

Facing-up to the Water Management Challenge



about the author ...

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a changing world ...

Flood events over the last two years, and the water shortages experienced in 2012, serve to add credence to Government forecasts that the patterns of rainfall in the UK are undergoing significant changes. Both forecasts and experience suggest that whilst overall levels of annual rainfall might not be affected, heavier winter rainfalls and drier summers leave parts of the UK more prone to floods and droughts respectively.

This theme is highlighted in the latest (2015) report of the International Panel on Climate Change (IPCC), which predicts both floods and droughts becoming an increasing problem for the UK. Surprisingly, given the alarming media images of recent floods, droughts are likely to cause the greater damage to the environment and economy in the long term.

tackling change ...

Less surprisingly, the public clamour is for Government to address immediate flood risks, rather than promote its long-term

approach to tackling floods and droughts. This in turn can lead to a lack of focus on approaches designed to produce long-term solutions.

Agriculture provides a good case-study of a sector where water shortages in the quite near future could have major consequences both for the industry itself, and the environment it helps to protect. The obvious concept for addressing this is to use excess winter rainfall to establish reservoirs of water close to the point of intended use, sufficient to meet the irrigation requirements of the following summer. To effectively meet the challenge, this needs planning and

investment over strategic timescales.

the attenuation bonus ...

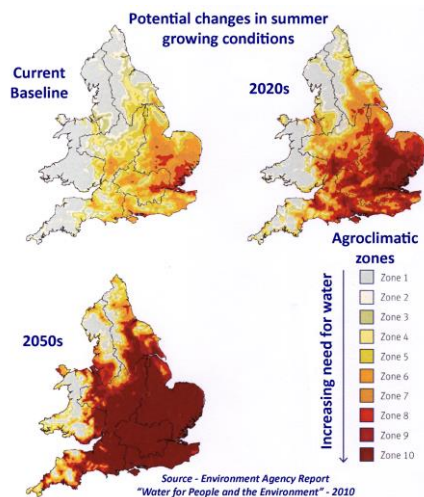
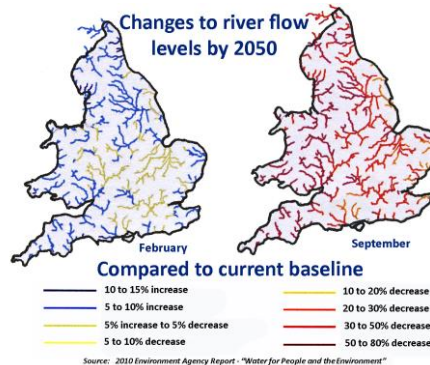
A very significant bonus from retaining water at source in this way, for drought avoidance reasons, is that it can play a major role in avoiding down-

stream floods. This can be achieved by careful design that uses farming-related

reservoirs for both storage and attenuation purposes, the latter serving to delay the flow of rain whilst it is falling for later release when waterways can cope without causing flood risks.

This principal is, of course, already well-established in the context of urban developments, where it is a planning requirement that new buildings, and

infrastructure such as roads, must demonstrate that their construction will not increase down-stream flood risks. Titled sustainable urban drainage (SuDS), this can be achieved in a variety of ways, very often involving temporarily reducing (attenuating)



peak water flow and volume rates until downstream infrastructure can deal with it.

joining the dots ...

The current national approach to managing rainfall seems at best anachronistic, with attenuation being well-recognised as a necessary part of addressing flood-risks arising from new developments, but no national priority being given to making use of the water concerned to help alleviate later potential water shortages.

Conversely, although practical and imminent pressures on future water supplies seem certain to drive investment in storing water for agricultural re-use, only limited consideration is given to how this should interact with flood-planning.

Even the most cursory assessment would indicate the need for integrated planning and investment in relation to managing rainwater as an important natural resource. In short, an approach that takes into account both rural and urban landscapes, avoids floods, and meets the need for water of people, industry and the environment.

setting standards ...

At the moment, the Welsh Government is taking the lead in this respect, its draft SuDS code of practice explicitly recognising the need to manage rainwater in ways that recognise its value. This results in their code identifying storing water for re-use as the best way to avoiding flood risks.

This may seem a somewhat obvious conclusion, but it is not one that has been drawn by the equivalent code for England, where water re-use is not identified as an option at all. This is doubly odd, given the disparity of water resources and demand between Wales, and most of England south of the Humber.

Even within England there are further anomalies with, for example, the draft SuDS code for London mirroring the Welsh, rather than English, version. If nothing else, this inconsistency makes life challenging for the construction industry which needs to respond to different codes in different parts of the UK.

the cost driver ...

The main reason for these differences is perhaps driven by the construction industry itself which, understandably, is anxious to eradicate avoidable costs and complexity. For some reason, the UK construction sector has failed to mirror the creativity of our Continental counterparts in this respect, when it comes to managing rainwater cost-effectively.

For the last 10 or so years, it has been common practice in the UK to treat storing water for re-use as a separate issue from SuDS, in the process broadly doubling both complexity and costs by installing two separate systems. By contrast, Continental practice has been to design much more cost-effective combined systems.

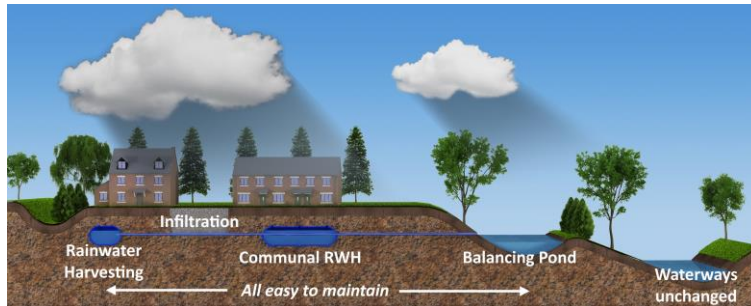
nature will win ...

As rainfall patterns change, in line with Government and IPCC predictions, damaging water shortages will gain a higher public profile, leading in turn to further reviews of SuDS standards; the smart money would be on the views of the Welsh Government and the Greater London Authority gaining greater future ascendancy.

Damagingly, this will take time to come about, time that could more usefully be spent incrementally developing the coherent and cost-effective flood and drought avoidance capacities that will be required to meet future rainfall patterns.

best practice illustrated ...

Meanwhile, best-practice is already available now for developers with the foresight to look for cost-effective designs, along the lines illustrated.



Using a new housing development as a typical example, rainwater should be controlled at source insofar as possible using an optimum combination of a rainwater harvesting (RWH) system, a water-garden, and infiltration (the effectiveness of which will vary with ground conditions).

In periods of prolonged or heavy rainfall, the storage tank for the RWH system would need to be able to overflow, the obvious destination being to a communal RWH system serving higher-density properties. When necessary, these in turn would overflow to easily-maintained surface features such as swales or ponds, providing added-value amenity features to the site.

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