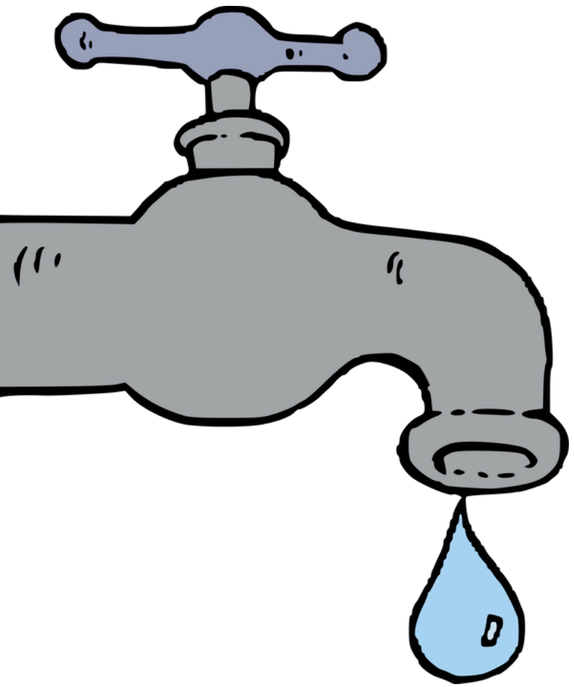
Cofinanciado por la Unión Europea

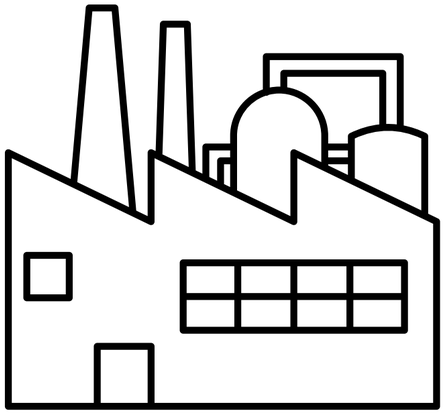
WATER RESOURCES IN SPAIN and THE CANARY ISLANDS

Gran Canaria, 13th- 18th May, 2024

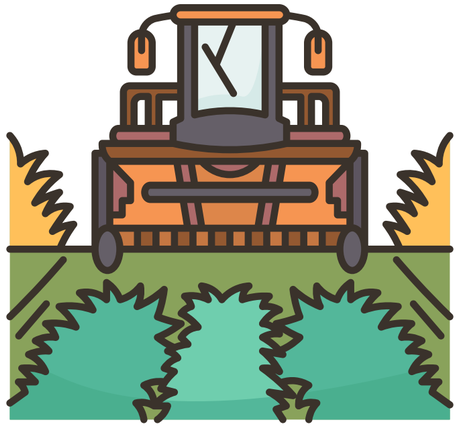
SPAIN: the challenge of a dry land



- Spain is one of the most water stressed industrialised countries in the world.
- The country is facing the challenge of ensuring long term water security.
- The Government is investing a lot of money on this issue, to find possible solutions to the problem.

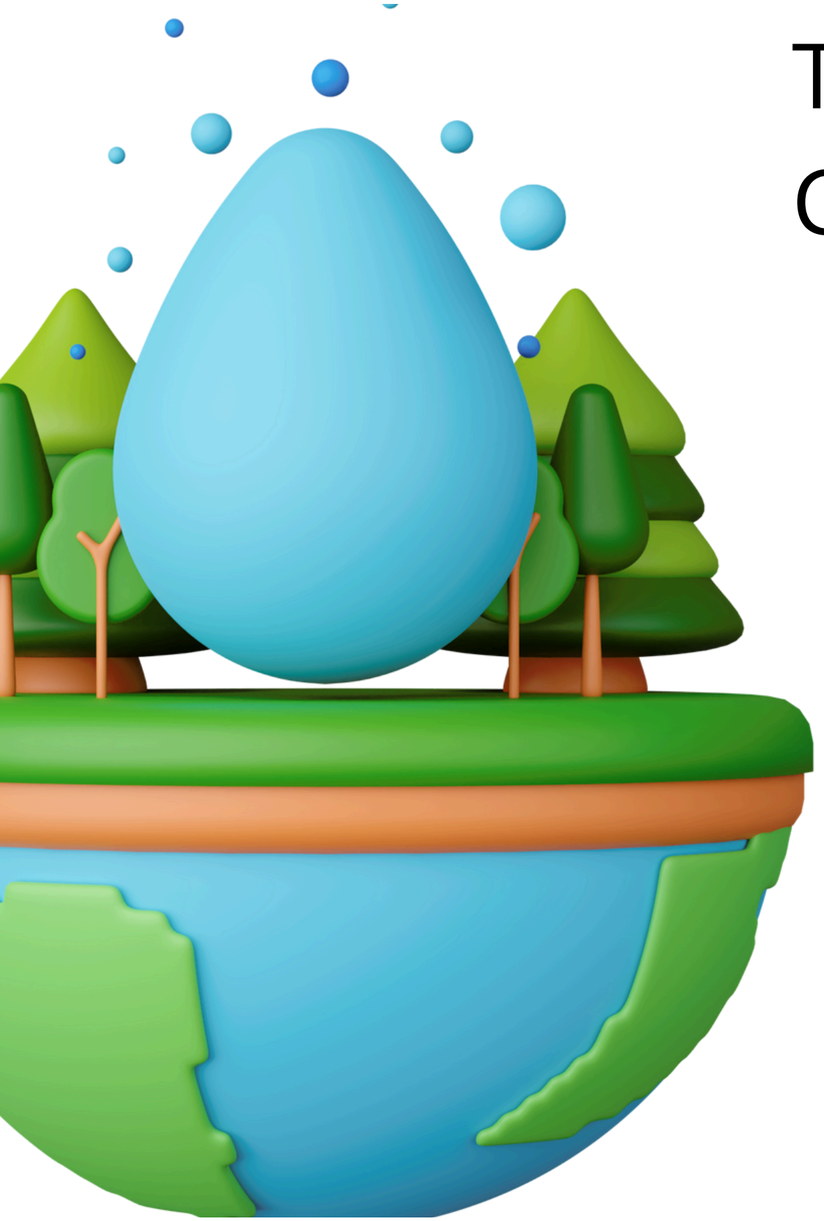


SPAIN: the challenge of a dry land



- **SIGNIFICANT STRESSORS.**
  - **Agriculture** (it accounts between 70%-80% of water use)
  - **Tourism** (127 liters per day / 450-800 liters per day)
    - “Let’s Make a Deal Project” (2019) - savings of 2 million litters of water compared to previous years.
  - **Unconscious waste of water**

WATER RESOURCES IN THE CANARY ISLANDS



The water resources available in the Canary Islands are of three types:

- **surface water**
- **groundwater**
- **water from industrial production.**

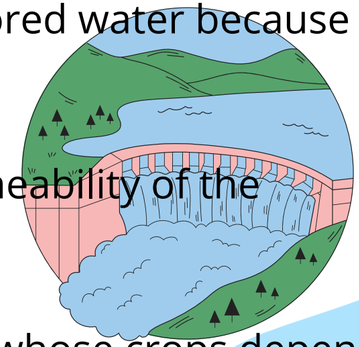
WATER RESOURCES IN THE CANARY ISLANDS

SURFACE WATER

Surface water comes from precipitation. When it rains, water flows through ravines towards the sea. Some of it is collected in dams, ponds, and other reservoirs.

In the Canary Islands, there are **no rivers.** There are very few streams that carry water throughout the year.

The islands of Gran Canaria and La Gomera have the largest capacity of stored water because their soils are more impermeable.



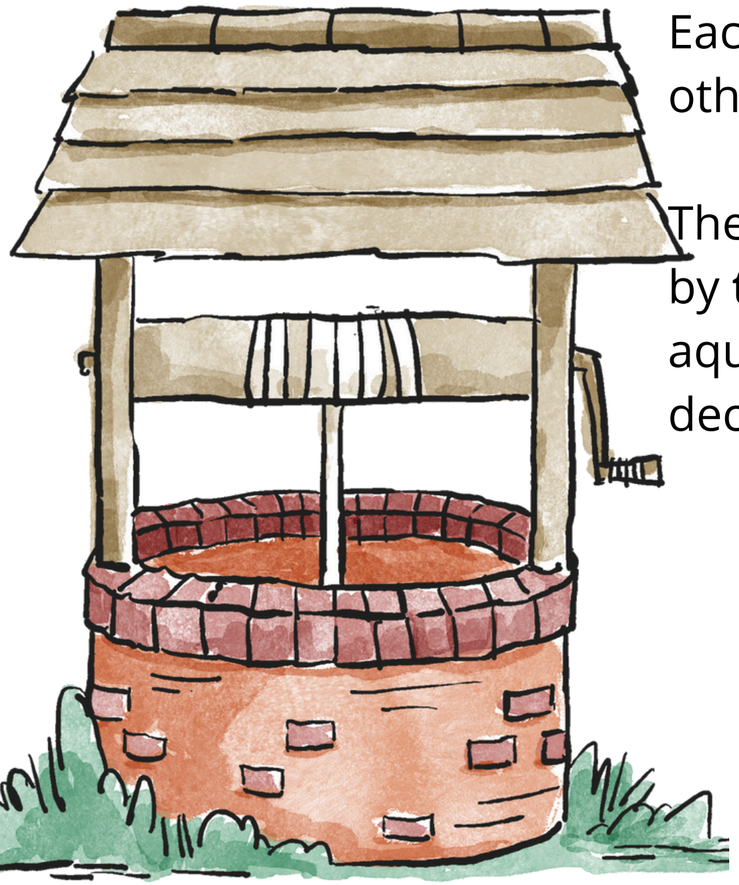
Other islands, like Tenerife and El Hierro, due to steep slopes and the permeability of the terrain, face many difficulties in building dams.

Stored water is of great economic importance for some agricultural areas, whose crops depend on rainfall flowing through ravines and filling dams.

WATER RESOURCES IN THE CANARY ISLANDS

GROUNDWATER

Groundwater originates from **aquifers** and can naturally emerge through **springs** or artificially through **galleries and wells.**



Each island can be considered a **unique and independent aquifer** from those of the other islands.

The water in aquifers constitutes a reserve that is not inexhaustible. They are recharged by **the infiltration of rainwater**, but if more water is extracted than infiltrates, the aquifer is overexploited, causing the reserve to decrease and the extracted water to decrease in quantity and quality.

WATER FROM INDUSTRIAL PRODUCTION

UsIng water from industrial production to recharge aquifers would greatly benefit the environment, as aquifers have been overexploited in recent decades through wells and galleries.

In the Canary Islands, **aquifers have been overexploited**, resulting in a decrease in the water table. As a result, numerous springs have dried up, wells and galleries have had to be dug deeper, and the risk of **desertification has increased.**

Currently, industrial water production opens up new possibilities for conserving subsurface reserves because the needs arising from population growth and economic development can be met without increasing extractions.

It may even be possible to use **water from desalination plants** and wastewater treatment plants to recharge aquifers, which would be a huge benefit to our environment.

Desalination plant in GC

WATER RESOURCES IN THE CANARY ISLANDS

INDUSTRIAL WATER PRODUCTION

Desalination plants and wastewater treatment plants are the two types of industrial water production facilities.

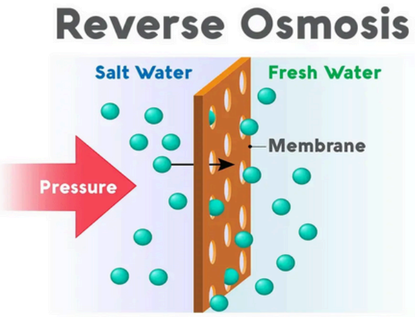
Desalination plants separate the excess salts from seawater, converting it into drinkable water.Before the desalination plants came into operation in the Canary Islands, there were times when it was necessary to subject the population to severe water supply restrictions.

Wastewater treatment plants clean wastewater of the contaminants it contains and make it suitable for reuse in some uses, such as irrigation.

Canarias was one of the first regions in the world to apply technology to water production, as it has been severely affected by scarcity, especially in the eastern islands. Currently, the consumption of desalinated and treated waters is constantly increasing in our islands.

It was was very expensive at first, nowadays, with modern reverse osmosis desalination plants, the price per cubic meter has decreased significantly. Industrial water production will be very beneficial for the environment as it will help prevent overexploitation of aquifers. However, it is important to note that producing water consumes energy and makes us more dependent on petroleum.

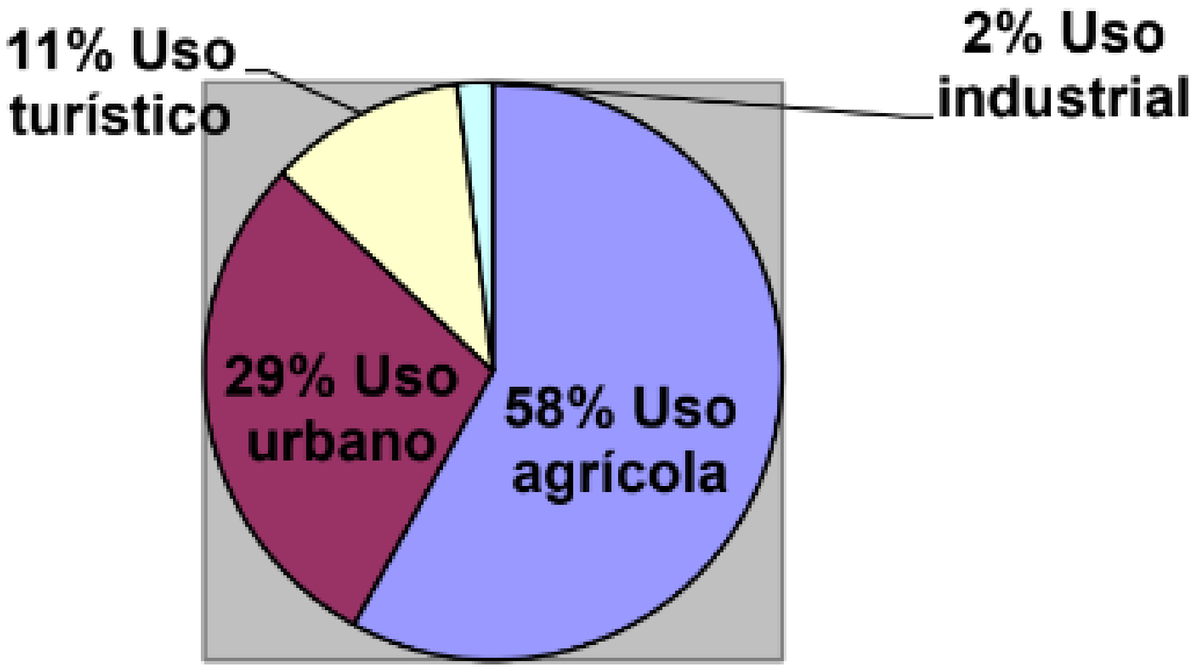
Islands surrounded by water have water problems?



WATER RESOURCES IN THE CANARY ISLANDS

How have the Canary Islands managed to meet the growing demand for water?

Consumption by sectors
The percentages of water allocated to different uses in Canarias are as follows:



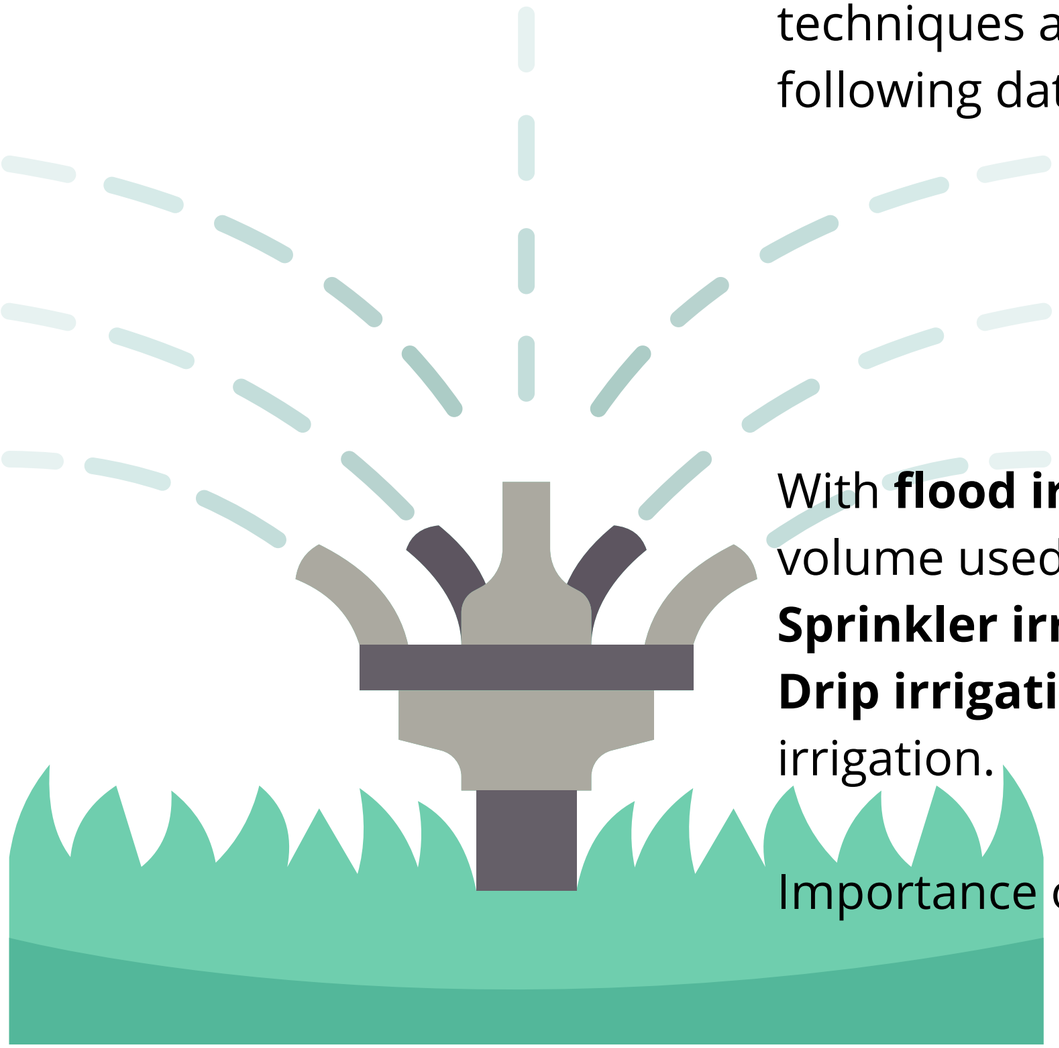
We observe that the highest percentage of consumed water is allocated to agricultural use, while the lowest is for industrial use, but it differs from island to island

The agricultural sector has the **most potential for water savings by modernizing irrigation systems** through the expansion of sprinkler and drip irrigation. Additionally, the reuse of treated water for irrigation opens up significant opportunities for savings.

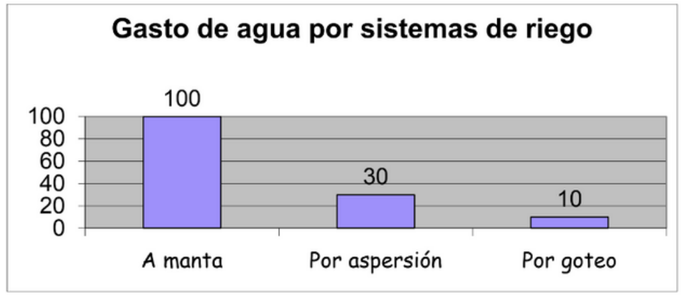
In the urban and tourist sectors, there are also opportunities for water conservation, including the treatment of consumed water and the use of treated water for irrigation in landscaped areas.

WATER RESOURCES IN THE CANARY ISLANDS

IRRIGATION METHODS



Irrigation methods are of great importance because the use of modern techniques allows for significant water savings. To verify this, let's look at the following data:



With **flood irrigation,** which is the traditional method, only **30%** of the water volume used is utilized.
Sprinkler irrigation allows for a 70% saving compared to flood irrigation.
Drip irrigation results in even greater savings: 90% compared to flood irrigation.

Importance of investments to save water and helping the environment.

WATER RESOURCES IN THE CANARY ISLANDS

The decline in the importance of agriculture has been accompanied by an increase in consumption in the tourism sector. The average consumption reaches 600 liters per bed per day. (From canarias.org)

CONSUMOS	Lanzarote	Fuerteventura	Gran Canaria	Tenerife	La Gomera	El Hierro	La Palma
Urbano	26%	29%	32%	27%	9%	23%	8%
Turístico	40%	48%	11%	10%	9%	3%	2%
Industrial	3%	4%	4%	5%	0%	1%	0%
Riego	23%	11%	43%	49%	69%	63%	77%
Pérdidas	7%	9%	9%	9%	13%	9%	13%
TOTAL	100%	100%	100%	100%	100%	100%	100%

WATER RESOURCES IN THE CANARY ISLANDS

The Water Law

The water resources of the islands are legally regulated by the Water Law of the Canary Islands, dated July 26, **1990**.

The preamble of this law states that its purpose is "the subordination of all waters to the general interest, on the basis that it is a resource that must be available in the necessary quantity and quality, within the framework of respect for the environment of the islands."

The law also aims to "respect the economic content of rights arising under previous legislation" and aspires "to close a controversial and difficult period in hydrological matters in the Canary Islands, opening a new stage in which **water should not be an obstacle to the coexistence of all Canarians**, whose differences should be set aside in the face of the common task of orderly and rationally exploiting a vital resource for all."

WATER RESOURCES IN THE CANARY ISLANDS

Hydrological Plans

The Water Law of the Canary Islands, dating back to 1990, dictates that the Administration is responsible for evaluating the resources and needs to plan necessary hydrological actions.

In compliance with this law, each island has an Insular Water Council, whose president is the corresponding Insular Council president. Each Insular Water Council is tasked with drafting the Insular Hydrological Plan for its island.

The Government of the Canary Islands is responsible, according to the law, for approving the Insular Hydrological Plans, as well as for drafting and approving the Regional Hydrological Plan.

WATER RESOURCES IN THE CANARY ISLANDS

Hydrological Plans

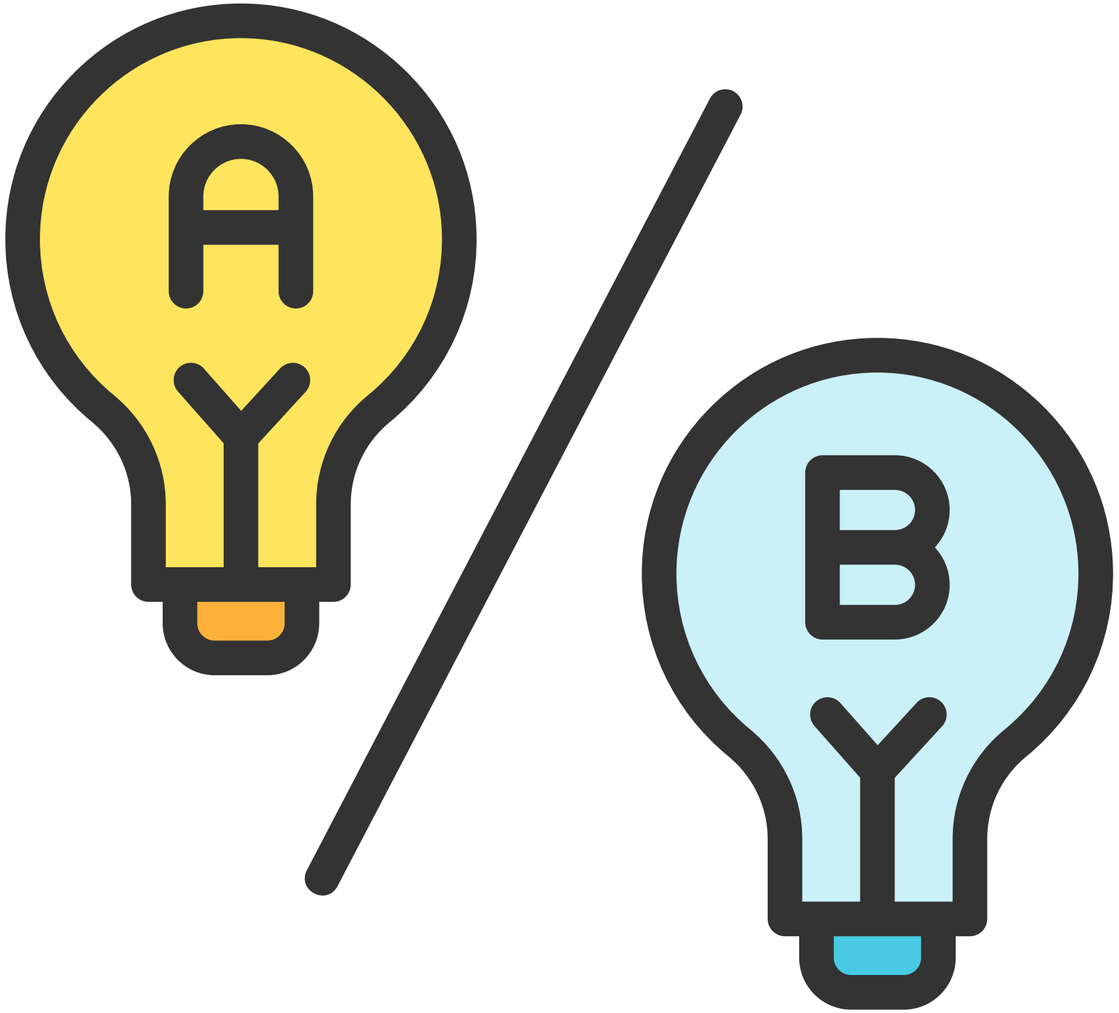
The demand for water in the Canary Islands has constantly increased due to the expansion of crop areas, as well as tourism, urban, and industrial growth.

To meet the growing demand, excessive groundwater extraction has occurred. Consequently, many springs have dried up, and the water from galleries and wells has decreased in quantity and quality. The territory of the islands is exposed to a serious risk of desertification.

Therefore, initiatives for economic development must be carefully evaluated to ensure that the increase in water needs does not compromise environmental conservation: ex. creation of new golf courses (positive for tourism // Negative for environment)

The development of the islands must be sustainable, meaning it should be compatible with environmental conservation.

Comparing data



	Mainland Spain	Canary Islands
Climate	Mediterranean Atlantic Maritim	Subtropical
Rainfall	650 ml per year	100-500 ml per year
Fresh water resources	Precipitation Rivers Groundwater Reservoirs	Precipitation Groundwater Desalination
Subterrranean water resources	Aquifers Groundwater management	Volcanic aquifers Water supplies Desalination water

INNOVATIVE EXPERIENCES IN GRAN CANARIA

Life Nieblas

Thank you for your attention

Bibliography

Water in Spain: the challenge of a dry land

Spain is one of the most water-stressed industrialized countries in the world. The country faces the challenge of ensuring long-term water security.

We Are Water /

RACHEL CHAUNDLER FOR THE NEW YORK TIMES

A Glimpse Into Spain's Future, Where Water Comes by Truck, Not Tap

By Rachel Chaundler October 22, 2023

Residents of Pozoblanco and 22 other villages in the country's south have had to get their drinking water from tankers since April, when the

The Water Crisis in Spain

The recently declared state of emergency in Catalonia and Barcelona reflects the deepening water crisis that Spain and the world faces.

eco-nnect / Feb 4

Water scarcity: Spain's new drought measures threaten mass job losses

Spain's rivers are drying up, but government plans to preserve water supplies could leave 25,000 agricultural jobs at risk.

CGTNOfficial

https://www.gobiernodecanarias.org/medioambiente/materias/calidad-del-agua/el-agua-en-canarias/recursos-hidricos/el-agua-en-canarias/

https://uvadoc.uva.es/bitstream/handle/10324/33471/TFG_F_2018_231.pdf?sequence=1

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