

## *a better way to manage a scarce natural resource ...*



### *about the author ...*

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### *farmers in the vanguard ...*

The first to feel the effects of these water supply stresses are expected to be farmers and, more generally, the wildlife and biodiversity that depends upon agriculture. Water shortages are being predicted to affect the livelihoods of farmers progressively over the next few years, particularly in most parts of England south of the Humber estuary.

### *water, a valuable natural resource ...*

A nice warm, dry and sunny May, broken towards the end of the month by tropical-scale thunderstorms, neatly highlights the need to manage two sides of the UK's rainfall to ensure adequacy of supplies, whilst also avoiding floods.

For a number of years the supply side of the equation has largely been overlooked, but has now been brought back into sharper focus by recent Environment Agency warnings that already existing stresses on water supplies are likely to worsen as the population continues to grow. Changing weather patterns, such as the May sunshine and thunderstorms, are also predicted to increase future risks of both floods and droughts; according to the IPCC, it is the latter that will eventually prove to be of greater significance.

The month of May might therefore become an increasingly typical example of future weather patterns, and the water management challenges these pose. Prolonged dry spells place pressure on water supplies but when, in due course, the rainfall arrives it does so with unmanageable intensity.

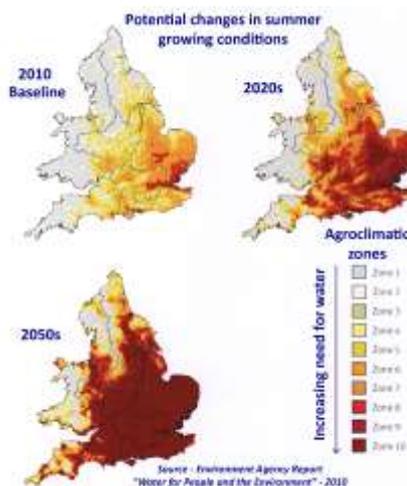
Understandably, flood risks then become the immediate top priority, the general aim being to usher the temporarily excess water out to sea as quickly as possible, rather than capture it for later use. Ironically, this means that the dry spells and the increased intensity of rainfall, both contribute to further pressures on water supplies.



To protect the productivity of their land, farmers are therefore increasingly turning to farm-level catchment and storage of winter rainfall to provide, or supplement, their summer requirement for water. As the stresses on supplies grows in the next few years, it can be expected that the scale of this already established practice will grow significantly.

### *taking an integrated approach ...*

The thought immediately occurs that if water is being captured across the land in this way, surely this will be helpful in reducing downstream flood risks; sadly not. Water capture for re-use in this way is uncoordinated and left entirely to the initiative of individual farmers (albeit encouraged by the NFU). This means, typically, that by late Autumn each individual farmer will have filled their storage to its capacity; for the remainder of the winter it will therefore simply overflow, leaving the downstream flood risks unchanged.



To form an effective part of flood-planning, farm level water storage arrangements would need to include an attenuation capacity, that is capacity beyond what is needed by the farmer. This spare capacity can then fill during peak weather events, but subsequently be allowed to dissipate over time at a rate with which downstream

infrastructure can cope. The extra cost of this attenuation capacity would currently fall on the farmer, rather than the downstream urban areas that would reap the benefit; few farmers could be

expected to volunteer to carry costs for third-party benefits.

For the development of countryside water catchment that includes attenuation to unfold, an important driver is already in place, namely the need of farmers to harvest winter rainfall for re-use when required. But it will not happen without two further essential ingredients; first, the need for all concerned to take an integrated approach to floods and droughts, rather than treating them as two unconnected issues; and secondly, a funding mechanism would be required for the attenuation aspects of the storage.

### *for town and country ...*

These same principles, of helping to address both flood and drought risks by taking an integrated approach, applies just as well to urban areas as to the countryside. Current plans for the water companies to maintain adequate water-supplies for domestic, commercial and industrial uses include the major infrastructure projects needed to store more water, and to transfer it from water-rich to water-poor regions. Even desalination appears to be on the agenda, a laughable proposition for a water-blessed nation that spends half the year encouraging its fresh water supplies to go to sea to avoid floods.

The preoccupation with floods already means that every new development – and a rising population means we need ever-more homes and jobs, together with the buildings that go with them – must meet strict rules for ensuring that new buildings and their surrounding hard-surfaces do not add to local and downstream flood risks. Often, these requirements are met in part, or sometimes fully, by installing attenuation tanks on the development. These collect rain whilst it is falling, to release slowly later when the downstream drainage infrastructure can cope, in the same way their rural equivalents could if suitably designed.

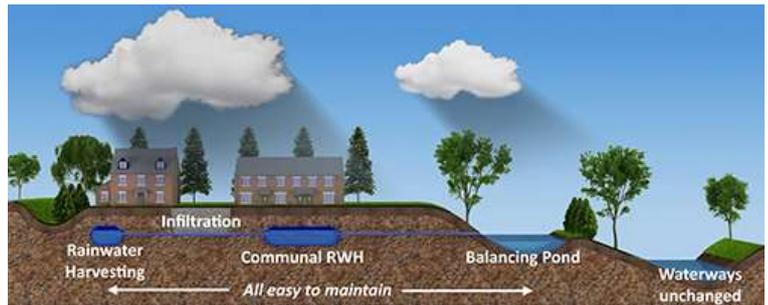
Instead of simply letting this water drain away, it could alternatively, and inexpensively, be used to help meet the toilet-flushing and other non-potable requirements of the structures being built.

### *the school solution ...*

As matters stand, farmers are currently approaching their management of water from the perspective of shortages, and the link with reducing flood risks is not being drawn; conversely, Planners (with the

honourable exceptions of the Welsh Government and the Greater London Authority) are approaching water management from exactly the opposite perspective.

An obvious first step in the right direction would be to bring both these perspectives together and ensure that countryside and urban management of surface water are integrated properly. Then, recognition that floods and droughts are two sides of the same water management coin, the management of which also needs to be integrated, would enable sensible decisions to be made.



Doing so would inevitably modify the economics and effectiveness of managing national water resources, particularly if the common sense approach of storing and re-using water at the point it falls, for non-potable re-use, is recognised. This would serve to assist both sides of the water management equation. Integrating attenuation capacity, plus other water-related requirements such as fire-fighting reserves, into the associated water storage tanks would then lead to much more cost-effective solutions.

For every new home fitted with an inexpensive water re-use system, typically used for toilet-flushing, clothes washing and the garden tap, the mains-water used by the property reduces by around 50%. On commercial properties, such as offices, exhibition venues and stadia, which have large roofs and potentially a high demand for the use of non-potable water, the mains water savings become even greater, leading to financial benefits too.

Completing the water re-use picture, on buildings with a high occupancy to roof area ratio, such as hotels and hostels, greywater recycling systems come into their own, there being a very good match between the creation of grey-water, typically from baths and showers, and the demand for water for toilet-flushing.

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