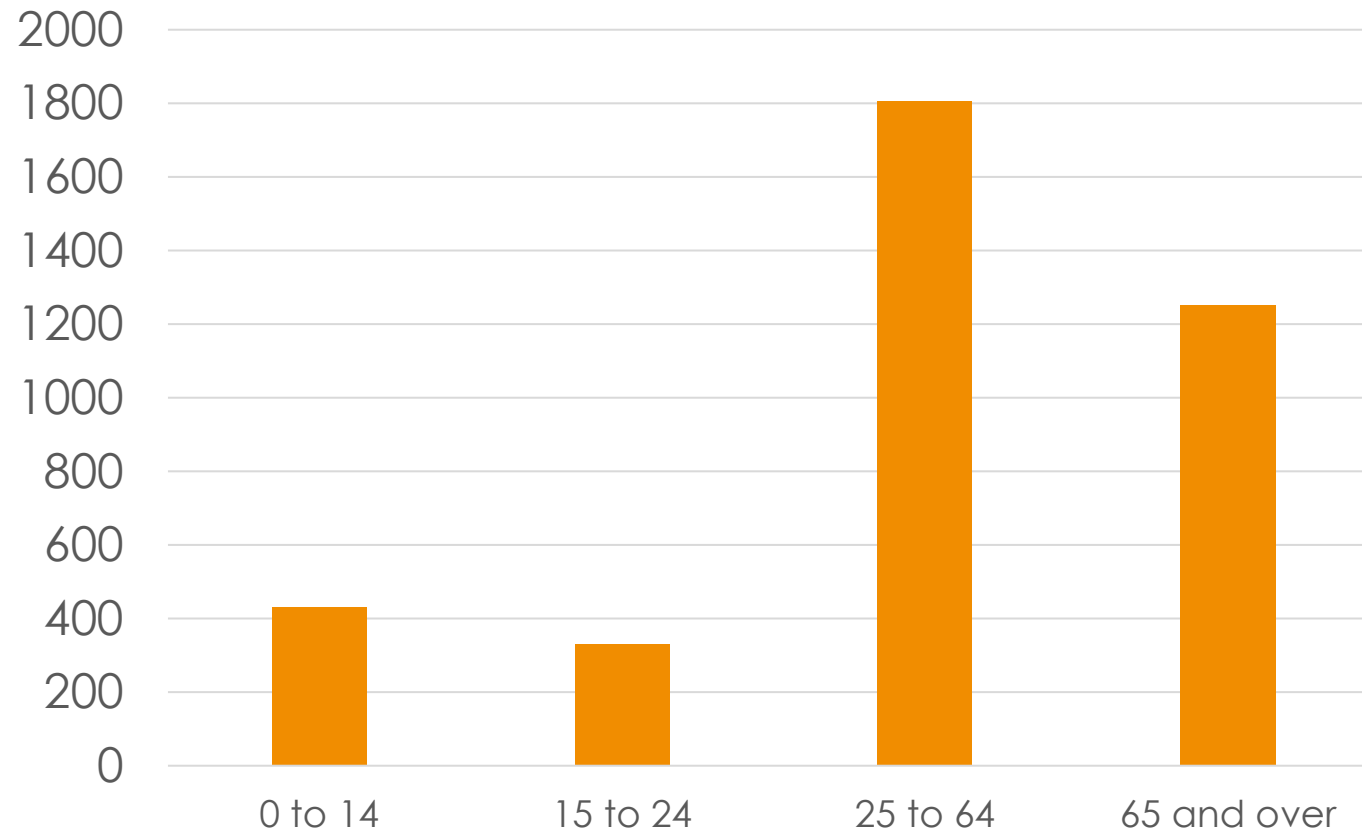
**Rate of change
(percentage) of
the population of
Portugal, North
Alentejo and Avis,
1960-2021.**

Source: Census (Almeida,
Faísca, Freire, 2023)



Avis: demographics and age groups in 2021

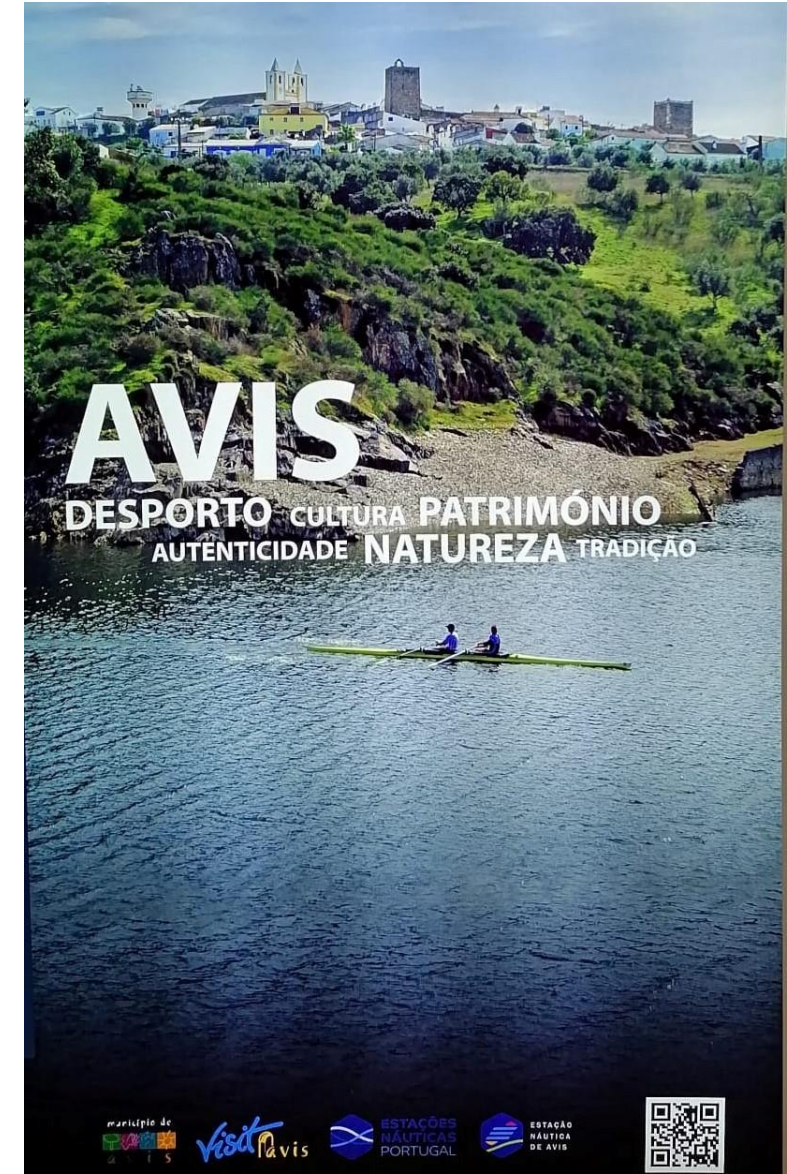
0 to 14	428
15 to 24	329
25 to 64	1805
65 and over	1250
Total	3812
2011-2021	-16,60%
Source: https://www.ine.pt/scripts/db_censos_2021.html	



The Portuguese rural territories after agriculture (Baptista, 2006):

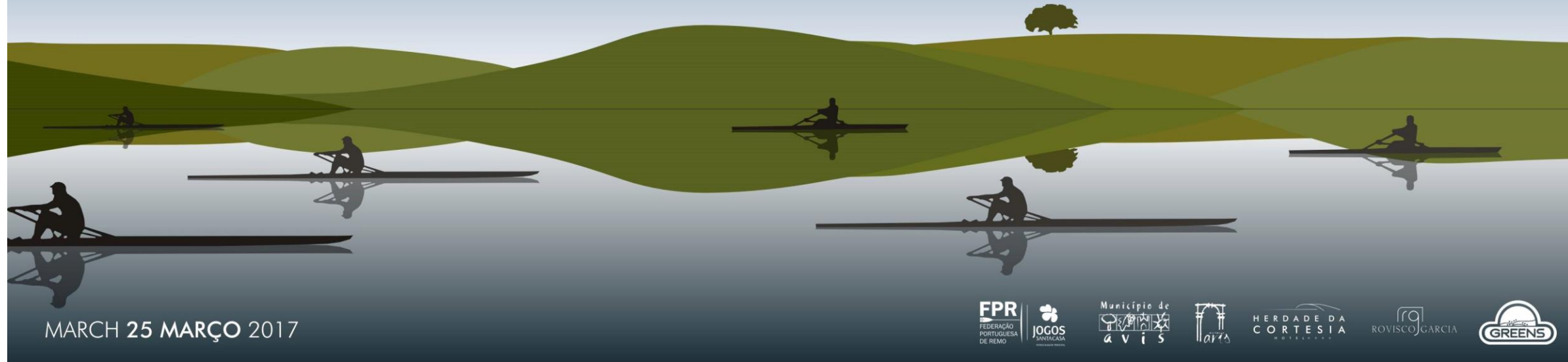
- Rural populations separated from agricultural activities in their territories.
- Other activities in rural areas:
 - Tourism
 - Hunting
 - Food.
- 3 types of agriculture:
 1. Highly competitive, specialized in fruits, wine and olive oil, fundamental for Portuguese exports, with low impact on local communities, low use of permanent labour, high use of seasonal labour.
 2. Based on livestock, corn and wheat, highly mechanized, low use of labour, completely dependent on European subsidies.
 3. Social agriculture, urban gardens, small size, a supplement to low pensions and unemployment. Some impact on community life and social relations.

Attraction strategies



AVIS HEAD OF THE CORK

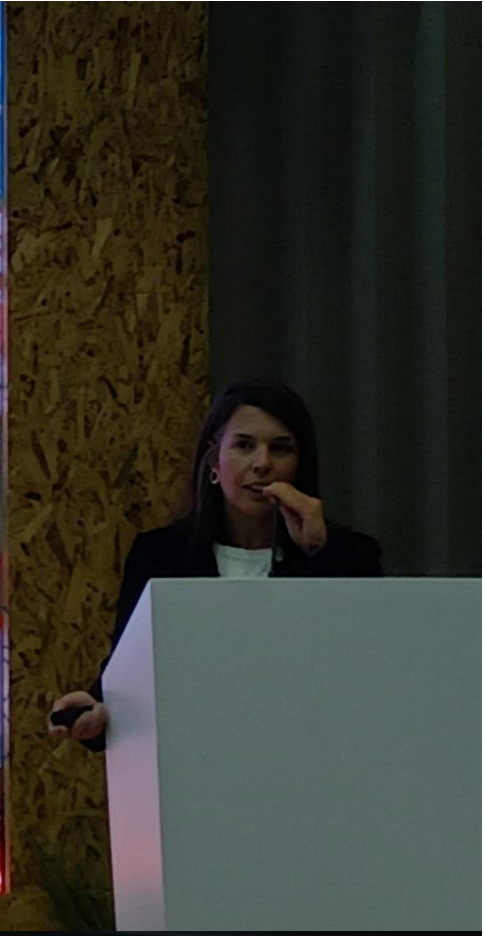
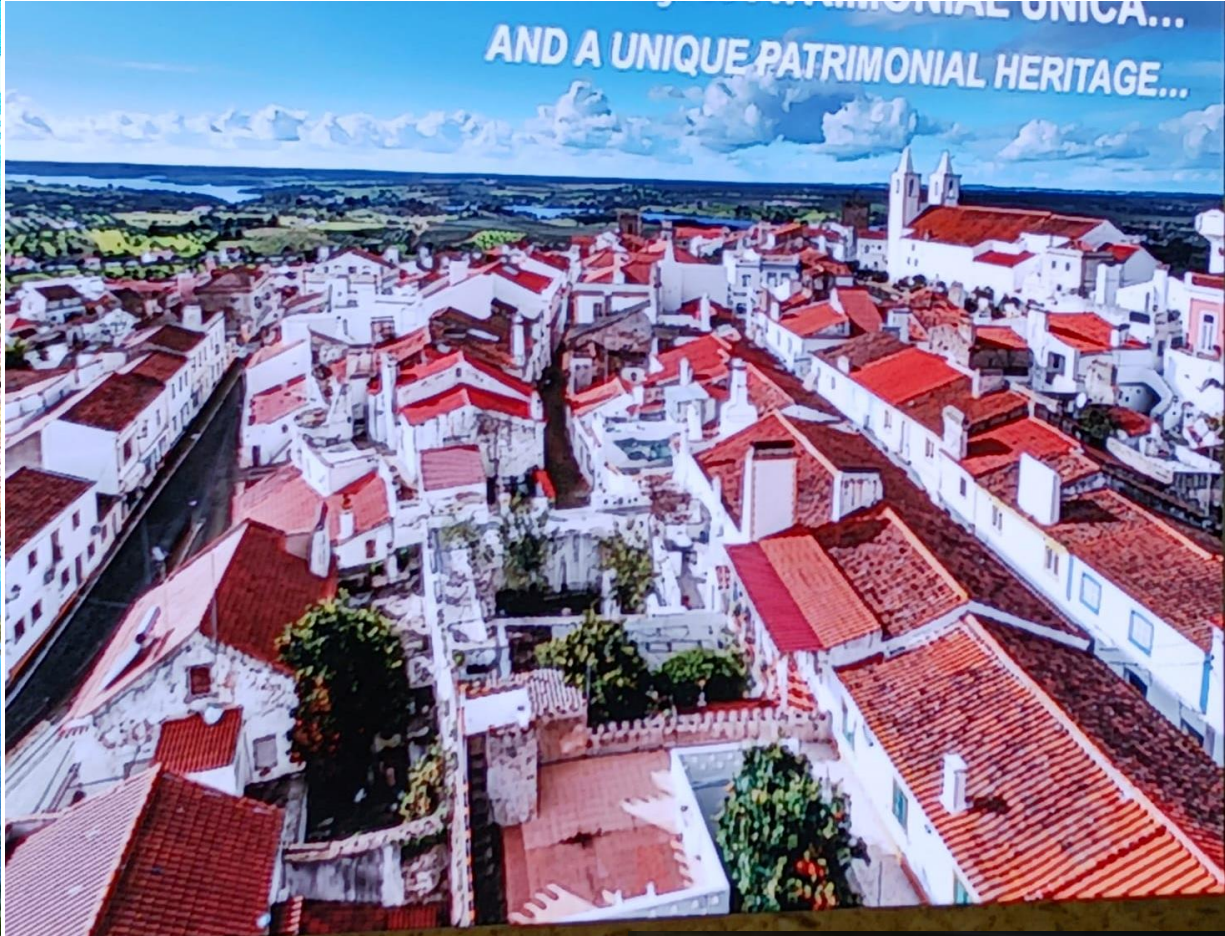
COME AND CHASE THE OLYMPIC CHAMPIONS



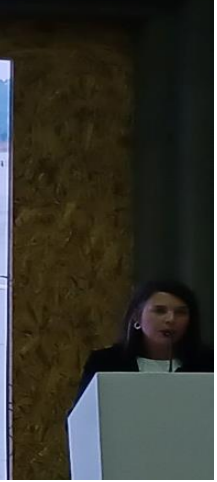
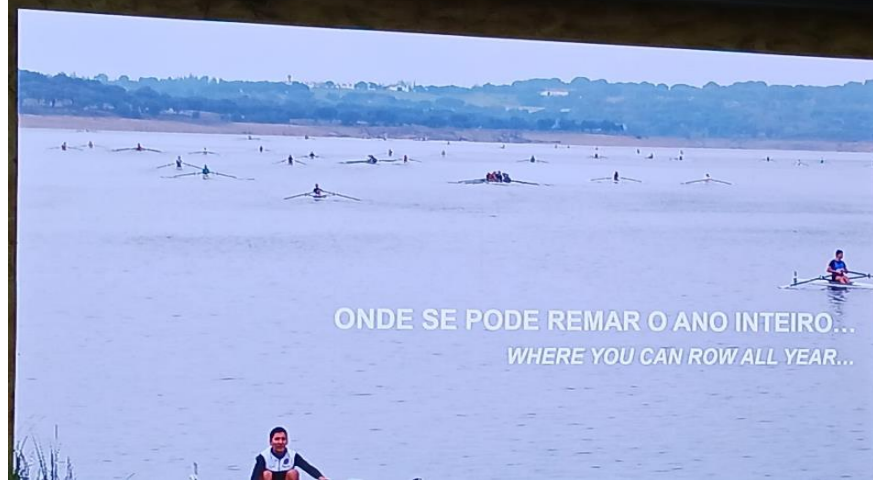
MARCH 25 MARÇO 2017







Municipal councillor presents Avis Nautical Centre



However,

- Superintensive agriculture
- Drought
- Fire
- Resource depletion

(Almeida, 2020; Almeida, Faísca, Freire, 2023)



Now this is the new reality:

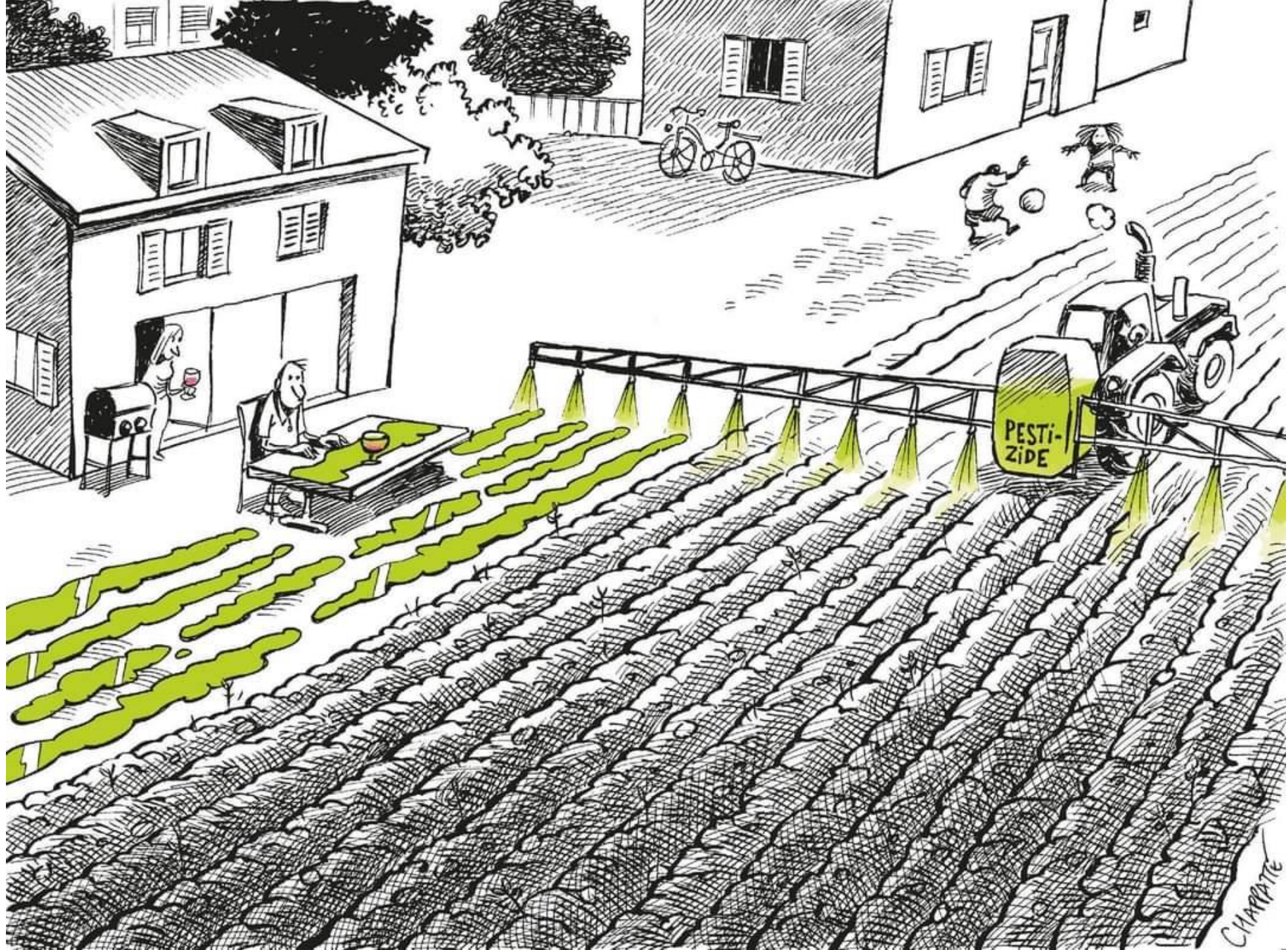


Fernando Máximo



- Superintensive monoculture
- Olive oil for biofuel
- Pulverizing chemicals on olive trees
- Also almonds and other nuts





CHIAPPATE

**Superintensive
olive groves all the
way to the water
line and dams
below normal
levels**



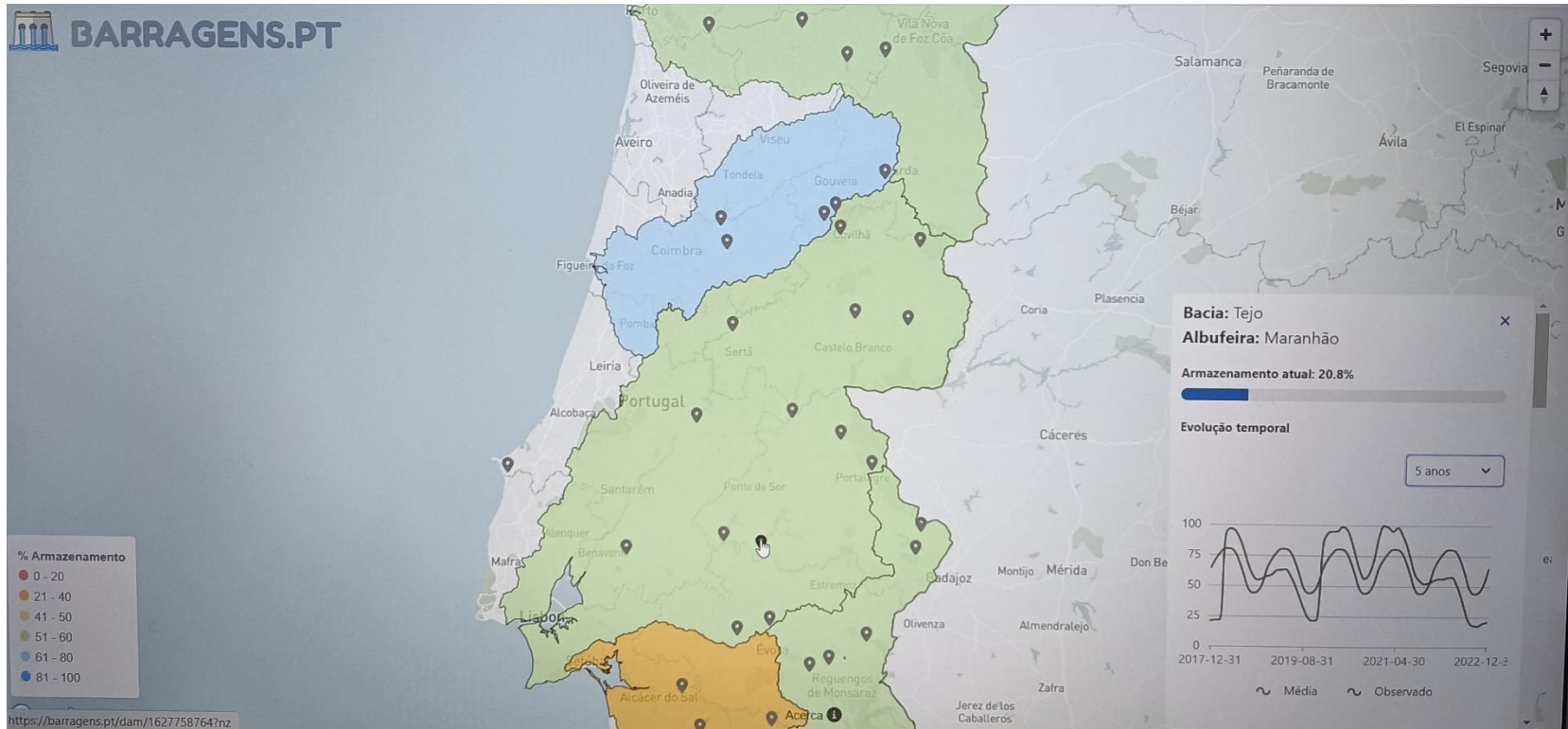
2017-2023 cronic drought. June 2023: 40% of the country in extreme drought



Empty dams in chronic drought



05/12/2022: 19.9%



10/12/2022: 20.8%

Microcystins: toxins produced by cyanobacteria, they produce damage in the liver, both in humans and livestock



SOCIEDADE

Água pode ser letal para o gado: Barragem do Maranhão contaminada pela agricultura intensiva



Odemira and greenhouses for red fruits:

4,000 hectares (9,880 acres) of plastics in the Natural Park of the Southwest of Alentejo and Costa Vicentina





- 6,000 to 8,000 farm workers in the municipality of Odemira, most of the illegal immigrants
- Mostly Nepalese and Pakistanis
- Not enough houses for seasonal workers
- Living in containers in shocking conditions (according to the mayors), near slavery, victims of organizations who bring them from their countries and keep their passports and salaries
- Pollution of water, soil and air with chemicals
- Not enough inspection regarding the environment and working conditions
- Odemira: a new Almeria?

Workers living in containers near Beja, by reporter Nuno Guedes, *TSF*, 30/01/2018 and 08/02/2018

- California model.
- Monoculture.
- Highly mechanized.
- Intensive use of water, chemicals and technology.
- Portugal in a similar situation to raw material dependent economies with high levels of exports to China, such as Brazil and Paraguay.
- Farms are now owned and explored mostly by foreigners in an international trend for land grabbing and resource appropriation.

- Agricultural products have turned into commodities and agricultural sector was incorporated into neoliberal policies and globalization.
- No new permanent jobs. Only temporary jobs, with low wages and illegal immigrant workers living in the worst human conditions
- There are new olive oil factories, but they only function for 3 months a year
- Not interesting for the local economy, nor for social development
- Causes environmental danger, genetic erosion and the end of biodiversity
- Soils will get wasted.

Extractivism

Irreversible damage and ecological destruction within the green revolution paradigm

“multiply stressed regions ‘depressed and contested territories’: areas that not only suffer from pervasive socio-economic and ecological distress but are also currently the object of competing developmental and market models” (Horstink, Schwemmlin, Encarnação, 2023).

Modern-day land grabbing – produces “irreversible social harms”

“tendency of the increasing commodification of natural resources within a neoliberal framework”

“a continued persistence of the neoliberal economic paradigm in world economic affairs has contributed to a widespread belief in the benefits of a development model for poor countries premised on western private-sector-driven investments for the purpose of building exports to western markets” (Pols, Romijn, 2017) – but Portugal is a part of the EU!

“the depletion of raw materials, natural resources, land and soil degradation, climate change, species extinctions, biodiversity loss, and deforestation, are wedded to capital accumulation and the drive for continued exponential growth of the world economy. Increasing global inequalities, across multiple spatial contexts, is another measurable feature of these processes”

“Extractivism involves appropriation of natural and human resource wealth, producing a drain that damages or depletes its source in a potentially irreversible way”

“global agribusiness is compelled by commodity-driven and ecologically destructive extractivist logics of accumulation, especially in the forms of land-grabbing, class struggle, labor exploitation, and the intensification of mechanization and use of chemical inputs” (Chagnon et al, 2022)



All this goes against the *United Nations' Declaration on Peasants' Rights*, which defends:

- food security
- sustainable agri-food systems
- responsible governance of natural resources
- human rights (Alabrese, Bessa, Brunori, Giuggioli, 2022)

GDN – Global Deal for Nature proposes Ecological Restoration to save the diversity of life on Earth: by 2030, 30 percent of the planet (terrestrial and marine) should be fully protected, and 20 percent should be designated a stabilization area (Martins-Loução, 2021).

Extractivism

The United Nations Biodiversity Conference (COP15), in Montreal, Canada on 19 December 2022

Global action through 2030 to halt and reverse nature loss.

Nature is critical to meeting the Sustainable Development Goals and limiting global warming to 1.5 degrees. Adoption of a bold global biodiversity framework that addresses the key drivers of nature loss is needed to secure our own health and well-being alongside that of the planet.

What took place at COP 15:

- Adoption of an equitable and comprehensive framework matched by the resources needed for implementation
- Clear targets to address overexploitation, pollution, fragmentation and unsustainable agricultural practices
- A plan that safeguards the rights of indigenous peoples and recognizes their contributions as stewards of nature
- Finance for biodiversity and alignment of financial flows with nature to drive finances toward sustainable investments and away from environmentally harmful ones

<https://www.unep.org/un-biodiversity-conference-cop-15>



Regarding agriculture,

Expansion and intensification of agriculture are considered the main causes for emission of greenhouse gases, loss of biodiversity, soil and freshwater degradation, and environmental pollution. It's up to the State to produce policies and laws to prevent resource degradation. Mediterranean native biodiversity is not compatible with current irrigation production system (Martins-Loução, 2021).

Chemical-mechanical model:

- Huge input consumption: water, fertilizers, fuel for mechanization, electricity...
- Inefficient use of chemical inputs
- Unacceptable costs of the expansion of cultivated areas at the expense of natural remaining ecosystems
- Public policies for the rural world are insufficient and hard to enforce. They are contradicted by the deregulation of economic practices enforced by large companies.

There is the need for:

- State intervention and public policies to deal with environmental sustainability
- Increasing the efficiency of public policies
- Promotion of the well-being of rural territories and their inhabitants
- Agricultural diversification
- Inspection resource use
- Rules for:
 - Product differentiation regarding ecological footprint in order to guide consumer behaviour
 - Direct economic incentives to production of bio products (Santos, 2013)

Comparisons: Portugal versus Valencia, Spain

“the use of crop areas as an effective path to attenuate depopulation. As such, a series of strategies based on land use management for sustainable agriculture were designed. These strategies, which were applied to the province of Castellón due to its particularly high vulnerability, consisted of simulating the effect of exploiting suitable areas for crop yield in terms of soil and land cover on depopulation risk. The results indicated that using 25% of these areas for agriculture may reduce at least one level of risk in 25% of the municipalities where depopulation was an issue. The characteristics of these agro-economic measures should be in line with current environmental and socioeconomic challenges, which include water scarcity, increased carbon footprint, low quality goods and unemployment. The implementation of extensive and family agricultural practices can help deal with these aspects, thereby contributing to meeting several Sustainable Development Goals (SDGs).

In light of this reasoning, public administrations should promote agricultural development through land use planning by incentivizing the adoption of sustainable practices with financial aids, thus limiting the presence of intensive agriculture entailing higher water requirements, less labour per capita and poorer quality production. This course of action would help mitigate some of the effects posed by climate change, while contributing to achieving local sustainability and healthier diets.” (Jato-Espino, Mayor-Vitoria, 2023)

Debate:

- Depopulation of rural areas is irreversible – another important loss from 2011 to 2021 (census)
- Local government has played an important role in the development of attraction strategies for people, families and private companies. Not necessarily the right ones.
- Public policies by the central government have been put in place. Not successfully.
- Huge contradiction between what is advertised about the rural world, heritage and environment, and the real conditions of frailty, insecurity, environment dangers, fires and unprotected populations.
- Can changing territorial policies contribute to reverse depopulation and protect the remaining rural population?
- There are no inspections to verify how policies are being applied.
- Most urgent:
 - Permanent jobs creation in the rural world
 - More climate appropriate agriculture – considering water shortages.
 - A change in mentalities and culture must occur in order to make people understand that putting money into rural areas is an investment, not a waste.
 - To safeguard the quality of life for the remaining few who still resist urban attraction.

Questions I've been asked

Q. How does the relationship between people and water shape rural areas and the challenges that rural communities currently face?

A. Dams shape rural communities, create new kinds of agriculture, drive people away from agriculture and from the territories. Challenges: alternatives to agriculture, quality of life, water.

Q. How do different narratives of water shape/drive sustainable behaviour and climate action and adaptation in rural areas?

A. Dams changed agriculture, landscape and raised production levels. Destroyed ecosystems, lifestyles, caused soil erosion, pollution and they are reaching their limit.

Q. Are there specific challenges about water that are particularly about rural areas or that are more salient for rural areas?

A. Drought, erosion, desertification, depopulation, pollution, chemical contamination...

Q. What role does water play in the development, transformation, and in the configuration of the identity of rural communities?

A. 100%. Agriculture, industry, living conditions, tourism, sustainability, lifestyle, quality of life, survival. "Since ecosystem services are defined as benefits to society, their value in the regional or local context must be recognized. (...) the residents, or users of the space, must be involved in this whole process, in the pros and cons of valuing the ecosystem" (Martins-Loução, 2021). The Maranhão Dam became a part of the ecosystem and provides cultural, sports and health services. Therefore, citizens and local government should be allowed to participate in decisions regarding its use.



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Thank you!