Water Management Strategies, Lutz Johnen

ABOUT THE AUTHOR …

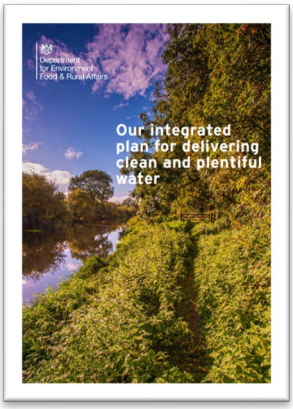
Lutz Johnen is the MD of Aquality Trading & Consulting Ltd and a founder-member and Chairman of the UK Rainwater Management Association.

THE FUTURE WATER MANAGEMENT CHALLENGE …

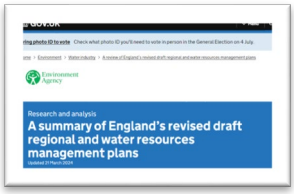
The long hot summer of 2022 and the equally long wet winter of 2023/24 serve to emphasise to the general public the changes to the UK's climate expected to be caused by global warming.

These changes to UK weather patterns have long been predicted by the Environment Agency which expects total annual rainfalls to remain broadly unchanged but in the future be distributed less evenly through the year. As a result, winter rainfalls are likely to become more intense, making them less manageable from a flood avoidance and water capture perspective, whilst long dry summers will lead increasingly to droughts. These increasing risks of both floods and droughts will be exacerbated by steady growth in the UK's population leading to increased urbanisation and demand.

According to DEFRA (2023), water undertakers supply approx. 14 bn litres of water for public consumption a day. It was previously estimated that by 2050 approx. 4 bn litres a day of additional water supply would be required to meet the demand in England. However, on 21 March 2024 the Environment Agency published a revised estimate, stating that the shortfall of nearly 5 bn litres per day by 2050 (EA, 2024), which represents over a third of the today's water supply in England.



Source: *Environment Agency (2024) A summary of England's revised draft regional and water resources management plans [online]. Available at: https://www.gov.uk/government/publications/a-review-of-englands-draft-regional-and-water-resources-management-plans/a-summary-of-englands-draft-regional-and-water-resources-management-plans Accessed on 06 April 2024*



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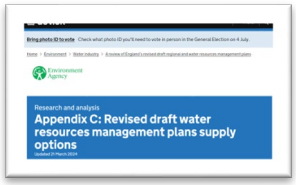


RESPONDING TO THE CHALLENGE …

In responding to these challenges, it will be necessary to build up over time the national capacity to resist both floods and droughts, rather than expect "magic bullets" to be found once at some time in the future when the impacts of both on the general public becomes a political issue. This need to build capacity is well illustrated by the long-term strategic programs already underway to achieve a "zero carbon" future many years hence.

At the moment there is limited to no sign of the UK taking a similar strategic approach to water management by taking significant action now to build-up future flood and drought avoidance. Although the water supply side of the equation is firmly on the Government's agenda, practical action has so far been muted, as best illustrated in the housebuilding sector where the emphasis is on marginally improving the potential of new homes to be more water efficient whilst horizoning into the distant future more ambitious measures such as water reuse. The urgency for need of significant change is illustrated by the example of Cambridge, where the

government wants to double the housing stock on the one hand to support business growth but can't proceed due to no water availability on the other.

Our European neighbours have shown which significant and save impact water reuse can have on water consumption. More European countries are following suit and are now embedding water reuse in their water strategies.

WATER REUSE …

Water reuse technologies are well-established in the UK, the first systems having been installed around the turn of the century; their use is even more widely employed on the Continent and, in particularly Germany which experiences similar supply concerns to the UK. Unlike the current Building Regulations approach which only covers domestic and seeks potential improvements through the introduction of more efficient fittings, water reuse technologies provide a certain and significant reduction in mains water consumption where fitted. They do so by substituting the reused water for mains water for, typically, toilet-flushing, clothes-washing machines and outside taps. Collectively these uses account for around 50% of domestic water consumption and around 75% of the water consumption in commercial buildings that do offer bathing or showering facilities.

This is achieved by one of two ways, both of which can be employed simultaneously if necessary to meet project requirements, namely by harvesting and reusing rainwater (RWH) and/or recycling.

Bath/shower and hand-wash waste greywater (GWR). Both approaches offer different operational characteristics with RWH being best suited to projects where the harvesting potential of the building is well matched to the potential use of the harvested water in the building. Conversely, GWR is at its optimum in buildings such as hotels and hostel accommodation where there is a good match between the wastewater from bathing and the water used for toilet flushing.

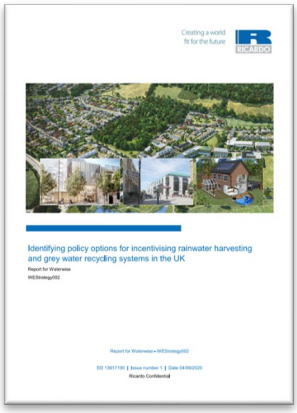
Since mandatory RWH was introduced in the Flandres region of Belgium for all domestic properties in 2005, the water consumption per person per day was reduced to 89 litres, compared to 130 litres per person per day in the neighboring Netherlands.

Similar measures should be considered in England to meet the legally binding target under the Environment Act of 20% reduction in domestic water consumption to 122 litres per person per day by 2038.

CONSTRUCTION SECTOR PROFESSIONALS …

Given the mains-water saving potential of rainwater harvesting and greywater recycling systems it is inevitable, and already the proven case in particularly water-stressed areas, the water re-use will play an increasingly more prominent role in helping to address future mains water supply issues.

As confirmed by Ricardo for Waterwise, RWH systems of all sizes and larger GWR systems have positive cost to benefit performance. As with most aspects of construction projects the incorporation of such technologies becomes more cost-effective the earlier, they are considered at the master planning stage, and designed-in, procured and installed by professionals that have a good understanding of the technology with which they are dealing. This understanding is relatively straightforward to acquire from the companies serving the water reuse sector.



Source:
https://database.waterwise.org.uk/knowledge-base/identifying-policy-options-for-incentivising-rainwater-harvesting-and-grey-water-recycling-systems-in-the-uk/