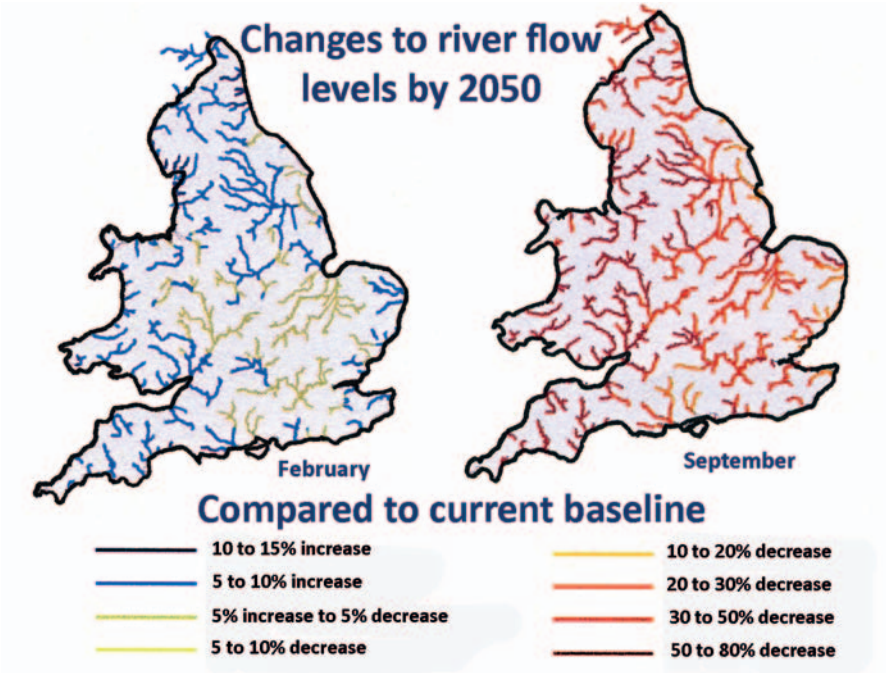
Derek Hunt founder member, UK Rainwater Management Association

A choice between floods or droughts?

Derek Hunt says sustainable drainage systems (SuDS) are only half of a solution and argues for better choices in surface water management

The recent regular occurrence of damaging floods has led to an understandable preoccupation with taking measures to prevent them, and a substantial ongoing national investment in activities such as river-dredging and the raising of flood defences. Whilst the political pressure on Government to be seen to be 'doing something' has proven irresistible, one side effect is that it makes watercourses more effective conduits for transporting the freshwater on which we depend out to sea.

Meanwhile, water supplies in England south of the Humber Estuary have been under significant stress for a number of years; a situation predicted by Government to worsen as the population increases, along with a corresponding need for more development to provide everyone with homes and jobs. Changing weather patterns, leading to heavier winter rainfall and drier summers, are also expected to increase future flood and drought risks.



Source: 2010 Environment Agency report 'Water for People and the Environment'

"water shortages will have a greater future adverse impact on the UK than flood risks"

Floods or droughts

Nowhere will the effects of increasing stresses on water supplies be more keenly felt than in the agricultural sector, where an early and dramatic deterioration in growing conditions is predicted. The natural environment will be similarly affected by water-related issues, as will people and water-dependent industries.

This potentially bleak scenario is shared by the International Panel on Climate Change (IPCC), whose latest report predicts that water shortages will have a greater future adverse impact on the UK than flood risks.

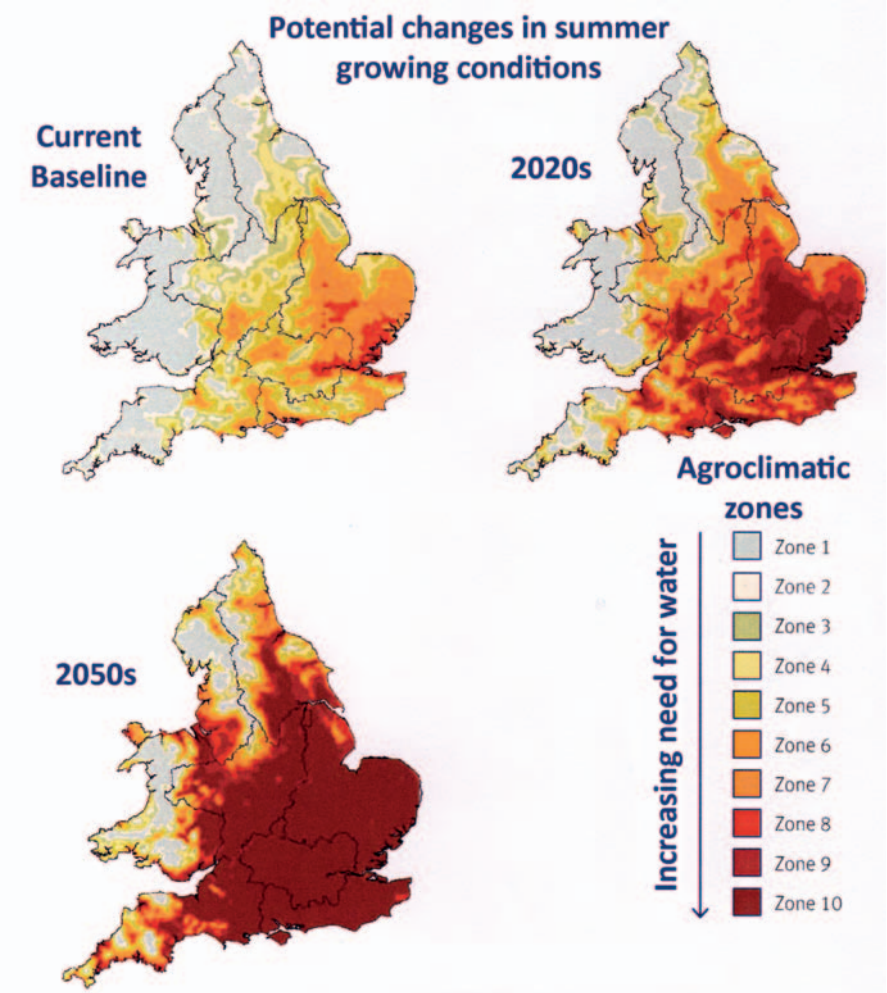
Re-thinking the problem

Addressing the twin future threats of increasing flood and drought risks will clearly not succeed if only half the equation is being tackled. This is particularly so if the water management tools being selected to avoid floods also serve to increase the later risk of droughts.

Equally obviously, tackling either or both requires a long-term, strategic approach, aimed at building the capacity needed to ensure that we can store all the rainfall needed to meet later needs. Usefully, storing more rainwater at the point it falls will have an immediate favourable side-effect of reducing downstream flood risk.

Source control

Given the stark predictions of the deteriorating water-supply situation for agriculture, it will surely be in farmers' own interests to increase farm-level water storage capacities to the volumes



Source: 2010 Environment Agency report 'Water for People and the Environment'

needed to meet summer needs. This could perhaps be encouraged by adaptation of an existing agricultural subsidy.

However, this single step would not of itself substantially improve the downstream flood risk situation, as the necessary storage capacity would fill early in the winter, and thereafter simply overflow. To provide both storage for re-use, and a means to avoid downstream flood risks, would require additional attenuation capacity. This would delay the release of water during rainfall events until downstream drainage infrastructure could cope.

This approach would reduce the cost of downstream flood defences, but increase the cost to the farmer beyond their own simple requirement for a water supply – a financial trade-off that should be relatively easy to balance.

More than SuDS

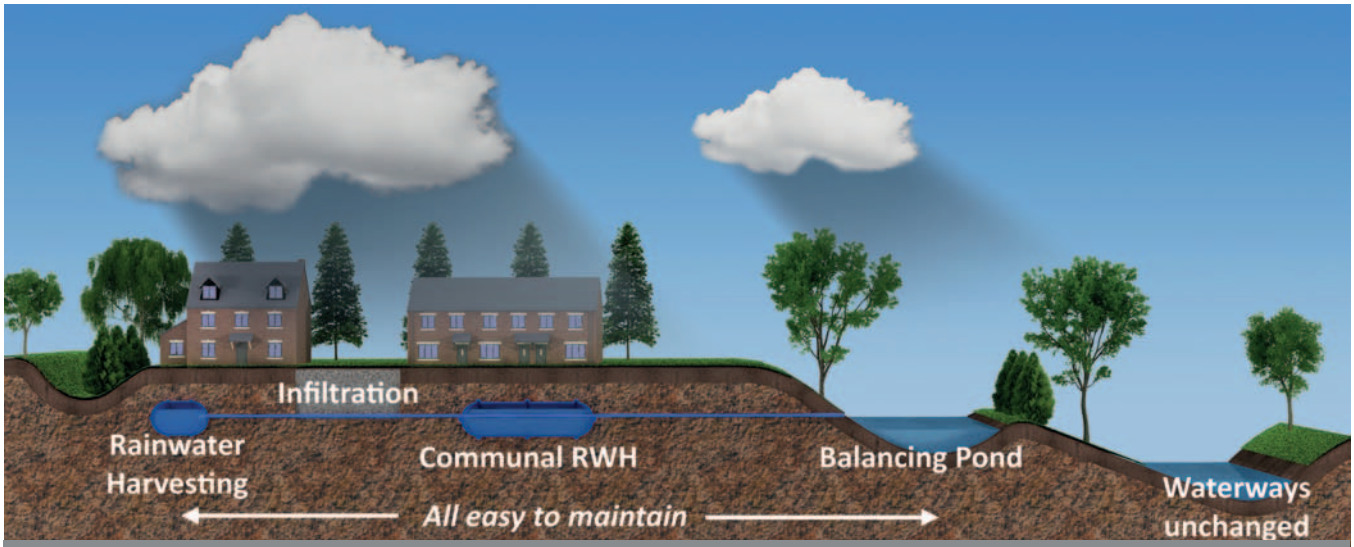
The urban equivalent of source control has been in place for many years, with the planning requirement that new projects must not increase pre-development downstream flood risks. This is achieved by incorporation of 'sustainable drainage systems' (SuDS), many of which are built around the attenuation principle outlined above.

However, as currently legislated, SuDS has no bearing on the water shortage side of the equation. By simply delaying the passage of rainfall until downstream drainage infrastructure can cope, it makes no contribution to water supply issues.

Policies at odds

This shortcoming has been addressed by the Welsh Government, whose policies recognise that fresh water is a valuable natural resource that needs to be managed accordingly. This is achieved through its published SuDS Standard, which identifies water storage for re-use as the highest priority measure for flood risk avoidance.

Similarly, the Greater London Authority recognises the very substantial pressures on water supplies in its relatively dry and highly populated area by mirroring the above policy in the London Flood Action Plan.



Sustainable drainage model including rainwater harvesting

Strangely, bearing in mind that both Scotland and Northern Ireland operate in a different rainfall-to-population density environment, this leaves only England out of step, with a national SuDS policy that fails to recognise a role for SuDS in addressing water-shortages – or even the need for it to do so. A very strange anomaly, given that the ratio of rainfall to population in south-east England is lower than that on the arid fringes of the Mediterranean.

The school solution

This anomaly could very easily be overcome by national policy encouraging developers to take an integrated approach to SuDS, and the storage of rainwater for non-potable re-use, along the lines illustrated at the bottom of the page opposite. On a typical housing development, this would result in nearly all the surface water on the larger properties being controlled at source, by a combination of water-sensitive design and the use of harvested rainwater for non-potable uses such as toilet flushing, clothes washing and the outside tap.

These systems would not require an additional attenuation capacity if they were designed to overflow into communal systems serving the needs of smaller properties, the roof sizes of which do not justify dedicated systems. This would serve to boost the availability of non-potable water to the smaller properties, which might otherwise be inadequate to meet consumption. It would also minimise eventual overflow losses to environmentally-friendly balancing ponds, designed to provide an attractive amenity and boost property values.

So why not ...

The main practical barrier to doing this on all new homes is that the developer bears the cost, whilst the home-occupier reaps the benefit of free water. This is less of a problem with many commercial projects, where the commissioning client and the end-user are one and the same.

So, to overcome current weaknesses with the national approach to managing surface-water, given the expectation of future heightened risks of floods and droughts, why not adjust national policies to:

- Integrate flood and drought risk management
- Encourage farmers to attenuate water at source
- Encourage developers in water-stressed regions to employ water re-use as the primary mechanism for meeting SuDS requirements

In other words, why not make better choices when it comes to managing such a valuable natural resource?

Contact www.ukrma.org

Note: Derek Hunt is also Managing Director of UKRMA member company Rainharvesting Systems Ltd

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