Why the UK needs a National Rainwater Management Strategy.

The need

Rain is a plentiful natural resource in the UK, yet it is ubiquitously wasted and undervalued.

We have no national strategy setting out an effective way of capturing and reusing this precious resource where it lands on impermeable areas such as property roofs and highways.

At one extreme, the absence of managing rain where it lands leads to the need for large, carbon intensive centralised infrastructure to move it great distances to where it is demanded, putting enormous peak loads on single points of failure.

At the other extreme the absence of managing rain where it lands leads to widespread flooding (from both rivers and sewers). Failure to effectively manage it on a day-to-day basis is also at the heart of the widespread public concern over the existence and operation of storm overflows in the UK.

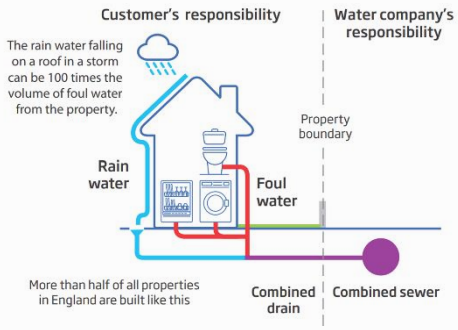
The need for a National Rainwater Management strategy has never been more critical, with climate change leading to a warmer atmosphere, increasing probabilities of weather extremes such as summer droughts and heavy thunderstorms and wetter winters with more flooding[1].

It has recently been estimated that nearly 1.8m properties will be at high (1-in-30) risk of surface water flooding by the mid-21st century[2]. A further 4.3m will be at medium and low risk. A further 640,000 properties will be at high risk from river and coastal flooding.

It is concerning that the current national approach[3] provides no overarching strategy for managing rain better where it lands – mentioning the opportunity to harness it first just once and with no commitment to return it as locally as possible to the environment.

Case study: How not to address the issue of storm overflows

Rather than responding proactively and imaginatively in the way we manage rain, the nation's drainage infrastructure is mostly a combined sewerage system with over half of all properties and many highways mixing clean rain with foul sewage.



However, instead of tackling this problem at its source, the current primary strategy for dealing with this single issue is building increasingly larger and larger end-of-pipe concrete storage tanks designed to store rain mixed with sewage until the rain subsides. It is then pumped back to treatment works for treatment. Treating this rain is not only an unsustainable use of power and chemicals, but it is also a waste of this precious natural resource.

The "sewage scandal" is not so much a scandal about sewage, it is a scandal about the absence of vision, understanding and willingness for the wholes of society to address how to manage rain where it lands.

[1] Effects of climate change - Met Office

[2] National assessment of flood and coastal erosion risk in England 2024 - GOV.UK Table 14

[3] Environment Agency – National Flood and Coastal Erosion Risk Management Strategy for England

With the growth strategy for the UK, how we build new properties is key to a sustainable future. Other countries (see Annex 1) have more mature strategies and are beginning to reap the benefits.

What would a national rainwater strategy look like?

A national rainwater management strategy should be framed around the two simple principles of good rainwater management[4], namely:

1) Rain should first and foremost be treated as a resource, captured locally, and reused where possible,

2) Rain should be returned to the environment as close as possible to where it first lands (and should never be allowed to mix with sewage).

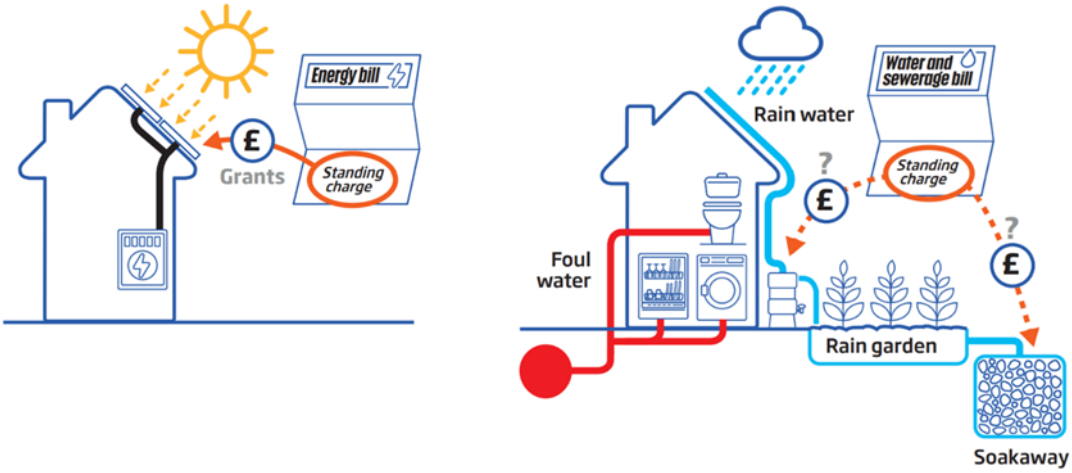
Managing rain better where it lands would offer substantial benefits compared to the current direction of travel being adopted to address storm overflows.

In effect, such a strategy would help the nation move from a centralised approach – where most properties are entirely reliant on third parties to provide their water and drainage services, to enabling a more **decentralised** approach – one which is less reliant on third party provision and encourages more property level independence and self-sufficiency – thereby flattening maximum demand peaks for water supply (by being a partial self-supplier of water for non-potable purposes) and supply peaks for drainage (by keeping more or all of the rain on premise).

Decentralisation of utility services for greater climate change resilience

It is noteworthy that such an approach has been adopted by Government for energy efficiency whereby billpayers' energy standing charges are used to fund/subsidise property level energy improvements such as solar panels etc.

However, there is currently no such direction provided for improved property rainwater management:



This decentralised approach to energy management is also echoed in Government's National Planning Policy Framework (paragraphs 165 and 166) which expects plans to identify opportunities for development to draw its energy supply from **decentralised**, renewable or low carbon energy supply systems. However, despite one of its 3 overarching

[4] Section 2.5 of the Government's Storm Overflows Discharge Reduction Plan

sustainable development objectives being “to use natural resources prudently” (para 8c), the NPPF does not even mention better rainwater management as a way of achieving this.

The multi-layered benefits of a national rainwater management strategy

Managing rain better where it lands provides far wider-reaching environmental and societal benefits than addressing the problems caused by too much or too little rain than the current siloed approach of tackling issues individually.

The stacked benefits of this strategy include addressing water scarcity, water resilience, fluvial, pluvial and sewer flooding, storm overflows, river water quality and reducing carbon footprints. Annex 2 details these.

The main obstacles to a national rainwater management strategy:

- **Legislative barriers and siloed approaches**

A national rainwater management strategy requires a holistic catchment-based approach led by policy makers across Government departments responsible for housing, new development, transport and highways, local authorities, farming and land management, building regulations and environmental regulation.

Current strategies for managing rain are not joined up.

They either consider rain as an asset[5] or a liability[6] - when the truth is that wherever it lands, it is both. They are also targeted at upstream/downstream responsible bodies and centralised assets as solutions – rather than targeting rain where it lands.

There are numerous pieces of legislation that need addressing (and many of them already recognised by Government) that would enable and encourage more decentralised solutions.

Some of these legislative barriers and suggested solutions are listed in Annex 3.

- **Regulatory barriers**

Regulation[7] focuses on the water sector as opposed to organisations or individuals with responsibilities for managing rain.

However, the level of focus on how to build or retrofit infrastructure at property or upstream landholding level to meet the two good rainwater management principles is entirely missing from the guidance for these plans. Instead, the planning frameworks incorrectly assume that optimal solutions are within the gift of the supplier of water (water companies) and collectors of rain (Environment Agency, local authorities and water companies) rather than being solvable by the landowners where the rain falls.

Driven by the regulatory framework, water companies are forced towards low-risk, short-term solutions (see case study above) whereas managing rain better where it lands requires co-operation from multiple stakeholders and can be more complex and take longer to implement, leading to higher risks.

[5] Water Resources Management Plans/

[6] National Flood and Coastal Erosion Risk Management Strategy / Local Flood Risk Management Strategies / Drainage & Wastewater Management Plans

[7] Water Resources Management Plans / Drainage & Wastewater Management Plans

Additionally, current building regulations[8] neither mandate rainwater harvesting nor sustainable drainage for new or re-development.

- **Economic barriers**

There are currently no economic incentives for existing property or highways owners to capture and reuse rain where it lands and then return it locally to the environment. The cost of the infrastructure versus the economic gains from using less water and requiring less of a drainage service, means such returns on investment are too long.

However, with better legislation, building regulations and economic incentives, decentralised domestic rainwater management could evolve as illustrated in annex 4.

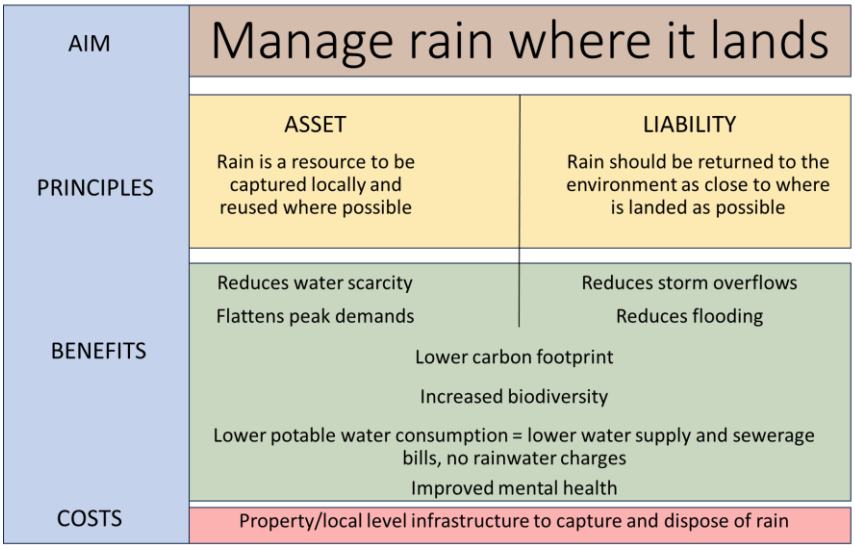
Siloed funding means siloed and sub-optimal solutions. With a national strategy, opportunities for pooling funding arise. So the £2.4bn/year[9] over 25 years earmarked by water companies for storm overflows – mostly on stormwater storage tanks, the £2.8bn/yr[10] from 2030-2038 to improve water resource resilience – mostly on reservoirs and the c£1bn/year[11] Defra allocate to fluvial and pluvial (and coastal) flood management could be better allocated to managing rain where it lands, rather than upstream or downstream where most of it is currently allocated.

Summary

Unless and until policymakers recognise the systemic nature of issues caused by too little or too much rain, investment will be delivered in siloes and are unlikely to meet the needs of society and the environment with a changing climate.

However, a national rainwater management strategy would provide a framework from which legislative, regulatory and economic barriers could be addressed.

Single slide summary:



[8] Building Regulations: Document G: Water efficiency / Document H: Drainage

[9] Storm Overflows Discharge Reduction Plan Total cost £60bn over 25 years

[10] PR24-final-determinations-Major-Projects-development-and-delivery.pdf page 23: assuming £2bn (2025-30) AMP8 and £22bn for delivery 2030-2038

[11] Funding for Flood and Coastal Erosion Risk Management (FCERM) March 2023 - GOV.UK

Annex 1: International examples of managing rain locally

Australia. The regulatory environment for water reuse in Australia is much more favourable to enabling implementation. Clear legislative guidance has resulted in 34% of properties adopting Rainwater harvesting systems providing 177 billion litres of water, accounting for 9% of the total residential water use in the country.

Thanks to clear guidance, 1.7 million properties now have rainwater harvesting installed. National guidance within Part B6 of the National Construction Code outlines the performance requirements for designers and installers at a national level. Australia is an example of where clear legislation on water reuse has enabled central government to successfully reduce water demand.

Germany. Clear guidance on the required performance specifications of reuse systems, opportunities for financial returns on reduced surface water charges, and financial subsidies for installing systems has resulted in high uptake of water reuse in Germany. One third of all German buildings now have RWH installed. The European Drinking Water Directive offers clarity for developers. The directive states any water which is not used for drinking or bodily hygiene can be replaced with a reclaimed supply of non-potable water. The guidance helpfully details minimum requirements for water reuse, particularly relating to irrigation purposes.

Belgium. Since 2004, mandatory rainwater harvesting for new buildings and major renovation projects in Belgium (Flanders) has enabled a significant decreased of mains water through rainwater for non-potable purposes. Since legislative changes in July 2022, rainwater reuse has through new legislative changes (Blue Deal) in July 2020, rainwater reuse was further pushed to increase from 4 to 8 million litres per day. Clear legislative guidance was introduced as part of the "Blue Deal" which sought to improve resilience to climate change. These changes clearly signal the positive impact mandatory legislation can have on water resources.

France. French legislators have recently introduced new legislation as of July 2024 to promote the use of water reuse for non-potable purposes. The R. 1332-94 of the Public Health Code covers the design, quality parameters, commissioning, and maintenance of reuse systems to offer clarity for developers and installers.

Ireland. Ireland has a national strategy for Nature Based Management of Urban Rainwater and Urban Surface Water Discharges. However, whilst recognising the benefits of sustainable drainage, neither the strategy nor the National Planning Framework 2018 promotes the resources benefit of better rainwater management where it lands.

Annex 2: The multi-layered benefits of a national rainwater management strategy

<table>
<tr><th>Water resources</th><th>Drainage</th></tr>
<tr><td colspan="2">Economic benefits for customers</td></tr>
<tr><td>Effective decentralised rainwater management lowers long-term costs for centralised infrastructure by reducing the need for new reservoirs, water treatment facilities and bigger pipe networks. These reduced costs are passed onto customers.

Capturing and reusing rainwater, households can reduce their water consumption, leading to lower water bills.</td><td>Effective decentralised rainwater management lowers long-term costs for centralised infrastructure by reducing the need for new network storage and bigger wastewater treatment facilities. These reduced costs are passed onto customers.

Capturing and reusing rainwater also drives down the size of variable sewerage charges (as these are linked to the volume of water consumed) and disconnecting rain from public sewers removes rainwater charges.</td></tr>
<tr><td colspan="2">Economic benefits for society</td></tr>
<tr><td colspan="2">Implementing domestic level infrastructure for rainwater management creates opportunities a plethora of small businesses across the UK to help decentralise rainwater management so each home becomes a natural resource capture system and manages the surplus. With investment in skills training and a new market, this would quickly become green employment creation on a large scale.</td></tr>
<tr><td colspan="2">Carbon footprint reduction</td></tr>
<tr><td>A reduction in potable water demand (through improved self-supply) will reduce the need to unnecessarily treat water not being used for drinking water purposes.</td><td>A reduction in off-site rainwater disposal will reduce the amount of stormwater that needs to be pumped and treated.</td></tr>
<tr><td colspan="2">Property level separation-at-source solutions have lower embodied and operational carbon footprints compared to traditional downstream grey infrastructure solutions.</td></tr>
<tr><td colspan="2">Climate resilience</td></tr>
<tr><td>Flattening the peaks of water demand and peaks of rainwater flow reduces pressure on centralised infrastructure and improves resilience in times of stress.</td><td>Improved local rainwater management will help mitigate the impacts of climate change by reducing flood risk and enhancing water availability during dry periods.</td></tr>
<tr><td colspan="2">Biodiversity Net Gain</td></tr>
<tr><td colspan="2">Better rainwater management can enhance biodiversity by reducing pollution and creating new habitats through the adoption of greener nature-based solutions to manage rain</td></tr>
<tr><td colspan="2">Mental health benefits</td></tr>
<tr><td colspan="2">An increase in greener spaces in urban areas as well as nature-based solutions connecting humans to their environment, will have a positive impact on mental health and wellbeing.</td></tr>
<tr><td>Fewer restrictions on water use</td><td>Reduced flooding and storm overflows</td></tr>
<tr><td>Lower demand in peak periods will reduce water use restrictions due to property level self-supply for non-potable usage.</td><td>By storing and disposing of rainwater where it lands, the frequency and volume of flooding and storm overflow discharges can be significantly reduced, leading to improved water quality in rivers and seas and reduced public health risks associated with recreational or aquaculture use of water bodies.</td></tr>
</table>

Annex 3: Addressing legislative blockers:

	Issue	How could it be resolved?	Has the blocker be recognised by policy makers?
Rainwater capture and reuse			
	New properties do not have to be built with infrastructure to capture and reuse the rain landing on them.	Amend Building Regulations Approved Document G to mandate, Code of Practice: BS EN 16941-1:2018 On-site non-potable water systems - Systems for the use of rainwater.	No
Rainwater disposal			
	New properties are not required to be constructed with infrastructure that enables the rain to be returned to the environment as close to where it lands as possible	Enact Schedule 3 of the Flood and Water Management Act making sustainable drainage for new development mandatory. Note this would need taking down to property level (current level is >1 house and >100m^2 of area connected). The automatic right to connect rain to sewers carrying sewage (Section 106 Water Industry Act) would have to be amended to be made conditional on downstream asset owner acceptance.	Yes. In the Storm Overflows Discharge Reduction Plan (Sept 2023)
	Redevelopment: Existing properties do not have to reduce the amount of rainwater being added to sewers carrying sewage when undergoing modifications affecting connected impermeable areas.	Building Regulations Approved Document H cover rainwater drainage provision but should require rainwater capture in the first instance (see above) followed by disposal via the SuDS hierarchy. A stated expectation of net reduction of rainwater flow off the site from historical levels should be required.	
	Water companies cannot disconnect privately owned pipes carrying rain and provide private property level soakaways	Amend Section 114A of the Water Industry Act to provide conditional powers to require such modifications to enable decentralisation of rainwater management through construction of private assets	Yes. In the Storm Overflows Discharge Reduction Plan (Sept 2023)
	Highways: A rainwater drainage service is an unchargeable service between a sewerage undertaker and highway authority	Section 115 of the Water Industry Act. This currently removes economic incentives for local authorities to disconnect rain from highways connected to combined sewers. The sewerage undertakers' customers currently pay for this highway rainwater drainage cost within their standing charges. This should be reviewed so that the user of the service pays the provider of the service to provide fiscal levers for rainwater removal from pipes carrying sewage.	
	Assessing the role of highway drainage as a rainwater drainage system.	Flood Risk Planning Practice Guidance sets out a hierarchy of drainage options to discharge rainwater runoff, as follows: • into the ground (infiltration); • to a surface water body; • to a surface water sewer, highway drain, or another drainage system; • to a combined sewer. In practice however, highway authorities refuse to allow connection to highways drains. There is no legal obligation for them to do so nor any mechanism in place for them to recover revenue for the service. This can steer developers to connect rain to the combined sewers. This needs to be addressed to enable highways drains to be part of the rainwater drainage network.	Yes. In the Storm Overflows Discharge Reduction Plan (Sept 2023)
	Providing a right to discharge rain to watercourses	Drainage Infrastructure providers such as sewerage undertakers and developers should be enabled to discharge new and existing rainwater to the nearest watercourse (where discharge to ground is not possible). Currently they have no rights to do this, and riparian owners can either prevent or demand prohibitively high fees for discharges. This makes separation of rainwater from combined sewage systems a costly or impossible option. A conditional right to discharge should be enabled – similar to the right that highways authorities enjoy under Section 100 of the Highways Act	Yes. In the Storm Overflows Discharge Reduction Plan (Sept 2023)

Annex 4: The evolution of better rainwater management in the home

1. How most properties in the UK were built (pre 1960s)

2. CURRENT POSITION: Separate drainage (since the 1960s) – but end of development connections allowed from rainwater sewer to foul sewer

3. CURRENT POSITION: Separate drainage and local disposal – though sustainable drainage is still not mandatory

4. Rainwater reuse and local disposal

5. Full rainwater reuse and local disposal