Interview — Malta: water scarcity is a fact of life

Malta is one of the top 10 water-scarce countries in the world. What to do when nature provides only half of the water your population needs? Malta 'produces' clean water and tries to make sure that not one drop is wasted. We talked to Manuel Sapiano, from the Energy and Water Agency in Malta, about new technologies, water for households and agriculture, and the pristine bathing waters surrounding the island.

How do you tackle water scarcity in Malta?

Due to its geographical position, water scarcity is natural in Malta. The Mediterranean climate, with low levels of rainfall and high temperatures, results in low natural water availabilities and significant losses through evapotranspiration. Moreover, the density of the population in Malta is about 1 400 people per square kilometre. In other words, we have a low availability of water resources in a very densely populated area.

Nature can give only about half of our total needs. Since 1982, Malta has been 'producing' water through desalination of seawater. Desalination has been complemented by an extensive water leak management and repair programme that our public water utility has heavily invested in since the 1990s. As a result, our current municipal water demand is about 60 % of what it was in 1992, mainly thanks to leakage management. We also introduced last year an ambitious water reuse programme to further fill in the gap between supply and demand.

There are competing demands, given that Malta's natural water resources are limited. Urban residents or farmers ask for more water, but nature also needs water. Any water management plan we develop in Malta has to ensure that nature's needs for water are respected and met. Our valleys are hubs for ecosystems, some of which are endemic and hence of high ecological value. Therefore, there are areas in the valleys that are 'no go and no touch', because the fauna and flora living in those valleys — as well as their water requirements — have to be respected.

Isn't desalination a very expensive solution with significant impacts on the marine environment?

Unfortunately, since natural resources are not enough, 'producing' freshwater is a must and not a choice for us. Moreover, desalination as a technology has gone through significant changes in recent years, particularly in terms of energy efficiency. The Water Services Corporation (the Maltese water utility) is currently undertaking wide-ranging upgrades on all of its desalination plants —through the

EU's cohesion funding. The energy needed to produce 1 cubic metre of freshwater from seawater will be reduced to 2.8 kilowatt hours. Ten years ago that was close to 6 kilowatt hours. Desalination technology has become very efficient and the industry is continuously moving towards higher efficiency levels.

Regarding the impacts of desalination on the marine environment, this concerns mainly the discharge of brine, which is the by-product of the desalination process and is released into the sea. Our desalination plants are rather small and located in areas where there are strong marine currents. So the amount discharged is limited and gets diffused quickly. The water utility conducted preliminary studies on the discharge from our plants and found that the potential impact on the marine environment is limited to within the first metres of the discharge point. These results have already been taken on board and put into practice through more sustainable design of planned discharge facilities. These studies will now be continued through a LIFE integrated project.

The decision on where to install a desalination plant has to take into account many factors. The size of the plant is also important, not just from the point of view of the discharge, but also from the point of view of security of supply. Our three plants are strategically installed at different locations on the coast, mainly because, in the case of events such as an oil spill, when a plant needs to be shut down, the other two can remain in operation.

The geology of the area is equally important. The desalination plants in Malta source water through deep sea wells and hence rely on the purifying effect of the bedrock. This limits the need for pre-treatment, which in turn lowers production costs. This is an important planning aspect, since the cost of pre-treatment can be comparable to the cost of desalination itself.

Given scarcity by nature, how do Maltese citizens contribute to water-saving efforts?

Maltese citizens use around 110 litres a day per person, which is relatively low compared with other EU countries. But there are also new pressures to take into consideration. For example, up to 50 000 foreigners came to work in Malta in connection with its recent economic growth. The tourism sector has also been steadily growing and is estimated to contribute to an equivalent population of around 40 000 people. More people on the islands mean a higher demand for water. Furthermore, people have different water consumption habits. If you are accustomed to using 250 litres of water per day in a water-rich country, it is difficult to reduce it to 110 litres in a matter of days. The Energy and Water Agency is currently putting in place an extensive water conservation campaign, which takes into account such demographic and socio-economic trends to comprehensively address water demand management.

In this context, water pricing can certainly play a role. In Malta, the price for domestic residential users is already on the high side: users pay EUR 1.39 per cubic metre for the first 33 cubic metres

per year. When that quantity is exceeded, the price increases to EUR 5.14 per cubic metre. So this rising block tariff mechanism is an incentive in itself to limit water consumption.

Similarly, the market is helping people to consume less. For example, today it is very difficult to buy a new large-volume toilet flush-tank. When you buy a tap, most probably it will already have an aerator on it. Washing machines and dishwashers are increasingly water and energy efficient.

Recycling of water also has a big saving potential, which we have started to explore.

How will recycled water be used?

We are focusing on two systems: agricultural use and domestic use. The agricultural system, through polishing plants, plans to produce 7 million cubic metres of recycled water per year. This corresponds to one third of agricultural water use, according to our estimates.

At home, around 30-45 % of water is used for showering and a similar share for flushing. Using shower water, which is relatively clean, for flushing, where there is no direct contact with people, could reduce daily consumption from 110 litres to around 70 litres per person. The saving potential is immense, but our primary concern is always public health. The technology has to be safe, because ultimately it is about our health and our families' health.

What about using recycled water in agriculture?

Agriculture needs water. Pumping water directly from the underground aquifers is a relatively inexpensive and local solution. The problem is that Malta's aquifers are in direct contact with seawater and have limited abstraction capacity. Extracting large amounts of freshwater from the aquifers would result in the intrusion of seawater, lowering the overall quality of the groundwater and making it unusable. Needless to say, everybody loses in this case.

To regulate how much groundwater is extracted, almost all registered private boreholes have been fitted with meters in recent years. We now have a more complete overview of agricultural water use and needs. We can also offer an alternative supply for farmers: highly polished treated waste water — covered by the 'New Water' programme in Malta.

How do farmers react to the idea of using recycled water?

Perceptions play a big role here. We need to change the perception of 'recycled-treated' water as 'waste' water. To increase the uptake by the farming community, we explain the quality levels achieved by the new treatment process. We also show that using this water does not have any negative impacts on crops.

Pricing incentives are also used to this end. A rising block tariff mechanism is established for ‘new water’. The first tariff band does not apply to the agricultural sector for the time being to further the uptake of recycled water.

Another important measure is the development of small, in-field, rain water reservoirs. Since Malta joined the EU, there has been a big increase in the number of applications for the development of these reservoirs, supported by the EU’s Agricultural Fund for Regional Development.

How do EU initiatives and funds contribute to water management in Malta?

The water sector is one of the key priorities for Malta under the EU’s Cohesion Fund. We are currently focusing on a number of vertical investments in infrastructure: improving the energy efficiency of seawater desalination, the New Water programme, increasing the efficiency of water distribution, upgrading and regulating the sewage collection network, testing innovative technologies, water conservation campaigns and groundwater abstraction management.

These actions are then collated together within the water management framework established under Malta’s second river basin management plan through an integrated project. This integrated project is also financed by the EU LIFE programme and covers increasing awareness, encouraging the uptake of new technologies and new practices, and addressing governance issues. We are also exploring how we can share this knowledge with other islands and coastal areas in the Mediterranean through European and other regional initiatives.

What is the state of the marine waters around Malta?

Specific factors — such as our high population density and our intensive tourism sector, the use of the coastal zones and marine waters for commercial and recreational purposes — exert pressure on the marine environment. However, in recent years, there have been significant improvements, also mainly facilitated by EU funding and legislation. An important example relates to the improvement in the quality of our coastal waters — the latest results show that our bathing waters are ‘top notch’. Undoubtedly, the implementation of the EU Urban Waste Water Treatment Directive with three new plants contributed to this improvement.

We’re also looking into how to improve nutrient management in agriculture and reduce pollution from run-off. Coastal water quality is vital for Malta. Given Malta’s high population density, enjoying the sea during summer months is also part of our daily lives, so clean beaches and high-quality bathing waters are important not only for tourism but also for us.

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