

# **THE SEA OF PLASTIC**

## **THE INTENSIVE**

### **“PLASTICAGRICULTURE”**

#### **IN ALMERIA**







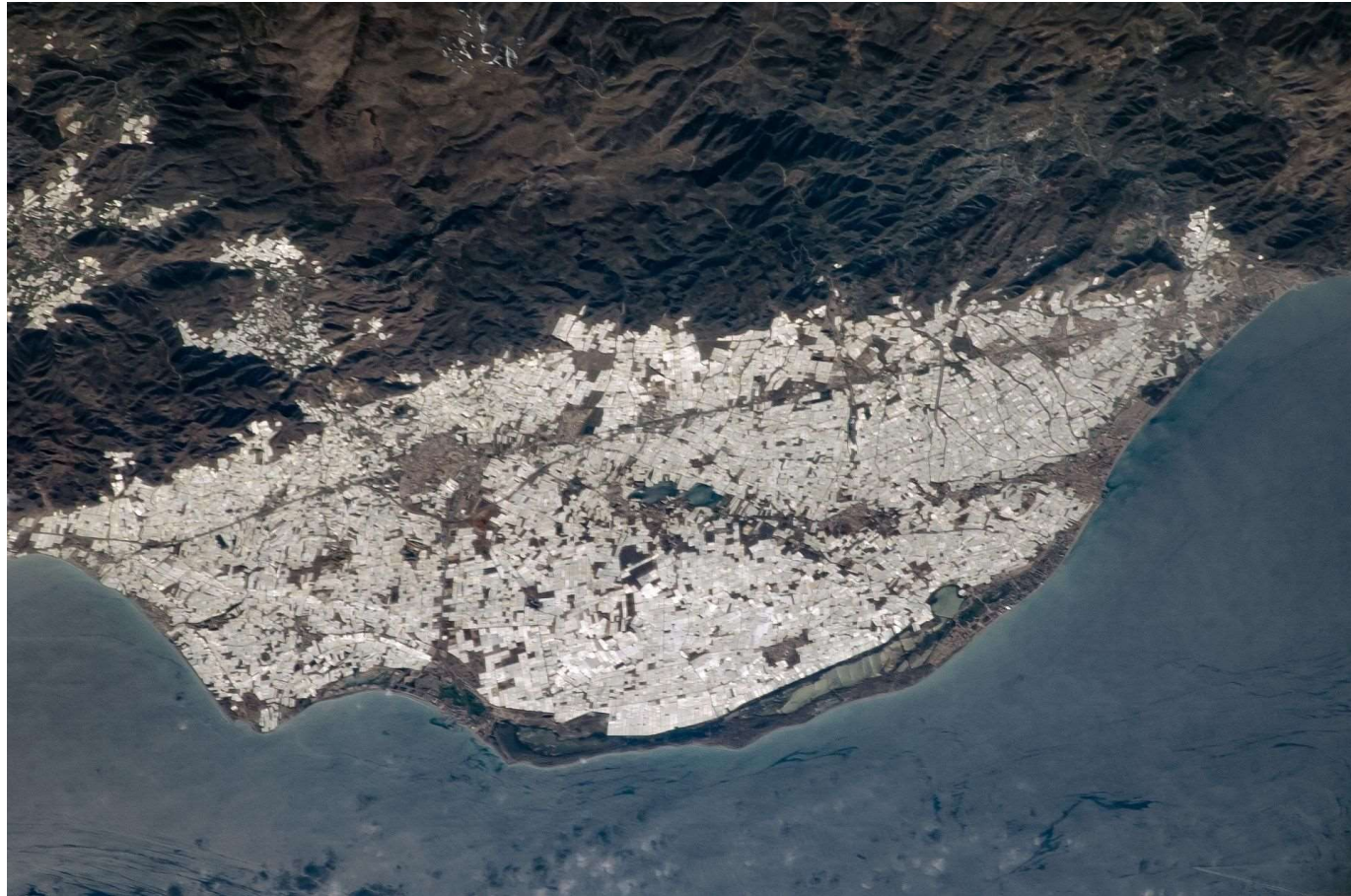






# INTRODUCTION

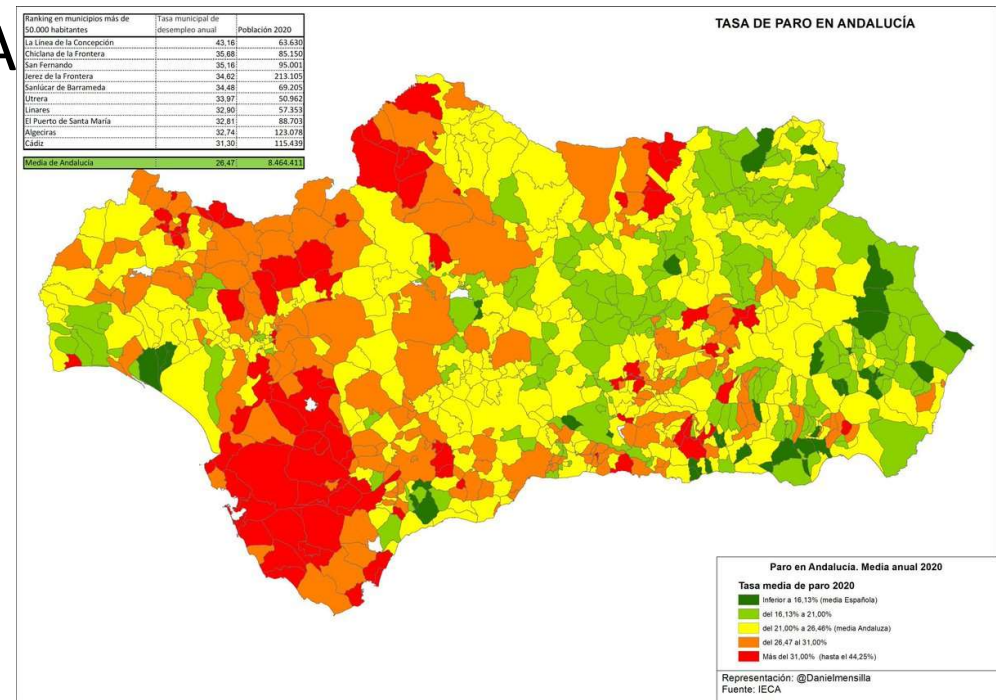
1. Described by environmentalists as a "**sea of plastic**" due to the expansive swaths of land covered by greenhouses.
  - One of the few human constructions **visible from space**.
  - The most important **intensive agriculture under plastic on the planet**.





# INTRODUCTION

1. The **driving force of the regional economy since the 1960s**, because has been capable of
  - A **high level of production** for national consumption and export.
  - Generator of a **business system** of related companies, auxiliary services, marketers.
  - Creator of **employment**.
  - A high gross value added (GVA)





# INTRODUCTION

1. The "Orchard of Europe" → Produce large quantities of **Europe's food supply** (mostly vegetables):
  - Cucumbers, watermelons, eggplants, zucchinis, peaches, peppers and tomatoes, aubergine, courgette, watermelon
2. There is a **geographical indication with denomination of origin**: Tomato de La Cañada-Níjar (a variety is the Raf tomato - resistant to Fusarium-).
3. Also **cut flowers** (roses, chrysanthemums, carnations) and ornamental plants.



# SOME DATA

1. Client countries:
  - Germany, 29.7% of the total, France, 15%, the Netherlands, 13.1%, the United Kingdom, 11.3%, and Italy, 7.2%.
2. The value of **exports of fruit and vegetables** in 2012 amounted to 1,914.1 million euros; these sales accounted for 47.3% of the total exports of Andalusia.
3. Exports of **ornamental plants** accounted for more than 17.8 million euros.
  - The main buyers are France, with 59.6% of the plants, Germany, with a 14.2%, and the Netherlands, with 10.6%.



# WHERE

1. Poniente Almeriense (comarca)
2. **Limits:**
  - The Alboran Sea to the South,
  - The city of Almería to the east,
  - The Sierra de Gádor to the north.
  - The municipality of Albuñol (in Granada province) to the west.
3. Contains ten municipalities → Its center is the so-called "**Campo de Dalías**", which includes the municipalities of Dalías, Berja, El Ejido, up to Adra or in Vícar, La Mojonera and Roquetas de Mar.
4. **Population:** 259,357 inhabitants
5. **Area:** 971 km<sup>2</sup>.

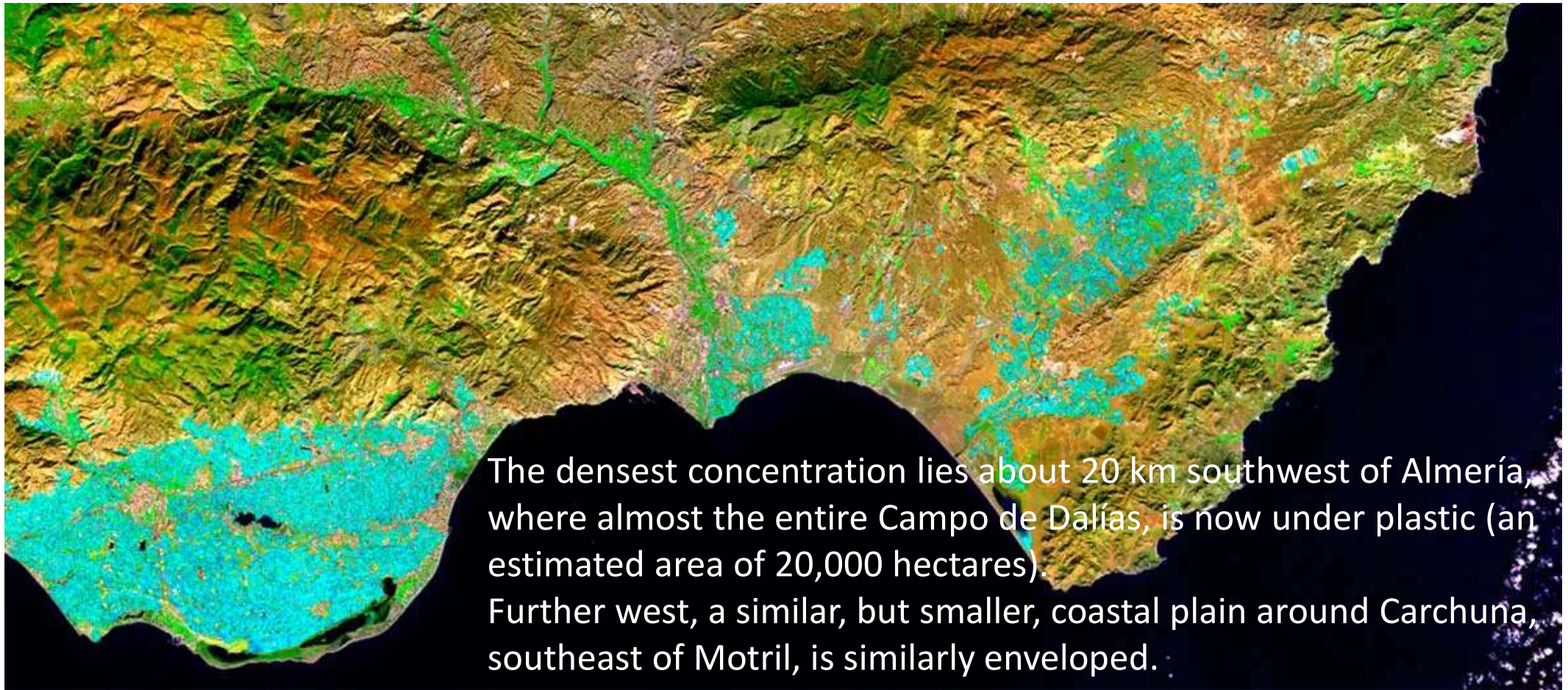




# WHERE

Not restricted to the coastal plains

1. includes wide terraces on the sides of shallow valleys.
2. Elsewhere along the Costa Tropical and the Costa del Sol, particularly between Almería and Málaga.



The densest concentration lies about 20 km southwest of Almería, where almost the entire Campo de Dalías, is now under plastic (an estimated area of 20,000 hectares).

Further west, a similar, but smaller, coastal plain around Carchuna, southeast of Motril, is similarly enveloped.

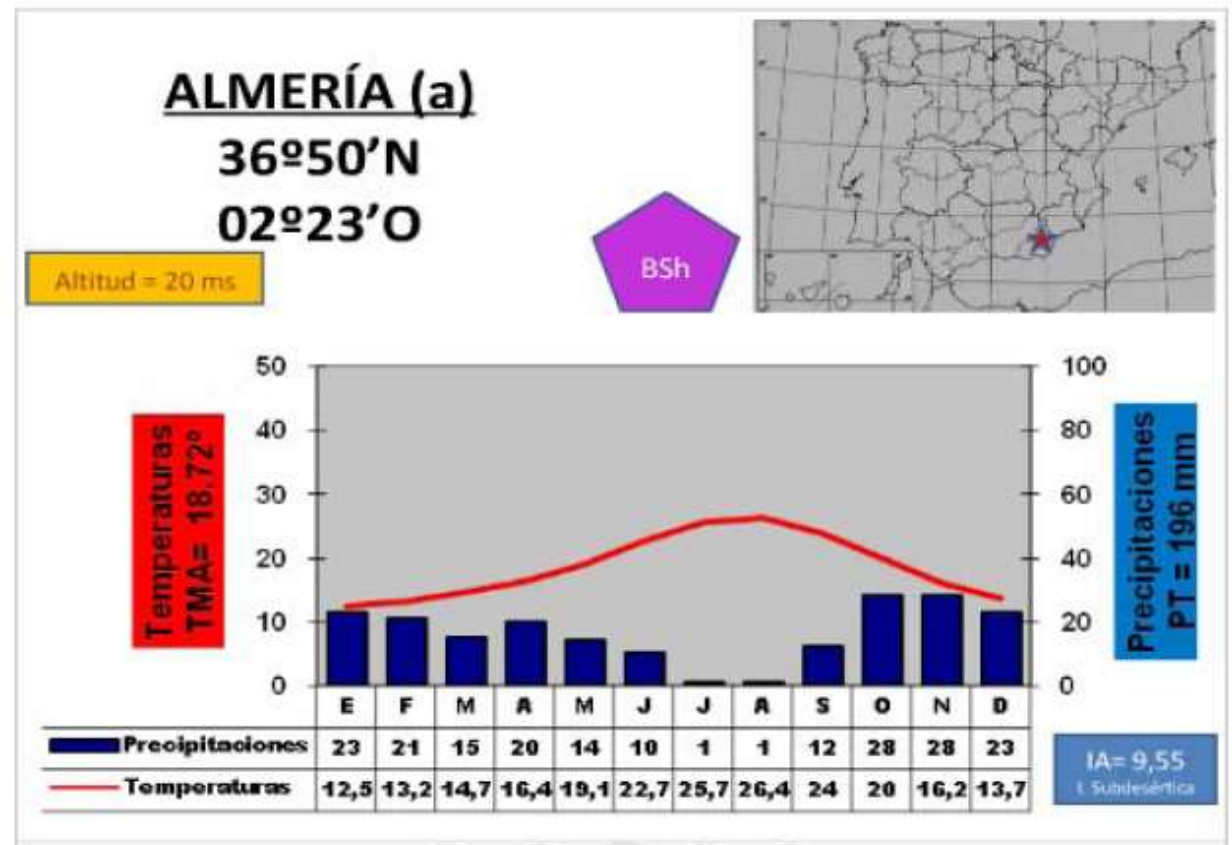






# NATURAL ENVIRONMENT

1. Optimum microclimate for intensive cultivation at any time of the year:
  - Warm in winter (low frost risk)
  - Not extremely hot in summer (easterly winds).
  - Plenty of sunshine (3000 hours per year).

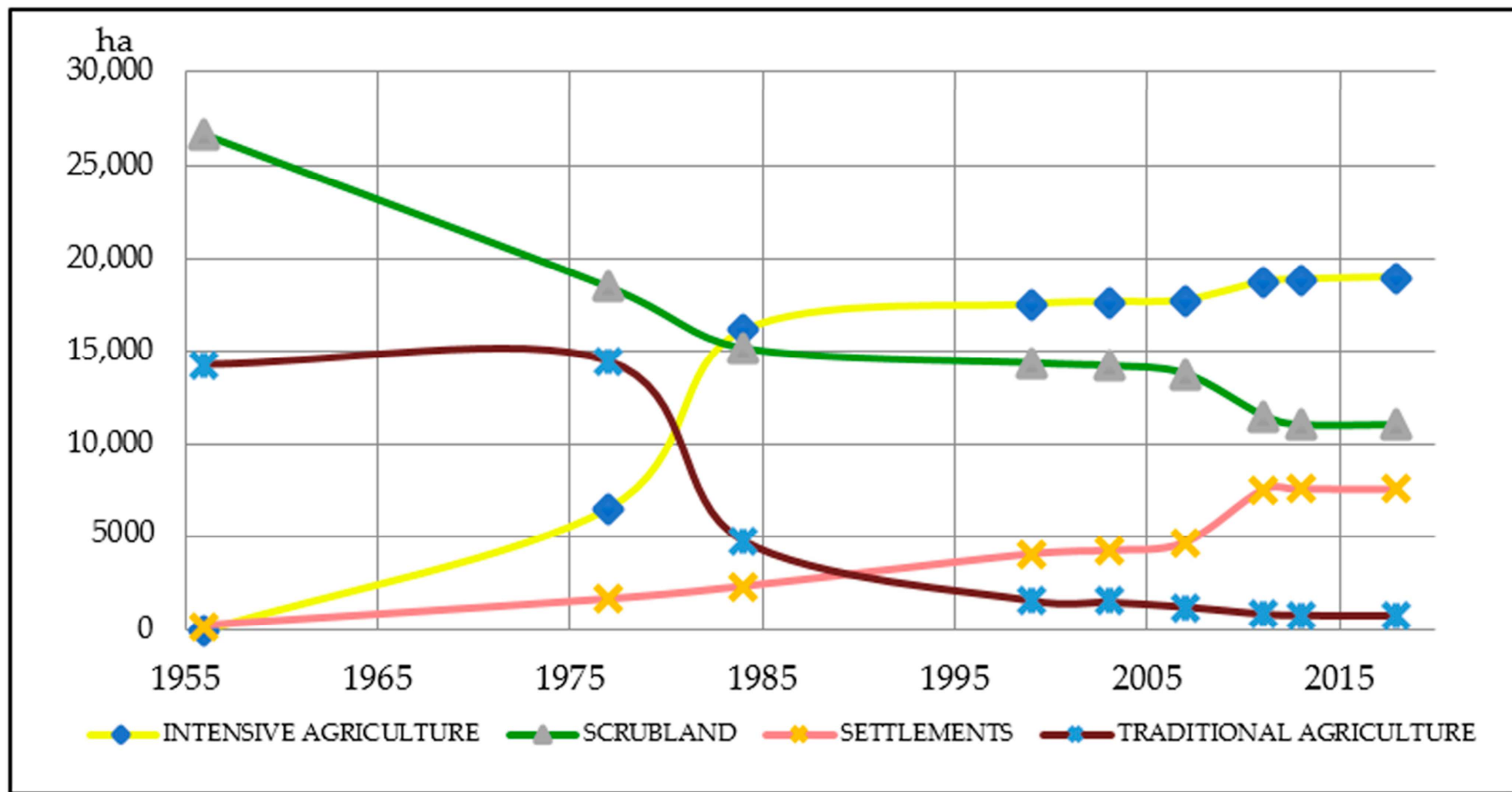




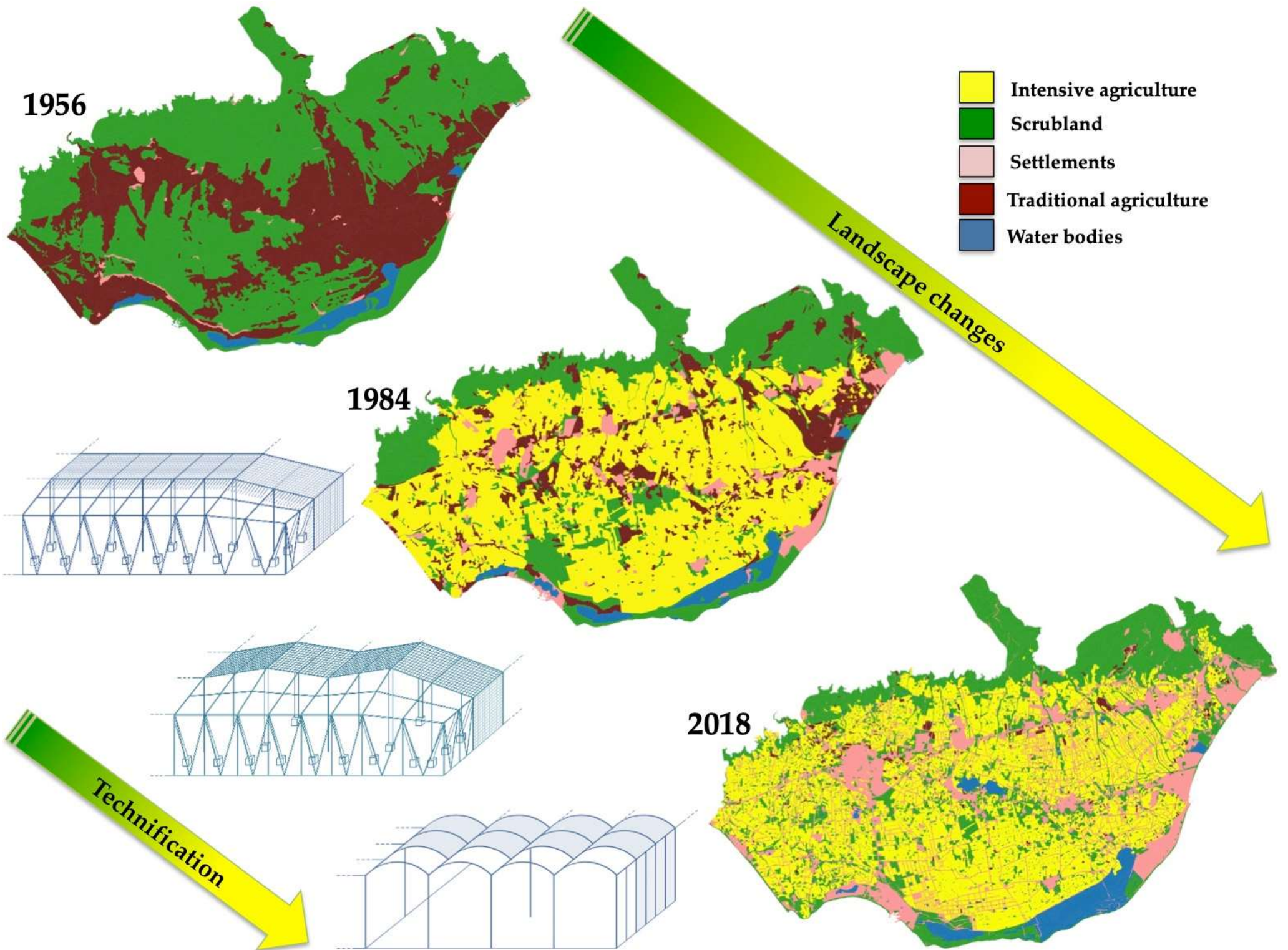
# SOME HISTORY

1. Traditional activity
  - Crops typical of the Mediterranean **dry lands**: cereals, olive trees, grapevines or citrus fruits
  - A subsistence **livestock** (goats, sheeps)
  - The **esparto** grass recollection (shoes).
2. Its great export product from the 19th century to the 1960s was the **table grape** (also known as the Ohanes grape or the boat grape).
3. Official institutions (National Institute of Colonization -INC-; Institute for Agrarian Reform and Development –IRYDA- promoted **colonization plans** which:
  - Settled farmers in old dry-lands transformed into irrigated land
  - Expanded some pre-existing nuclei or created new towns.
4. The first greenhouse was built in 1963

# Land use evolution









**1970**



**2004**





# TECHNICAL CHARACTERISTICS

1. High level of **technical training: Sanding**: spreading a thin layer of sand on the fertilized soil. Neutralizes the effects of the salt in the water, preventing it from reaching the roots of the plants and keeping the soil moist and warm for longer, which accelerates its growth.
2. Integrated **pest control and management** (IPM).
3. Predominance of smallholdings or **family farms** (approximately one hectare):
  - the specialization by a single product is increasingly observed.
  - as well as the concentration in a few large firms.
4. Use of **greenhouses**.

# TECHNICAL CHARACTERISTICS

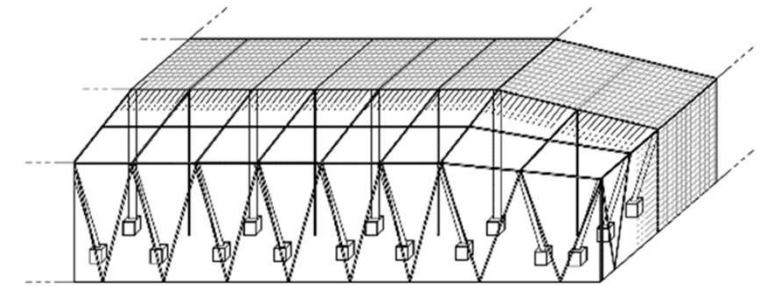
1. **Rational use of water:**  
underground water
2. The **drip irrigation** system preserves and saves the area's water resources, which are obtained mainly from **aquifers** of the Campo de Dalías which in turn originate in the nearby Sierra de Gádor.



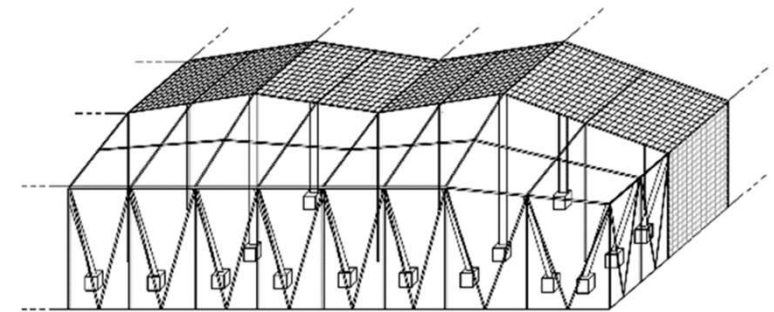


# THE GREENHOUSES

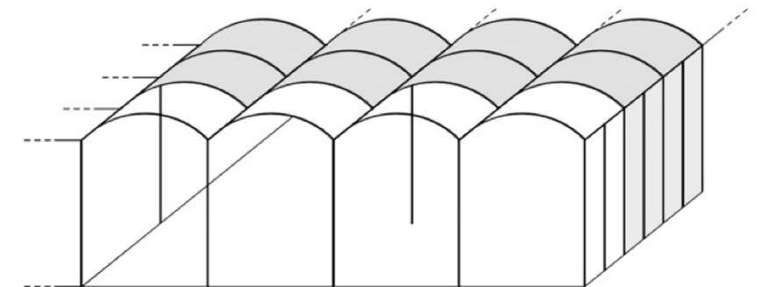
1. The use of **polyethylene** as a substitute for glass was tested in the Canary Islands and Catalonia before.
2. The plastic was spread over **wooden posts or metal structures** and secured by wire.
3. **Intensifies the heat and maintains the humidity.**
4. Allows harvests to be harvested **one month earlier** than in the open field and more ahead than in other regions:
  - Starting harvesting in December and allowing the plant growth of the autumn-winter plantings until March, doubling and sometimes tripling the number of harvests.



(a)



(b)



(c)

# PROBLEMS: SOCIAL

1. **Migrant agricultural workers:** in 2015 out of 120,000, 80,000 were undocumented and not protected by Spanish labour legislation.
2. Labeled "Europe's dirty little secret" due to the documented abuses of workers → facing **severe social marginalization and racism**
3. Simultaneously being **exposed** to
  - Extremely difficult working conditions:
    - ✓ Temperatures as high as 50°C with lack of ventilation
    - ✓ Toxic pesticides
  - “Slave-like” conditions (being denied basic rest facilities and earning extremely low wages.





# PROBLEMS: SOCIAL

1. After the 2010s, a submerged agriculture related to the **cultivation of cannabis** has been slowly but progressively developing, carried out both in greenhouses and inside warehouses and homes.
2. Production is appreciated at a European level for its quality, being in fact mostly exported to the entire Old Continent.
3. Attempts have been made to tackle the problem by **granting licenses** for the cultivation of therapeutic cannabis (Retamar).



# PROBLEMS: ENVIRONMENTAL

## 1. Water scarcity

- The use of a resource as scarce as water has been a **secular problem**.
- **Structures** for the collection and storage of rainwater are preserved.
- In the 19th century, attempts were made to alleviate this problem with the construction of **reservoirs** (Isabel II, Benínar, Cuevas del Almanzora reservoir).

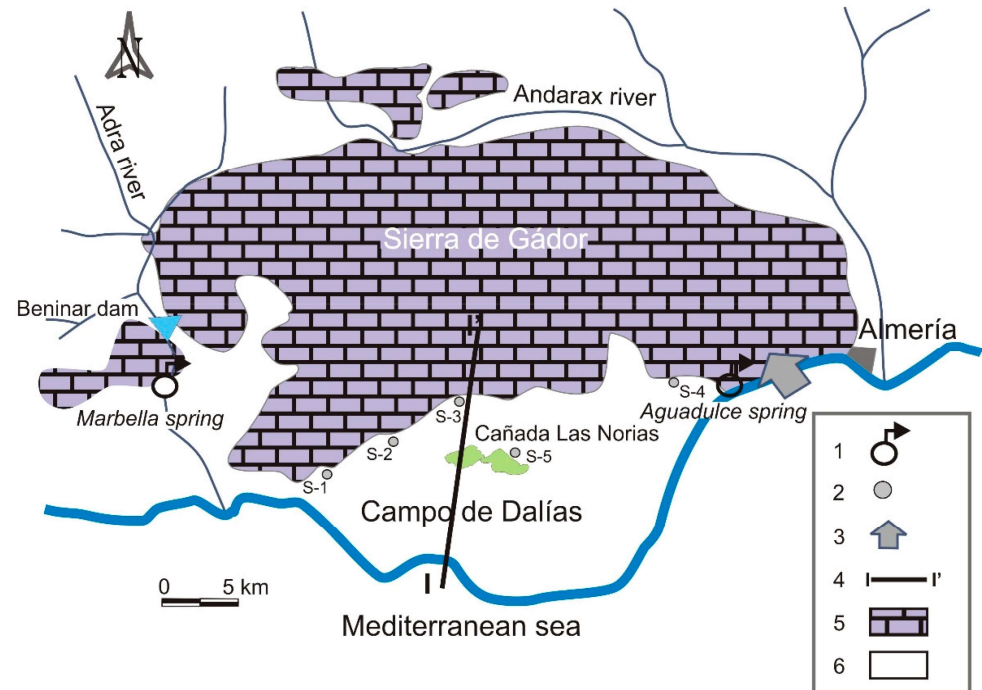




# PROBLEMS: ENVIRONMENTAL

## 1. Water scarcity

- The existence of **underground aquifers** was known long ago (Campo de Dalías aquifer has been known since the beginning of the 20th century), but it was not possible to extract the water from depths of 40 to 100 metres.
- In 1957, modern high-capacity pumps began to be used.



# PROBLEMS: ENVIRONMENTAL

## 1. Water scarcity

- To alleviate the water deficit in the region, in 2015 the Acuamed Campo de Dalías **desalination plant** came into service.
- The local government has also **banned drilling** new water wells, but this is often ignored and new wells are drilled up to a depth of 2000 meters.





# PROBLEMS: ENVIRONMENTAL

## 1. Plastic waste

- One significant component of plasticulture is the disposal of used plastics.
- Some 30 000 tons of plastic waste is created each year.
- In places where the soil has become infertile, the greenhouses are abandoned after shredding them.
- The plastic waste from the greenhouses is reported to run off into the Mediterranean Sea.
- Technologies exist which allow for many plastics to be recycled into viable plastic resins for reuse in the plastics manufacturing industry.



# PROBLEMS: ENVIRONMENTAL

## 1. Plastic waste

- Recycling of **plastic mulch** is difficult because the mulch is often wet or dirty →
- Thin mulch breaks down quickly and is **difficult to pick up** for recycling once degraded.
- Moreover, plastic degradation into **microplastics** is **damaging to soil health**, microorganisms and beneficial organism like earth worms.





- <https://www.youtube.com/watch?v=Zh-sBrAFE8g>



[https://verne.elpais.com/verne/2015/09/23/articulo/1443003299\\_631218.html](https://verne.elpais.com/verne/2015/09/23/articulo/1443003299_631218.html)