



Sustainable Tourism Observatory of Malaga

Water management



Ciudad
de Málaga



INSTO

International Network
of Sustainable Tourism
Observatories



UNIVERSIDAD
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Plan de
Recuperación,
Transformación
y Resiliencia





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Context

Water is a limited and essential resource for the economic development of a region, which must be protected and preserved in order to guarantee its supply for the population.

In 2000, the European Union established a framework for community action in the field of water policy through the Water Framework Directive, with the aim of requiring Member States to ensure the environmental protection of aquatic ecosystems and the sustainable use of resources, and also to prevent or reduce water pollution and the negative impacts of droughts and floods.

The Andalusian Water Act (2010) is aimed at meeting the objectives set out in the Water Framework Directive, thus establishing an autonomous regulatory framework for the use and management of its water resources. This law also ensures basin unity and integrated water management through the Hydrological Plans of the Intra-Community River Basin Districts of Andalusia, including the Andalusian Mediterranean River Basin District (DHC-MA), to which the municipality of Malaga belongs. Its objectives include making efficient use of this resource to ensure that high-quality water resources are available in the long term, considering the establishment of measures to prevent any impacts from extreme weather events and the effects of climate change. Dependence on water resources for various socio-economic sectors was underlined in the Andalusian Climate Change Strategy and later in the Andalusian Climate Change Adaptation Plan. Furthermore, the Hydrological Plan 2021-2027 considers the impact of human activity on the state of water resources, and examines the effects of climate change on water resources in greater depth.

02.

Targets

- To reduce drinking water consumption in the private tourism sector.
- To achieve more responsible consumption in the short term: total consumption below 135 litres per capita/day and below 110 litres per capita/day in the case of household consumption.
- In the long term (2050) to achieve total consumption of 125 litres per capita/day and household consumption below 100 litres per capita/day.
- To reduce water losses from the drinking water distribution system and increase its digitalisation, with the aim of saving 3,256,400 m³/year and 2.64 GWh of electricity per year.
- To build stormwater treatment facilities to reduce the pollutant load discharged into the sea. An action plan has been proposed for all the city's districts with the aim of draining 400 hectares of land using sustainable systems, extending the separate sewage network to 60% of the city's surface area and constructing 25 stormwater treatment points.
- To create a system to drain rainfall with a return period of up to 25 years.
- To review and optimise 100% of the smart irrigation system, redesigning its layout and redistributing water usage between different zones and species to make it more efficient.

Results

Water usage

Water consumption has been an issue for some time now, given the problems caused by droughts and the increase in the amount of drinking water used for extensive agricultural irrigation, sports activities, swimming pools and golf courses.

“Per capita household consumption was 124 litres per day and total consumption stood at 159 litres in 2020.”

In 2020, per capita household consumption was 124 litres per day and total consumption stood at 159 litres per capita per day (Figure 1).

Analysing the different sources of water usage is useful because it allows us to identify

the sectors that have the biggest impact on the consumption of this natural resource and, consequently, where the possibilities of establishing water-saving policies are greatest. As a general rule, household consumption accounts for the highest percentage of the sectors covered in the report, standing at 79% in 2020. Others, such as the industrial and commercial sectors, account for only 17%. This means that household consumption offers the greatest potential for savings or management improvements. Figure 2 shows the total volume of water consumed for domestic use, revealing a consistent trend, with values exceeding 70,000 m³.

Water consumption is shown below, based on cubic metres billed, for two of the city’s most important monuments: the Alcazaba and the Gibralfaro Castle. It should be noted that EMASA’s billing periods are every two months (bimonthly). Therefore, each year has 6 periods that are not calendar months. These periods are established on a bi-monthly basis from the date on which the meters installed in the monuments are read.



Water saving

In 2020, the short-term goal was set to achieve total consumption of less than 135 litres per capita per day, which would be a 15.09% reduction on 2020. In the case of household water consumption, the aim is to achieve less than 110 litres per capita per day in the short term, which would mean a reduction of 11.29%.

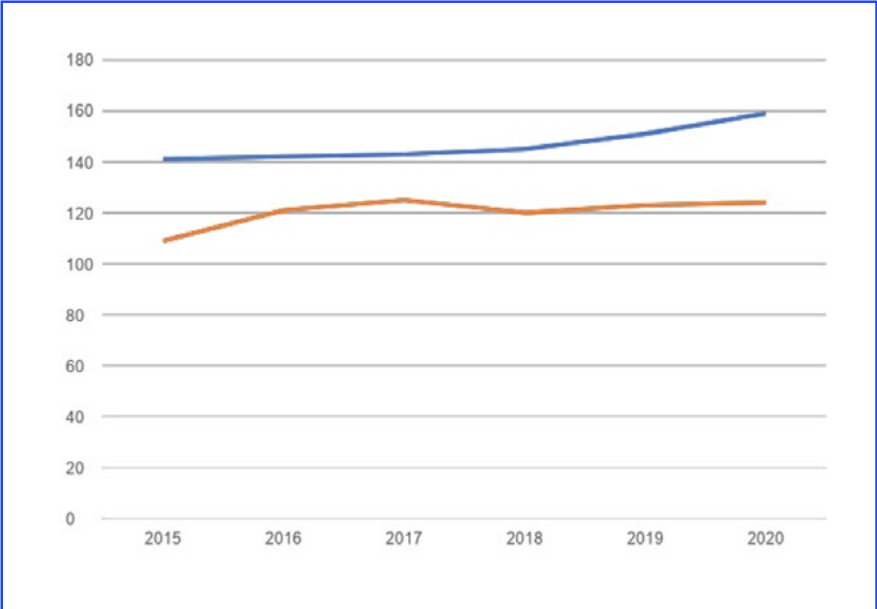
As a long-term target (2050), a 21.38% reduction in total consumption (125 litres) and a 19.35% reduction in litres consumed per capita per day (100 litres) is expected. The environmental advisory centre has established a good practice handbook to help and guide the business community to improve environmental quality, including a section on conserving water.

Along the same lines, Malaga City Council is also working on implementing new software: the “Suspicion Calculation Engine” (MCS), which will detect meter malfunctions, provide alerts on leaks and deliver information on high, unusual or zero consumption. The aim is to avoid water wastage due to internal faults and to optimise consumption.

Furthermore, in terms of water usage to save energy, the aim is to reduce water losses in the drinking water distribution system and increase its digitalisation with the objective of saving 3,256,400 m3/year and 2.64 GWh of electricity per year. Another goal is to produce renewable energy via photovoltaic systems installed on the roofs of drinking water tanks, mainly for self-consumption in water cycle management systems (pumps), thereby reducing energy consumption by 800,000 KWh/year.

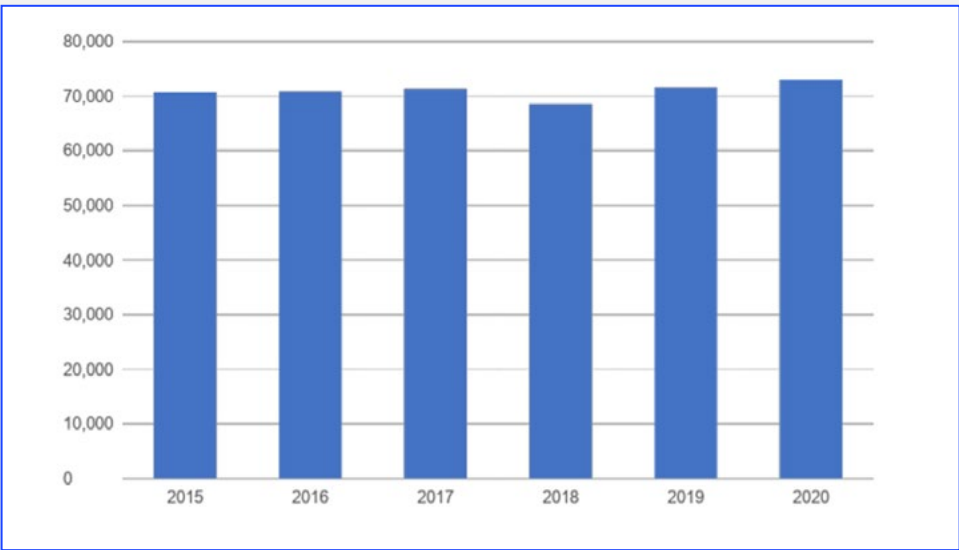
Malaga City Council is taking steps to raise awareness about water consumption and, moreover, to encourage users to change their behaviour. Water-saving tips also include preventing dripping taps, not flushing rubbish down toilets, fixing water leaks and making sure that stopcocks are closed gently.

Figure 1: Total water consumption (litres per capita/day) 2015-2020



Source: Urban Environment Observatory (OMAU)

Figure 2: Total amount of domestic water consumed per day (m³) 2015-2020



Source: Urban Environment Observatory (OMAU)

“The short-term goal (2020) is to achieve total consumption of 135 litres per capita per day and 125 by 2050.”

Moreover, the use of water-saving devices is recommended, e.g. flow regulators/aerators, flow reducers, flow switches for showers, water-saving showers, timer or push-button taps, taps with infrared sensors and pedal taps. However, water conservation also requires appropriate use of toilets, with the installation

of cisterns with flush interruption, dual push-button cisterns and fill limiters, to ensure that they are used correctly. Tourist establishments are regularly informed of such environmental initiatives.

Price of water per litre or cubic metre

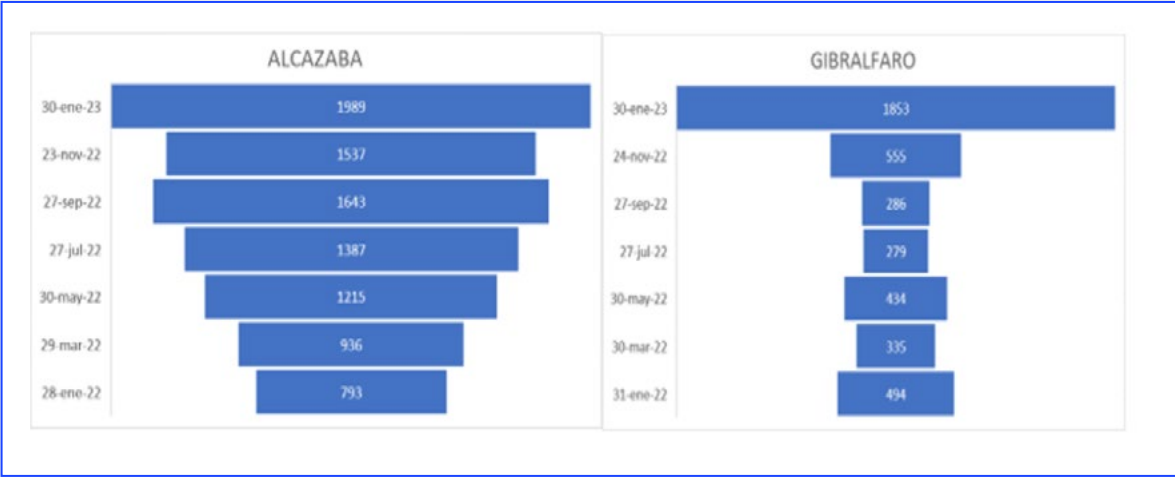
“EMASA is responsible for setting these tariffs, which are based on the principles of sustainable consumption and a change in its billing system.”

The water supply, sewerage and wastewater treatment tariffs are detailed in the Malaga Official Gazette (BOP). EMASA is responsible for setting these tariffs, which are based on the principles of sustainable consumption and a change in its billing system. The previous per household billing system has been replaced by a per occupant billing system. This means that households with more

members are no longer penalised for consuming equal amounts, thus avoiding any unfairness for consumers.

The FACUA Consumers’ Association analyses the billable fixed and variable charges for water supplies, sanitation, sewerage, wastewater treatment and/or disposal, including any possible fees or surcharges related to infrastructure improvements or droughts. It excludes rental and/or maintenance fees for meters, which are separate amounts (VAT is not included in the total amounts). As a benchmark, it considers monthly charges for a customer living in a household with a total of three members with a single 9 mm or 13 mm meter. In this study in 2022, two average levels of usage were established, 9 cubic metres (€12.51) and 13 cubic metres (€20.83).

Figure 3: Monument water consumption (M³ billed) from January 2022 to January 2023



Source: Department of operational services, internal affairs, beaches and festivals

Table 1: Consumption reduction targets

TARGETS	Total water consumption	Household water consumption
Short-term (2020)	<135	<110
Long-term (2050)	125	100

Source: Urban Environment Observatory (OMAU)

Water quality

“The drinking water quality was rated as Satisfactory during the period (2015-2020) and bathing water was rated as Excellent.”

In Andalusia there is a regulatory framework for the quality of water intended for human consumption, with tools and instruments being developed to guarantee and improve the quality of the water supply. For this purpose, there is a programme called the Andalusian Drinking Water Health and Quality

Monitoring Programme. The quality rating for water intended for human consumption is awarded by Malaga City Council through EMASA, with a Satisfactory rating being obtained for the period (2015-2020). This rating means that the water was rated as safe to drink in at least 95% of the tests.

In the case of seawater quality, the minimum quality standards for bathing water are laid down in Council Directive 76/160/EEC, Royal Decree 734/1988 and Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality. According to the classifications established in the aforementioned regulations, the bathing waters of the city of Malaga obtained the highest rating (Excellent) in the 2015-2020 period. The following bathing areas were rated as excellent: Baños del Carmen Beach, Campo de Golf San Julián Beach, Fábrica de Cemento Beach, El Candado Beach, El Dedo Beach, El Palo Beach, Guadalmar Beach, La Araña Beach, La Caleta Beach, La Malagueta Beach, Pedregalejo Las Acacias Beach, Peñón del Cuervo Beach, Sacaba Beach, San Andrés Beach.



04.

Conclusions

Water resources are very vulnerable to the effects of climate change. Forecasts of reduced rainfall and higher temperatures mean that local governments are considering implementing new water policies, promoting water conservation and efficient consumption, and encouraging water treatment and reuse.

Moreover, peak demand levels coincide with the periods with the lowest rainfall, i.e. the summer season, when water is consumed not only by local residents, but also by tourists. Golf tourism is a growth sector in Malaga, and it requires large amounts of water to water the courses. The current drought situation is making it necessary to take cost-saving measures, including banning the use of drinking water for street cleaning and the watering of gardens or golf courses, and shutting off supplies to drinking fountains and foot baths on beaches. The restrictions and measures adopted to manage this resource may therefore affect tourism and travel in the coming years. More efficient irrigation systems and investments to modernise irrigation systems are indicative of a trend towards seeking to decrease unit consumption, which needs to translate into a reduction in demand for irrigation. In this respect, a pricing policy aimed at penalising high usage will lead to a rise in water bill tariffs in the coming years. An increase of 6.21 euros is expected, of which 4.88 euros are due to a 35.25% increase in tariffs and the remaining 1.33 euros are due to a new charge, an additional 7.45% that Malaga City Council will start to collect from 2024 onwards.

This charge will be payable for 19 years and will gradually increase between 2024 and 2028. It will raise money to invest in infrastructure such as sewers, separate water systems and pumping stations. Moreover, information obtained on high consumption through the installation of smart meters will provide highly valuable data for water management.

“The effects of climate change and drought are jeopardising water quality and the development of tourism.”

Although this increase in prices and the planned investments in water infrastructure may be unpopular in society, they may enable us to achieve the 2050 target of reducing household consumption to less than 100 litres per capita per day. The wo-

rrying situation facing the city due to the drought is also making it necessary to carry out water-saving measures that are aimed at cutting the water supplied to the city by 20%. The measures that have been proposed to achieve this include: shutting off the water supply to drinking fountains and foot baths on beaches, preventing and repairing leaks, banning the use of drinking water in water parks and gardens, reducing water pressure, and using groundwater. It is also worth highlighting environmental education initiatives such as those organised by EMASA and citizen awareness programmes. Increased awareness about responsible water consumption would not only make it easier to meet the projected water consumption reduction targets, but would also be beneficial in tackling drought-related problems.

Furthermore, the effects of climate change could lead to a decrease in the quality of water resources. Increased evapotranspiration and the effect of rising sea levels, coupled with saltwater intrusion caused by declining groundwater levels and piezometric levels in aquifers, could put the city's water quality at risk. Additionally, water quality in reservoirs may be reduced due to lower oxygen concentrations as a result of increased algal vegetative growth caused by rising temperatures.





<https://sto.malaga.eu/indicadores/gestion-del-agua/>



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