

# Working with Changing Weather



## about the author ...

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group, and a Director of the UK Rainwater Management Association.

## when it rains it pours ...

Given the well-publicised flood events of the last two winters, there now seems widespread acceptance that subtle variations in climatic conditions around the British Isles are causing significant changes to associated rainfall patterns. Although the net effect of these is likely to be minimal, with overall annual rainfall little altered from current levels, it is predicted that winter rainfall will increase in both amount and intensity, with summers becoming correspondingly drier.

The predicted effect of this on UK river levels shows peak winter flows rising by as much as 10 to 15%, whilst the already dry south-east of England experiences lower river levels even in winter, and as much as 50% lower in summer. The likely consequence of these changes will be increased future risks of floods and droughts with, according to the latest report of the International Panel on Climate Change, droughts posing the greater threat to people, the environment, and water-dependent industries such as agriculture.

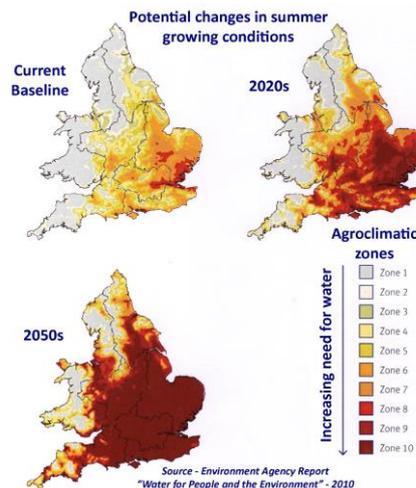
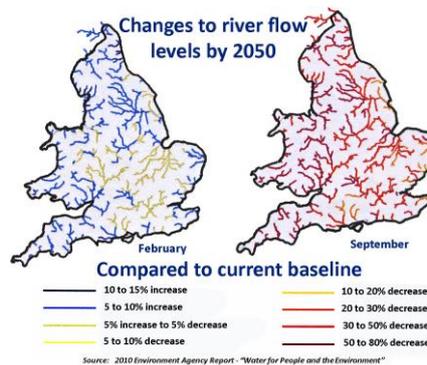
## saving our farmers ...

A major cause of floods is the water flowing uncontrolled across open countryside before draining into watercourses that cannot cope with peak flows, causing flooding and widespread damage. Currently the main strategy for dealing with this includes improving the efficiency of water-courses as conduits for getting water out to sea, a somewhat limited strategy that is counter-productive when water supplies

subsequently become the main issue.

An alternative approach is to control and store the water close to where it falls to provide a secure source of agricultural water for subsequent re-use. Simple farm-level reservoirs can be suitably designed to ensure that

they always maintain the capacity to hold-back peak flows, until water-courses can safely handle them, whilst also retaining the reserves necessary to sustain agriculture throughout the following summer.



## joined-up thinking ...

Advocating strategies designed to alleviate both flood risks and water-supply issues, is clearly an important priority for the urban environment as well. This imperative is compounded by predicted population growth of 20-million over the next 30 or so years, making ever

increasing demands on already stressed water supplies.

Associated housing and commercial development will in parallel potentially increase the risk of floods as previously free-

draining land is replaced by impermeable buildings, hard-standings and roads.

It is therefore good to see the Welsh Government taking a very welcome lead with its recently published Sustainable Urban Drainage Systems (SuDS) Standard which places storing rainwater for non-potable re-use as the number-one way of avoiding new developments increasing down-stream flood risks – at a stroke tackling both floods and water shortages at the same time.

The Greater London Authority (GLA) draft SuDS Action Plan takes a similar enlightened stance, strangely not echoed throughout the remainder of the UK.

### *best-practice ...*

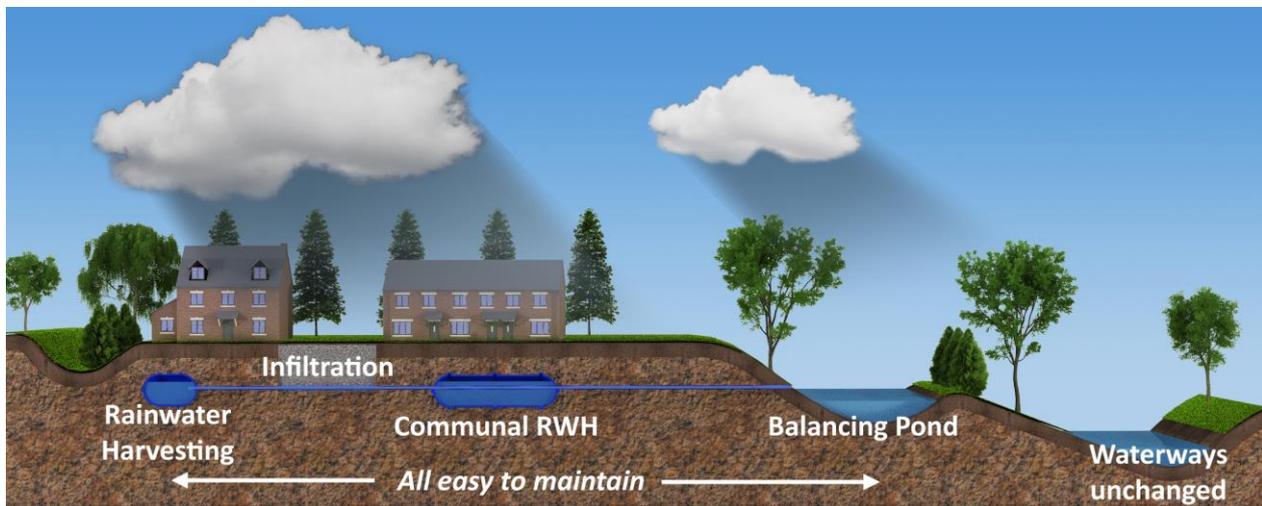
Following the Welsh Government and GLA approach, the challenge for Developers and their designers is to look for SuDS schemes that combine cost-effectiveness with added project value.

mains-water consumption for the property by around 40% - making an obvious contribution to overall water-supply issues.

Unavoidably, a sequence of rainfall events could cause the water available for harvesting to exceed the capacity of a single system's storage tank, which means it would need to be able to overflow whenever necessary. The obvious destination for this surplus water, is to supply the tank of a communal rainwater harvesting system serving higher density properties, which otherwise do not collect sufficient water to meet occupants' non-potable needs.

Any overflow from these also needs to be managed from a SuDS point of view, the most satisfactory destination being surface features such as balancing ponds or swales, which are straightforward to maintain and deliver accompanying environmental and amenity benefits.

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Typically, taking new housing as an example, in practice this would look to control as much of the rain falling on new individual properties at source, using a combination of rainwater harvesting, water-gardens and permeable paving. As well as helping to avoid increased down-stream flooding risk, re-using the harvested water for non-potable purposes such as toilet-flushing would reduce