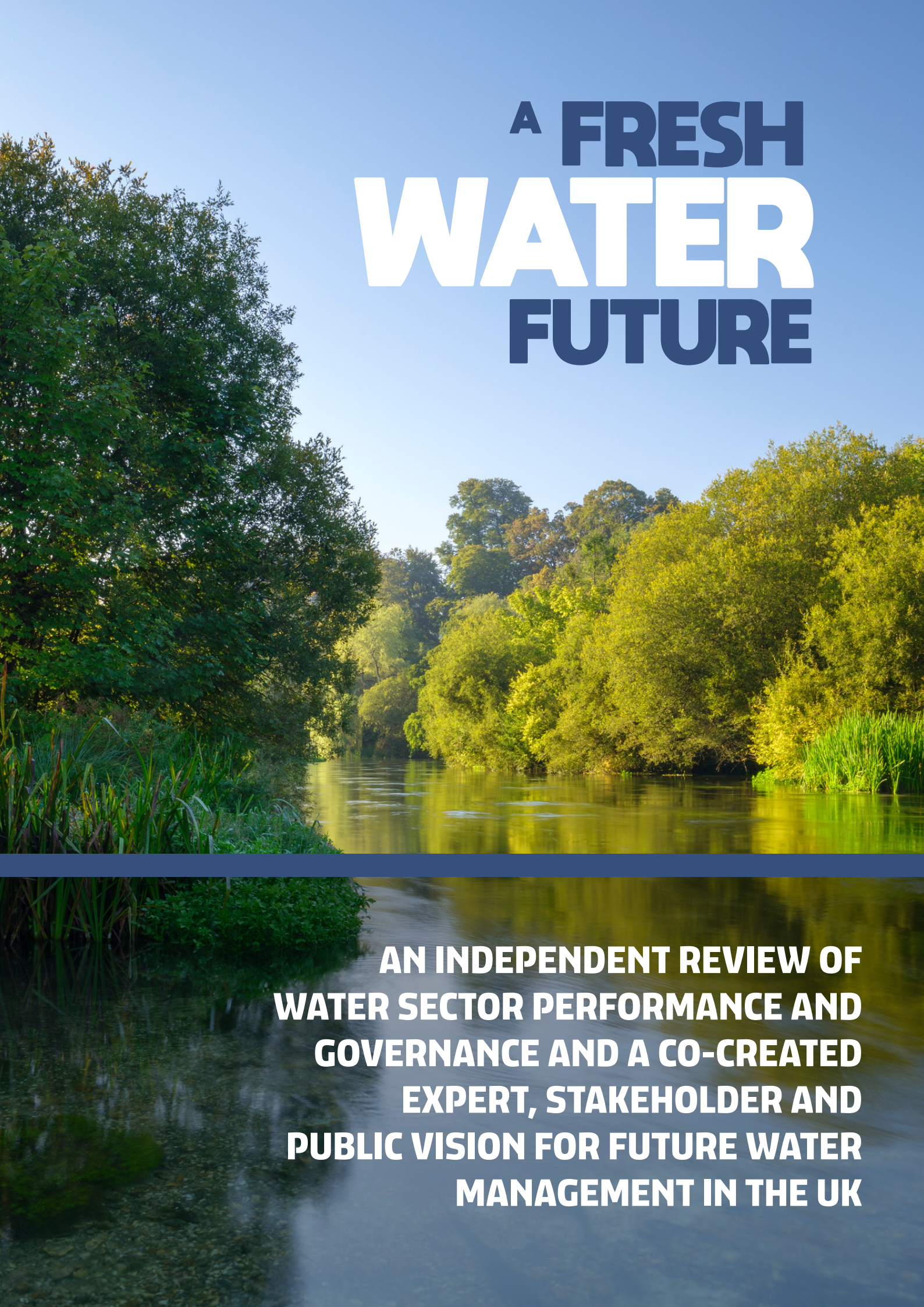

A FRESH WATER FUTURE

AN INDEPENDENT REVIEW OF WATER SECTOR PERFORMANCE AND GOVERNANCE AND A CO-CREATED EXPERT, STAKEHOLDER AND PUBLIC VISION FOR FUTURE WATER MANAGEMENT IN THE UK

CIWEM

A Fresh Water Future was facilitated by The Chartered Institution of Water and Environmental Management.
www.ciwem.org

Esmée Fairbairn FOUNDATION

This work was generously supported by the Esmee Fairbairn Foundation.
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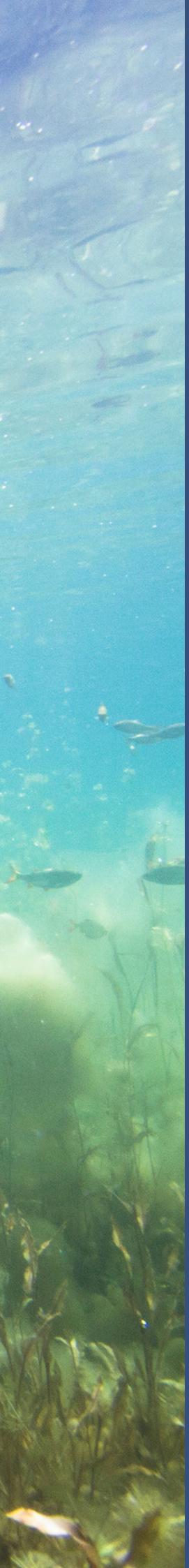

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OVERVIEW

OUR FRESHWATER SYSTEMS ARE UNDER GRAVE PRESSURE. THEY NEED AN URGENT, REFRESHED APPROACH TO THEIR MANAGEMENT.

The United Kingdom faces wide-ranging water challenges, impacting our ability to be resilient to climate change in the context of drought, flood, as well as heat. Various pollutants and practices are also degrading all forms of water body, from the headwaters of our river systems to the sea, leading to extensive poor ecological condition.

There is not a clear official picture of whether this condition is improving or declining, though it is widely considered previous improvements are now being lost. Monitoring is inadequate to provide a clear picture, which makes targeting investment to the most impactful solutions difficult.

Meanwhile, policy and regulation has failed to keep on top of a wide range of activities and impacts. Water company performance is of great concern to both the public and professionals, and governments have failed to ensure enough investment in maintaining and upgrading infrastructure. Sewage discharges cause bacteriological, nutrient, fungal, litter and chemical pollution beyond levels of public acceptability.

Water supply leakage rates are at a level that makes it difficult for water companies to ask people to use water more efficiently in their homes, though few people can recall being asked.

Abstraction of water for public water supply is above sustainable levels. There is a need to secure considerable new resources for public supplies, agriculture and energy, as well as to cope with climate change. We face the very real prospect of water supply interruptions in the near future.

Likewise, water management in the urban setting is fragmented, poorly resourced and failing to prevent pollution running off hard surfaces, arising from traffic as well as chemicals we use in our homes. It is also failing to unlock potential efficiencies through delivering multi-beneficial solutions to surface water problems by coordinating different funding pots. Flooding and drought are largely addressed in isolation; neither silo integrating with water quality or wider environmental impacts effectively.

In the rural setting intensive, high-input farming has resulted in nutrient overload of soils and waterbodies, soil degradation and erosion and the devastating decline of rivers like the Wye and lakes like Lough Neagh. Risks from pesticide and antibiotic use continue to grow.

Despite high ambition of the post-Brexit Environmental Land Management Schemes to deliver more nature- and water-friendly farming through 'public money for public goods', many farmers are unaware of the nutrient pollution they are causing, even if they are complying with the law. Good practice is still widely outstripped by bad. At the same time, climate change is increasing food security risks, meaning greater demand for water for food production.

"Over three quarters of the public polled believed water reform should be a priority, or the main priority for the next government."

Combined, these pressures place a grave load on the health of our freshwater systems and there is growing concern over the public health impacts of water pollution from a range of sources. Whilst pressures have increased, the capacity of agencies responsible for monitoring and enforcing performance and compliance has been slashed and there is widespread and growing anger that they have not been managed adequately in the past.

The public and water management professionals want to see strong leadership and action. Polling for A Fresh Water Future shows 81 per cent of people are concerned about the health of the environment. The majority believe it is getting worse and that water is central to this.

Three quarters of the public consider government must bear responsibility for action. Likewise, three quarters of water experts consider stronger government policy and regulation is critical to solving water challenges.

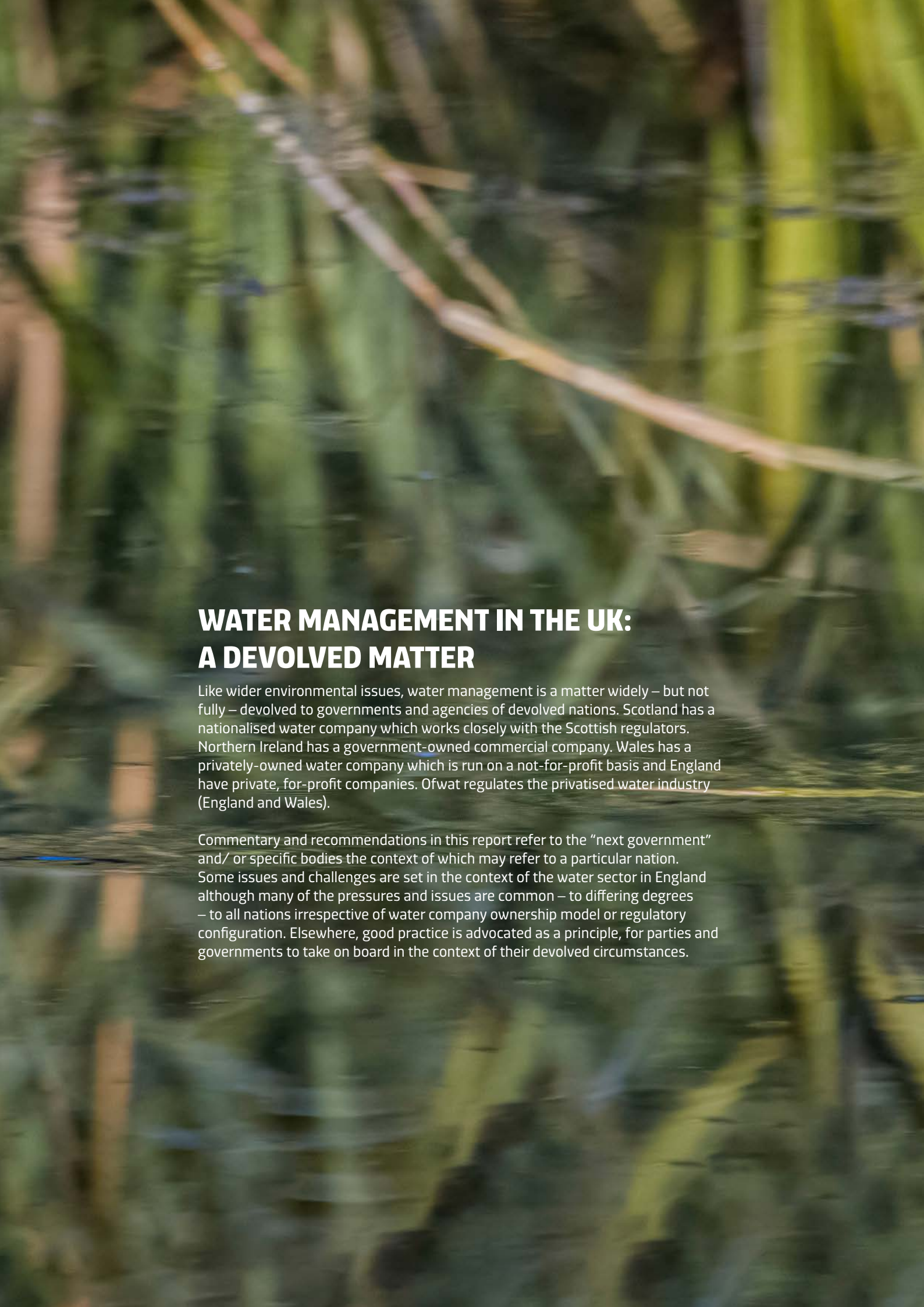
Through its Environmental Improvement Plan and Plan for Water, government has pledged to deliver clean and plentiful water by transforming and integrating (linking up) our water system, tackling pollutants at source and making polluters pay. It points to the absolutely essential role water plays in our social and economic health and wellbeing.

These are the right words, but they need far greater commitment to actually deliver transformation. Government claims to have made "huge progress on water". Stakeholders, practitioners and the public point instead to wide-ranging underinvestment, inadequate regulation and progressive decline in the health and resilience of our water environment. They are angry about this.

This must change. Water management and regulation needs urgent and ambitious focus, policy response and investment. Over three quarters of the public polled believed water reform should be a priority, or the main priority for the next government.

Without transformational change, the decline in the health and resilience of water for our economy, society and nature seen over recent decades will not just continue but accelerate in the face of growing pressures.

Transformation must mean just that. We need a fresh water future.



WATER MANAGEMENT IN THE UK: A DEVOLVED MATTER

Like wider environmental issues, water management is a matter widely – but not fully – devolved to governments and agencies of devolved nations. Scotland has a nationalised water company which works closely with the Scottish regulators. Northern Ireland has a government-owned commercial company. Wales has a privately-owned water company which is run on a not-for-profit basis and England have private, for-profit companies. Ofwat regulates the privatised water industry (England and Wales).

Commentary and recommendations in this report refer to the "next government" and/ or specific bodies the context of which may refer to a particular nation. Some issues and challenges are set in the context of the water sector in England although many of the pressures and issues are common – to differing degrees – to all nations irrespective of water company ownership model or regulatory configuration. Elsewhere, good practice is advocated as a principle, for parties and governments to take on board in the context of their devolved circumstances.

A FRESH WATER FUTURE IS POSSIBLE

Received wisdoms pits good water management against affordable development, food production and public freedom of choice. But experience and practice elsewhere in the world show this is wrong.

Water gets everywhere. It is essential to life and is interconnected so an action somewhere usually impacts somewhere – and someone – else. This is why there is growing emphasis on managing water as a system.

Yet we over-simplify or ignore this and still manage water in a very segregated way, targeting only part of the picture. So, we fail: Our water gets more polluted, scarce, likely to flood us, and more expensive.

Very simply, if we continue to work this way we will continue to fail. And a fundamental foundation of our social and economic wellbeing will continue to be eroded. Because of the linked, and compound nature of water challenges, the pace and extent of decline and impact will grow without decisive and urgent action.

There is a democratic deficit in water, with local community engagement in decision-making and investment power poorly linked to accountable, elected representatives. So, communities often do not widely appreciate the pressures on their local water environment or value their good management. Managing water better is harder in the short-term. It will need more commitment and capacity in those bodies who manage and regulate it so they can, actually, do so as a system. It will need change.

Water companies in England and Wales have proposed almost £100 billion to be spent in their next investment plans. Similar sums will need to be invested in subsequent delivery periods. Some of this is to make up for timely maintenance and investment that should have happened and been better regulated in the past. Some is because increasingly extreme weather means a growing number of assets are no longer fit for the purpose they were designed for.

Looking beyond water company spending to flood risk, agriculture and highway pollution, we will have to invest considerably more through other vehicles if we are to halt environmental decline and ensure resilience to drought, flood and crop failures.

Water management will cost a lot to manage, however we configure it because it has, and continues to be, priced below the cost of the impacts of abstractions and discharges on the environment. But we have seen transformational investment in water management in the past to great social benefit: Most people receive high-quality water supply and sanitation services in their homes.

We must see that scale of ambition again.

When spending such large amounts of money, the interests of the public and the environment should be paramount. Above all this means investing money well, so it unlocks the most value to society. It means being transparent about how and why it is being spent and being democratic and inclusive in understanding local context, pressures and priorities.

"We have seen transformational investment in water management in the past to great social benefit: Most people receive high-quality water supply and sanitation services in their homes.

We must see that scale of ambition again."

This needs good monitoring and understanding of the systems involved and outcomes targeted. Good governance systems, so investment is well-targeted and not wasted. Good policy which is mutually reinforcing not conflicting. Robust regulation and enforcement so those who over-exploit or pollute water know there is genuine consequence to doing so. And, strong leadership because water management needs a long-term approach against which water companies and others can plan and invest with confidence.

These are not far-off, yet-to-be-invented things. Typically, they take the form of improved governance measures that can and should be put in place by the next government (although technological innovation should be supported to also unlock greater performance and efficiency).

We need to build on plans and strategies which already exist to create a long-term, water-environment vision and mission. This must work, and there must be the governance frameworks underpinning it, to enable progressive, sustainable improvement in water health. It must address the perennial problem of progress being undermined by having to patch-up creaking infrastructure.

The way water management is currently delivered is inefficient. It is centralised yet siloed within segregated responsibilities and funding streams that lead to often expensive, single-outcome solutions.

Instead, a more adaptable, distributed approach to water governance and the interventions used is needed, which harnesses nature where possible and works with water not against it.

This approach must be founded on sufficient evidence and understanding of environmental as well as infrastructure condition and pressures, to identify the best set of interventions for any given challenge and context. This needs better use of existing data, as well as additional monitoring.

There is extensive knowledge and evidence of how to manage water well. Good practice exists both within these shores and overseas. It shows good water management needs care, leadership and ambition. But with the right social safeguards in place, it can be affordable and unlock considerably wider value to society than we do now.

These recommendations reflect a collective view across experts and informed stakeholders engaged in their hundreds through A Fresh Water Future. They also consider and reflect the findings of widespread public engagement, deliberation and polling.

They call for a wide range of individually deliverable changes over a wide-reaching water cycle. Changes that in combination can be transformative and unlock a fresh water future that enables sustainable growth, prosperity and wellbeing both for current and future generations.

A fresh water future is possible.

OUR FRESHWATER SYSTEMS ARE UNDER GRAVE PRESSURE. THEY NEED AN URGENT, REFRESHED APPROACH TO THEIR MANAGEMENT

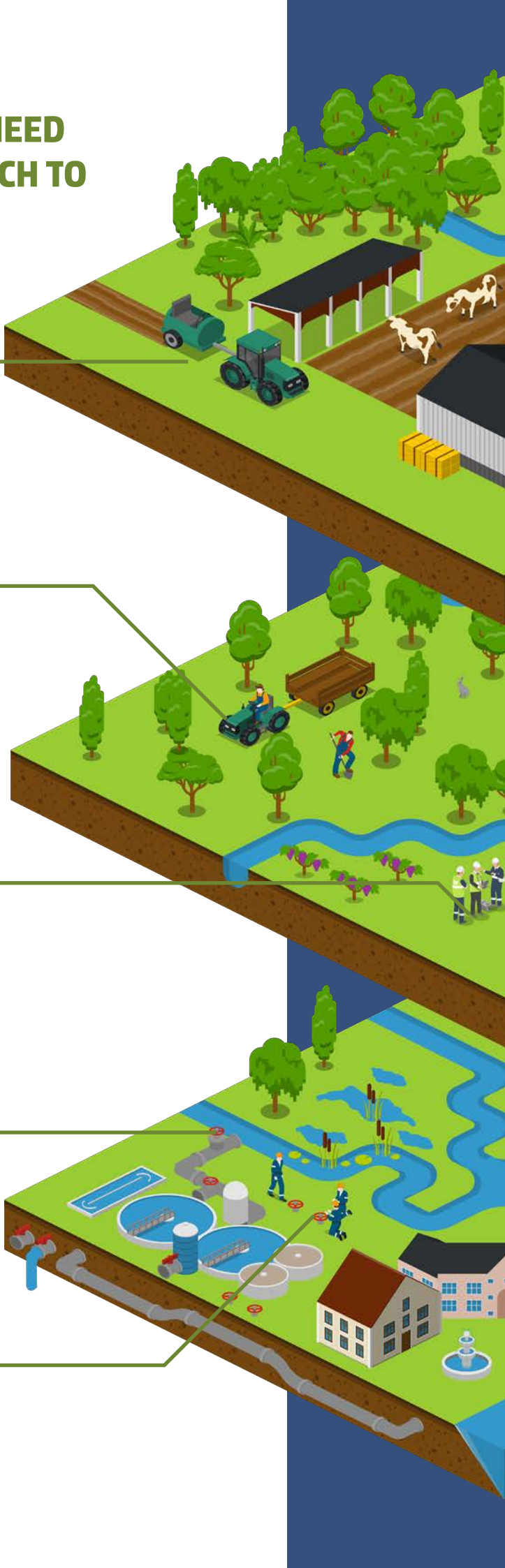
Deliver a statutory nutrient management programme **7**

Improve advice and support for nature- and water-friendly farming, mirrored by increased enforcement against poor practice, unlocking a fair balance between enforcement and support **6**

Increase the level of monitoring through a National Environmental Monitoring Strategy and Programme **4**

Governance and regulation of water companies: Purpose-led organisations compliant with the law **3**

Invest in maintaining water systems so infrastructure upgrades endure **8**



2 Review, and if necessary reform, regulators so that they can discharge their responsibilities effectively

9 Adopt a 'sponge cities' approach to our villages, towns and cities to unlock regeneration, resilience, prosperity and a fresh water future

5 Introduce ambitious Catchment System Management

1 The next government should commission a comprehensive, independent review of water management, to report within its first twelve months

10 Nurture society's value of water through greater awareness of usage

METHODOLOGY

The health of the water environment is an issue increasingly capturing media attention, concerning the public and getting traction with decision-makers. It has been a major concern for water management practitioners, stakeholders and campaign groups and this concern is growing in light of emerging data and information.

Considerable pressures extend across the activities of water companies, agriculture and land management, management of rainwater (surface water) in the urban environment, and beyond. These relate particularly to pollution and water resource pressures impacting the amount of water taken out of rivers and groundwater.

For this reason – and to assure the approach and findings of the work – a diverse project steering group was assembled spanning campaign NGOs, water management practitioners, farmers, local government and the water industry. This ensured balance across approach, findings and recommendations.

Our approach to this project was to extensively engage the public, alongside practitioners and stakeholders to explore how far consensus might be found on high-level policy priorities for better water management to unlock lasting improvement in freshwater health. This engagement took place between August and December 2023.

PUBLIC ENGAGEMENT

The public were engaged by Public First to understand their awareness, values and concerns on water and to test the popularity of proposed policy direction arising from the project findings.

Focus groups tested values and concerns with local communities. Immersive fieldwork engaged communities extensively in three different UK locations, enabling access to the views of those who would not normally engage with market research. A deliberative online community of a nationally representative sample of people progressively considered in detail their local water bodies' condition, management and priorities and aspirations as well as the national picture.

A nationally representative poll of 4010 UK adults tested views relating to interim findings of the research to establish their resonance and popularity. Further focus groups explored positions in greater detail.

PRACTITIONER AND STAKEHOLDER (EXPERT) ENGAGEMENT

Practitioners and stakeholders were engaged by CIWEM to understand values, concerns, direct experience and priorities for improvement. Additionally, to workshop proposals for policy and delivery improvement that would unlock lasting improvement in the health of the water environment.

Semi-structured interviews were conducted with a range of senior and experienced water sector practitioners. Their expertise spanned water industry, regulation and enforcement, urban water management and agriculture. Additionally, academics and citizen science organisations were engaged. Interviews were non-attributable, to enable openness and candidness. Where expressed, these positions have been corroborated and are presented generically.

A detailed survey was disseminated amongst practitioner and stakeholder communities, engaging a wide range of national and local government, regulators, water industry, consultants, contractors, NGOs and campaign groups, academics and citizen scientists.

This explored in detail considerations of the health of UK fresh waters and related management and policy priorities. These spanned three focus areas: Water industry, agriculture and land management, and urban water management. A detailed literature review and policy analysis was also undertaken in parallel.

Interim findings from this data were converted into fifteen 'challenge statements' against which practitioners workshopped proposed policy and delivery solutions. Three workshops were convened online, considering five challenges each, relating to the water industry, agriculture/ land and catchment management, and urban water management.

The recommendations in this report draw on the data, evidence and positions expressed through this public-expert co-creation process. Some will require detailed consideration and/ or primary legislation. But, there is extensive scope for rapid progress with the necessary ambition.

HEADLINE FINDINGS

THE PUBLIC'S POSITION

THE PUBLIC VALUE THEIR LOCAL WATER BODIES.

84%

of people believed water pollution to be an issue in the UK

People told us they use and value their local water bodies extensively in both urban and rural contexts, as a community integrator.

Most said they engaged with local waters weekly for recreation or reflection. In polling, 84 per cent of people believed water pollution to be an issue in the UK. A majority considered the health of the environment has declined over the past ten years.

This underlines the importance of water to people and communities beyond merely supply and sanitation in their homes.

THE MAJORITY OF PEOPLE DO NOT KNOW THE HEALTH OF THEIR LOCAL WATERS.

74%

of people were concerned about pollution affecting their local waters

Most members of the public engaged did not have a clear picture of whether their local water body was in good or bad condition.

Those who worked or engaged closely with water (businesses or recreational users) had a clearer position and a more negative perception. Nevertheless, 74 per cent of people were concerned about pollution affecting their local waters.

This shows that whilst people may not know the condition of water bodies near them, they are concerned and want them to be healthy. There is a clear need for organisations – infrastructure operators, businesses, regulators and more – to provide water stewardship services on the public's behalf.

Three-quarters of people believe the government must show leadership on tackling pollution and nature decline, with local authorities and regulators playing a key role.

PERCEPTIONS ON LOCAL WATER HEALTH DIFFER FROM THOSE ON NATIONAL PRESSURES.

30%

Only 30 per cent of those polled had any notion of the impact of agriculture on water pollution

Locally, people perceived a range of pressures on water including litter, agriculture, industry and sewage. Looking at the national picture, sewage pollution dominated perceptions.

Overwhelmingly, very few people appreciated the contribution of agriculture to water pollution, despite it having the greatest impact statistically. Only 30 per cent of those polled had any notion of this impact; a signal that was even stronger in focus groups.

This shows that the media and campaigners are effective in informing public opinion, and that the public are interested in the national picture as well as what is going on in their immediate environment. But this coverage is not delivering a complete picture on sources of impact. A narrow majority are also open to paying more for an improved environment, including through food prices for improved agricultural practice.

WHILST PEOPLE WANT TO SEE IMPROVEMENTS IN ENVIRONMENTAL PERFORMANCE THEY ARE CONCERNED ABOUT AFFORDABILITY.

40%

of people thought they would struggle to pay bills that were 25 per cent higher

A quarter of people considered they would struggle to cover a ten per cent increase in their bills, were they to rise over coming years.

40 per cent of people thought they would struggle to pay bills that were 25 per cent higher. Almost half said they would be unlikely to be able to cover a 50 per cent increase. People most widely expected bills to increase by 10-20 per cent whilst only five per cent thought their bills might rise by 50 per cent.

This illustrates the current challenge in water management and the affordability and value for money risks in taking an approach which prioritises large amounts of investment without it being targeted at the most impactful solutions.

The public clearly want to see improvement, but they are worried about bill impacts and are unsighted on the scale of potential increase set out in draft water company business plans.

Maximising impact, outcomes, and cost-effectiveness of the necessary investment on water will be critical for the next government.

PEOPLE ARE BROADLY SATISFIED WITH WATER SERVICES PROVIDED IN THEIR HOME, BUT THERE IS A MIXED PICTURE REGARDING WATER SERVICES BEING DELIVERED ON A FOR-PROFIT BASIS.

People widely cited a reliable service provided by their local water company. But they equated sewage pollution with an imbalance between water company investment and profits, playing out in the water environment.

Two-thirds of people told us they understand their water bill and what they pay for. And whilst water is widely considered affordable (second only to broadband in comparison with other utilities) there was a mixed picture on value for money. In polling, less than half (48 per cent) considered their bills to be proportionate to the service delivered. In focus groups comparisons were widely drawn against other utilities and people felt that water was cheap considering the utility derived from it.

Extensively in focus groups and immersive research people expressed unease at profit influencing prioritisation in water management and were mistrustful of how any more money they may be asked to pay for improvements through bills may be used. They wanted to see stronger government assurance against this.

In polling, 71 per cent of people from England considered water company profits should be restricted because of performance concerns. Two-thirds considered that companies make too much profit, but few believed they should not be allowed to make any returns.

This shows that values and principles around trustworthiness are strong when it comes to the provision of an essential public good like water and a healthy water environment. The public broadly have confidence in water services provided in their homes but outside of this context this falls considerably.

People feel they should have confidence that responsible organisations are acting in their interests – which includes the water environment – not in those of others for motives of profit. They do not have that confidence now.

PRACTITIONER AND STAKEHOLDER FINDINGS

THERE IS A STRONG POSITION AMONGST PRACTITIONERS THAT WATER MANAGEMENT IS NOT DELIVERING THE LEVEL OF OUTCOMES SOCIETY NEEDS, AND THIS MUST BE IMPROVED.

This performance failure is rooted in various factors but extends across the water industry, farming and land management and urban water management.

Extensively, practitioners consider the way money is being spent on water management is neither effective nor efficient.

Practitioners did not consider that the entire water management system is broken. However, because values, expectations and pressures, as well as the regulatory and management framework have evolved over time, it needs a detailed and thorough review and programme of improvement to ensure it is fit for coming decades.

At the same time, they consider the next government must expedite some fundamental, enabling measures.

This shows that there has been inadequate policy prioritisation of water management for some considerable time. This has occurred alongside inexorable increase in the pressures on the water environment. Increased water demand, climate change and a growing range of pollutants emitted to the environment through ever-widening pathways have been allowed to take a significant toll.

PRACTITIONERS AND STAKEHOLDERS ARE EXTENSIVELY UNHAPPY WITH THE OPERATION OF WATER COMPANIES.

Experts spoke with pride at the UK's record of providing safe and secure supplies of drinking water and reliable sewerage to householders. However, they – alongside a strong majority of survey respondents – expressed a profound preference for something other than the currently-configured ownership model for the water industry in England.

Less than six per cent of respondents favoured the current English ownership and governance model. Preference for an alternative was mixed, mainly across not-for-profit, nationalised or for-profit with stronger public purpose governance.

Practitioners cite a strong public service motivation in working within the sector but widely feel this has been tainted by association with certain egregious examples of malpractice and profiteering. A lack of transparency on factors from corporate structures and money-flows to decision-making and environmental performance further add to this unease.

This indicates a strong desire to see significantly greater assurance and confidence that, despite a considerable increase in infrastructure investment following privatisation, water and sewerage companies in England operate primarily in the public interest, rather than that of their shareholders. Additionally, that large amounts of money invested by the industry must be spent efficiently and unlock the maximum range of benefit to society.

Whilst there is low confidence that the current configuration of water companies in England will deliver optimal cost effectiveness from a large amount of investment there is also extensive concern over the ability of a renationalised industry to compete with other central spending pressures. Likewise, over the ability to transition smoothly to a model such as not-for-profit.

A combination of stronger regulation, greater transparency and purpose-led companies may represent an appropriate balance between improved practice and assurance, and an investable for-profit industry. But this will need companies to demonstrate convincingly that they are willing to change.

There is widespread recognition of concerns relating to investor confidence for water companies in a tougher regulatory environment. However, if the next government decides the necessary investment must come from private finance there will need to be investor confidence in the medium- to long-term credibility of water companies.

Practitioners consider the risks of not acting to improve water company compliance and credibility in response to current challenges, because of investability fears, are likely to be greater than those inherent in acting.

PRACTITIONERS CONSIDER THAT REGULATION OF WATER MANAGEMENT NEEDS THOROUGH REVIEW.

There was widespread concern that environmental and economic regulators have not kept on top of increasing pressures from regulated activities as well as wider pressures like climate change.

A wide range of factors were cited but there was extensive concern at the long-term impacts of political interference and budget cuts feeding into capacity, culture and competence challenges.

The legislative and regulatory framework was considered to be a combination of adequate but inadequately monitored and enforced; outdated and in need of update; weakened or at risk of this due to political priorities, or poorly developed because of knee-jerk responses to single-issue media and campaigner pressure.

A distinction was drawn between the ability of the Drinking Water Inspectorate to effectively regulate (including through operator self-monitoring) drinking water quality, and the challenges faced by far larger environmental regulators to ensure such compliance in relation to wastewater discharges. The difference in consequence for regulated organisations of non-compliance between the two was widely drawn, along with a consideration that this translates through into very different levels of corporate risk appetite.

Elsewhere, the diffuse nature of many pollutants – from agricultural to urban – meant many considered monitoring and regulating them effectively needed both improved catchment monitoring and data interrogation capacity to target sources and drive improvement effectively.

This indicates that those working across water management experience first-hand that regulation is not working to protect society and the environment for a variety of reasons which must be addressed.

It is not seen to compel the right behaviours or drive efficient and effective use of money, at a time when it is increasingly needed to manage extensive system pressures.

WIDELY, PRACTITIONERS SEE THAT THERE IS CONSIDERABLE SCOPE FOR AGRICULTURE AND OTHER LAND MANAGEMENT TO DELIVER FAR GREATER OUTCOMES FOR WATER.

Agricultural support mechanisms such as the Environmental Land Management Schemes (ELMS) should incentivise this more concertedly and water companies should work far more widely with farmers to unlock water resource and quality outcomes.

There are good examples of how agricultural subsidy schemes have driven water management improvements. However, these are typically delivered by a minority, whereas improved practice should realistically become the norm. Widely, ELMS is seen to be weak on incentivising water outcomes.

Likewise, there are good examples of water companies working in partnership with farmers to unlock improvements, but these activities usually exist at the periphery of core programmes. A lack of combined political, regulatory and corporate will to accept higher levels of uncertainty associated with such approaches works against unlocking their transformative potential.

This shows there is strong practitioner support for working at a landscape scale with farmers or groups of farmers to work with nature to unlock benefits to society. But current mechanisms – from ELMS to the national framework for water resources – do not drive this. Given development policy ambitions juxtaposed against water resource and pollution pressures, this is nonsensical and needs urgent attention.

THERE IS A STRONG POSITION THAT WATER PLANNING, FUNDING, COORDINATION AND GOVERNANCE SHOULD HAVE STRONGER DEMOCRATIC, COMMUNITY AND SPATIAL CONTEXT.

Water transcends political administrative boundaries and pressures manifest at regional, sub-regional and catchment scale. Across the different water management areas of focus, practitioners widely expressed the view that this reality must be reflected in an improved, spatially relevant approach to water management.

This should involve all relevant actors in the system in a way that empowers them to be engaged and to act. It should also enable different funding sources to be pooled and coordinated to target the widest range of outcomes and the greatest efficiency.

Enhanced catchment system management, aligned to a consistent national framework, drawing and building on existing plans and frameworks but flexible to regional or local context (from rural to metropolitan) was widely advocated.

This was considered to be potentially transformative change that would need bold vision and leadership, but which was necessary to manage the distributed range of pressures on water (and necessary solutions).

This indicates a growing consensus that a more spatially relevant, democratic and collaborative land and water management approach is needed to unlock improvement in water health.

The benefits of multi-stakeholder, collaborative approaches have been shown through the Catchment Based Approach. However, this is woefully underfunded and lacking authority to be able to address the scale of water challenges we face. There is a clear desire for the next government to explore the detail of the approach and implement it at scale.

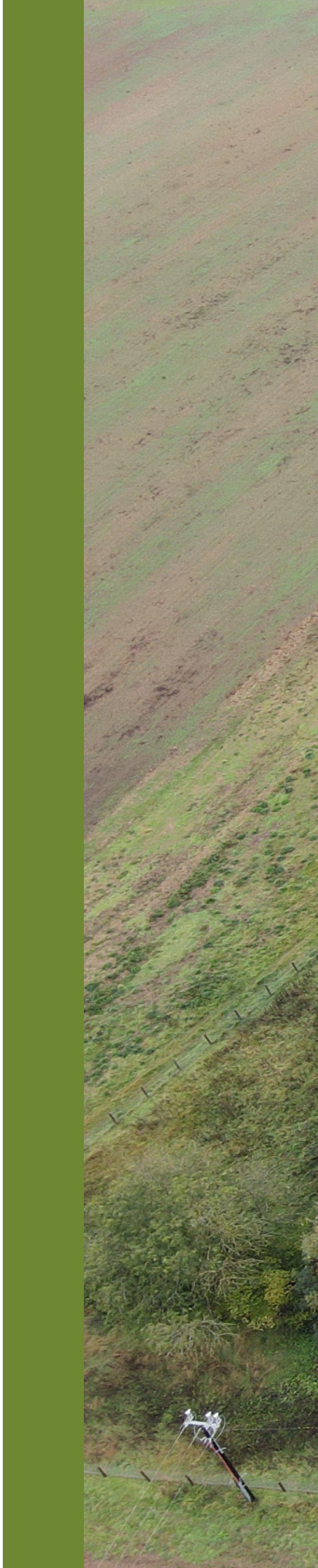


Photo credit: Spains Hall Estate

RECOMMENDATIONS

1 COMMISSION A COMPREHENSIVE, INDEPENDENT REVIEW OF WATER MANAGEMENT, TO REPORT WITHIN ITS FIRST TWELVE MONTHS

There are widespread system and governance issues at the root of the current water pollution and resilience challenge that need detailed review beyond the capacity of this project. These extend beyond the Defra-led aspects of water management and across wider government. Therefore, Cabinet Office should commission an independently chaired review of how water is currently managed and regulated. Commenced immediately post-election, it should report inside the first 12 months of the next government's term. This will enable recommendations to be implemented across the remainder of the term.

Water requires a system-focused approach to its management because it is so integrated into different facets of the economy, society and environment. Its regulatory framework is based around decades-old pressures and drivers and has evolved organically over time into a complex and at times conflicting set of drivers, checks and balances.

Pressures on the water environment have changed and grown significantly during this time. The configuration and prioritisation of this framework, the organisations who deliver against it and their capacity to do so needs thorough review to ensure it is fit for purpose.

This review needs to look across the full range of pressures, needs and enablers associated with water. To effectively inform a programme of improvement which can unlock sustainable growth and productivity alongside nature recovery, this should be prioritised early in the next government's term in office.

It should look to build on considerations embedded into the Water Framework Directive and its daughter Directives and develop an overarching vision for water that balances environmental, recreational and wider water needs.

It should consider fundamental questions including the necessary water standards required for ecological recovery and ongoing health, recreational use needs and standards, and whether there is any appropriate use of rivers and coastal waters for sewage disposal. If so, it should clearly set the conditions for such.

Given the scale of investment needed in water, this should examine whether legal and economic regulatory frameworks currently drive the widest and most cost-effective range of outcomes for society and the environment. Where they do not, a programme of legislative and regulatory change should be set out.

Because of the wide range of interests involved with water, this review should be commissioned and overseen by the Cabinet Office rather than Defra.

We acknowledge that an independent review of water will come to its own findings and recommendations. However, this work has identified the following actions as priorities for water managers and stakeholders to improve water management. These are supported, or speak to concerns expressed by the public.

We urge the next government to make these changes urgently, bringing about a confident transition to a bolder approach to water management against which investment and finance can be mobilised. Many recommendations build on an emerging direction of travel which needs an injection of pace.

With a necessary step-change in ambition and delivery, there are many 'quick wins' available that can begin to unlock extensive natural and social capital value to the nation.

"With a necessary step-change in ambition and delivery, there are many 'quick wins' available that can begin to unlock extensive natural and social capital value to the nation."

2 REVIEW, AND IF NECESSARY REFORM, REGULATORS SO THAT THEY CAN DISCHARGE THEIR RESPONSIBILITIES EFFECTIVELY

Environmental and economic regulators of water management have struggled to keep on top of the performance of the industries which they regulate. They should be independently reviewed through the overarching review of water management to ensure that their scope, resource and capacity are appropriate to the range of activities they are required to regulate and/ or deliver.

Robust regulation is essential to protecting the environment. This involves properly monitoring performance and enforcing legislation and regulation.

Practitioners extensively expressed concern that the ability of environmental regulators to do this has decreased as budgets have been cut, despite pressures on the environment increasing.

This is seen as driven by a lack of political will to ensure strong regulation is in place and appropriately enforced. Moreover, given this increase in pressures, stakeholders consider more sectors (e.g. intensive livestock production) should be brought into the environmental permitting regime.

There must be a clear increase in regulatory capacity to drive an expectation amongst all regulated activities that environmental performance will be monitored through a robust process and infringements enforced.

This process needs to be visible to all potential polluters to embed a mindset that contraventions will be penalised. Strong, re-empowered regulators will be central to this. The performance of regulators should be regularly monitored by the Office for Environmental Protection alongside the Office of National Statistics and presented to Parliament.

Operator self-monitoring (OSM) of wastewater discharges was extensively flagged in our research as a driver of asset sweating and widespread non-compliance. It has the potential to enhance data but is only robust when paired with sufficient jeopardy for the company. It should be paired with on-the-spot, unannounced inspections by upskilled environmental regulators, at frequencies at least as regular as before OSM was introduced.

This will need increased capacity for regulators both in terms of competency and skills, monitoring capacity, digital infrastructure and enforcement grant-in-aid funding. This needs to go further than the recent increase in trained regulatory officers within the Environment Agency.

Pay for employees of environmental regulators was identified as a challenge. This should be benchmarked and aligned with other water sector pay so they can compete in the marketplace for the most skilled and competent employees.

Penalties and fines should be reinvested in water restoration programmes that regulated industries themselves cannot lead, and permit costs should reflect the true cost of regulation.

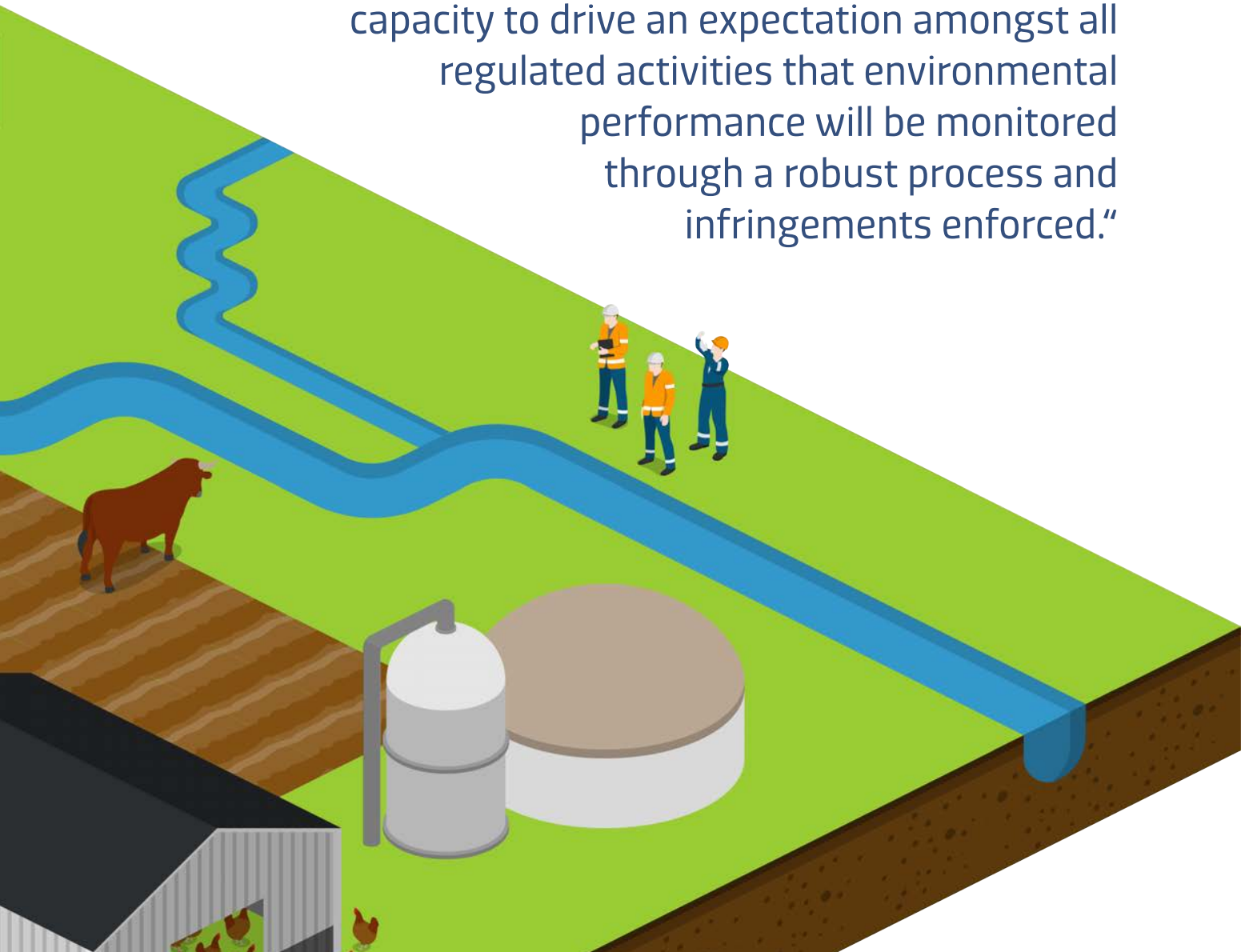
Beyond this issue of capacity, practitioners also widely questioned whether the configuration and priorities of environmental and economic regulators are driving the most efficient and widely beneficial outcomes, and whether the processes underpinning this are optimised.

A widely given example of this was the water industry national environment programme (WINEP). Despite its environmental focus and the emphasis on nature-based solutions in its guidance, risk-aversion has widely resulted in single-outcome, hard-engineered solutions within WINEP programmes rather than multi-functional, nature-based ones. This imbalance must be reconfigured.

There is additional concern that by the time the next government takes office the next water company investment programme for England and Wales will have been finalised, locking in a direction of travel and suite of solutions until 2030.

Given the wider recommendations in this report and a rapidly-progressing climate crisis, the scope to review and optimise water company business plans in the light of wider changes the new government might quickly implement should be considered.

"There must be a clear increase in regulatory capacity to drive an expectation amongst all regulated activities that environmental performance will be monitored through a robust process and infringements enforced."



3 REFORM GOVERNANCE AND REGULATION OF WATER COMPANIES TO CREATE PURPOSE-LED ORGANISATIONS, TRANSPARENT AND COMPLIANT WITH THE LAW

A Defra-led 'water assurance taskforce' should be established to fully review and drive forward reform of water company performance alongside that of their regulators. This should have the remit to establish baseline corporate governance standards, compliance with environmental regulation and, once achieved, move towards a more outcomes-based approach to regulation.

Water companies have a damaged social licence to operate and need to rebuild confidence that they are operating in the public and the environment's interest. This will hinge on two factors: Compliance with the law and regulations and a clear, verifiable demonstration that they are being transparent and operating in a socially acceptable way, for the benefit of their customers, communities and the environment.

Delivering against these will afford companies considerably more license to ask their customers to support them in delivering improved performance through greater water-efficiency and reduced sewer abuse.

Increases in bills – a harsh reality of the need for considerable investment in upgraded infrastructure – may then be more widely accepted. And better-performing companies with a demonstrably strong corporate culture should then increasingly be able to position themselves as an attractive, long-term green investment.

Ofwat must be directed and allowed to use its new duties on dividends and executive pay – relating to financial sustainability and environmental performance – concertedly. There should be no doubt for water companies that they must comply with the law and sanctions should target owners and investors where performance is poor.

Likewise, the Environment Agency's ability to levy larger penalties for serious breaches of permits and pollution incidents should be used as a powerful deterrent to non-compliance, driving rapid improvement and reducing the need for lengthy legal proceedings.

Alongside this, all water companies should be required under their licence conditions to reconstitute as purpose-driven organisations before the commencement of the next round of water company business planning (PR29).

Ofwat should work with companies to build bespoke purpose statements reflecting specific geographic, economic and demographic characteristics of their regions. However, there should be a foundation of common principles including a fair price for water, resilience, service reliability, customer and employee engagement and involvement in strategic decision-making, sustainability and environmental performance, and corporate structure and transparency.

Companies should be required to report annually on how this is driving change and outcomes in the company. The purpose-led approach should be independently audited and considered annually as part of Ofwat's annual performance assessment.

In parallel with water companies being required to be public purpose-led, Ofwat must also be given a clear duty to regulate against the same purpose principles.

Companies should be required to implement an 'open book' approach and report transparently on their performance (particularly discharges and abstractions and how these relate to permitted levels, as well as their carbon emissions); on their investment programmes (covering asset condition, what they are spending money on and where); on their corporate structures, and on executive pay and dividends.

This reporting should be delivered in a way which their customers can readily interpret and understand, and companies should proactively communicate this information with them.

The suite of outcome delivery incentives (ODIs) for water companies should also be reviewed to ensure that they are balancing risk and reward, driving the most desirable outcomes effectively (e.g., from transparency through to nature-based solutions use) not the wrong behaviours.

Affordability of the necessary investment in water is a widespread concern. One in four people struggle with their water bill and the range of water bill increases proposed by companies between 2025-30 is up to 66 per cent, before inflation. Yet our research indicates few people are expecting appreciable water bill increases in coming years.

Support for people struggling to afford their bills is provided by water companies and proposed to increase in the next 5-year investment round. Yet the approach is not nationally consistent and there is strong practitioner support for a consistent approach to social tariffs. Consistent and comprehensive support is sorely needed to help the affordability of investment as the water infrastructure challenge grows.

If the cost to water companies of performance improvement and compliance results in their failure, then the findings of the independent review should inform how they might be constituted (in terms of structure and financing) in future.

If appropriate, spatial reconfiguration of failed companies to establish a far stronger municipal link with combined or other mayoral authorities would establish a foundation for a more integrated and democratic approach to managing water, between local authority and water company functions (planning, growth, flood risk management, etc.).

This overall approach would enable well-run, high-performing privatised companies to continue to operate within a more purpose-led framework. But where poorly performing companies fail there would be a route to a more widely desired model.

> "Companies should be required to implement an 'open book' approach and report transparently on their performance"

4 INCREASE THE LEVEL OF MONITORING THROUGH A NATIONAL ENVIRONMENTAL MONITORING STRATEGY AND PROGRAMME

Develop and implement a national environmental monitoring strategy to provide a clear picture of pressures on the environment that enables targeted, cost-effective solutions delivery and clarifies accountability. This should define the target outcomes for enhanced monitoring and data analysis, the parameters to be monitored to achieve these, and the necessary approach to establish this clear picture.

This enhanced approach to monitoring – overseen by environmental regulators – should unlock the potential of trained citizen science and set out a framework for open data transparency on all appropriate aspects of water company operations.

It should define priority areas of need for monitoring and ensure that the data generated is of high value. It should take forward an approach where all sources of available catchment data are combined to create the best possible picture of environmental condition.

It should make use of a range of monitoring approaches, from sensors on outfalls to remote sensing for bare areas of soil on farms, in-stream monitors, and volunteer sampling to capture the overall health of watercourses. This should then be refined by intelligently homing in on problem areas. The programme should make use of data management specialists and build this skills base to ensure that often vast amounts of existing data is being harnessed effectively.

Catchment system monitoring involving multiple data sources would better-inform the Water Framework Directive picture and that of the overall health of water bodies, particularly headwaters and tributaries of river systems. It would also help to track and improve understanding of contaminants such as microplastics and so-called forever chemicals.

Catchment system monitoring should form the foundation for a catchment system management approach and an integrated suite of coherent plans which work at this level. This would enable a far more informed evidence-base for decision-making, prioritisation and investment programmes targeted at the best outcomes for the whole catchment, rather than focusing extensive (and expensive) programmes on single problems.

The UK should aim to become a leader in monitoring and modelling technologies, developing the use of AI, machine learning, data interrogation and digital twin technology. This would better-understand infrastructure asset health and performance, as well as river systems proactively.

Large language models and generative AI can enable the use of free text information to further add to beneficial data sets. A UK centre of excellence should be established with research and technology institutions to develop and export expertise and innovative products to the rest of the world.

Water industry monitoring should be funded through regulated investment approaches whilst wider catchment monitoring should be supported through Defra and supplemented as appropriate by penalties.

"The UK should aim to become a leader in monitoring and modelling technologies, developing the use of AI, machine learning, data interrogation and digital twin technology."

5 INTRODUCE AMBITIOUS CATCHMENT SYSTEM MANAGEMENT

Building on data flowing from a national environmental monitoring programme, implement a catchment / regional system management approach to investment and delivery of water-environmental outcomes.

There is both a systems thinking and a democratic, community engagement deficit in water management. Challenges and needs vary with local and regional economic, landscape and climate context. This should strategically inform how water management decisions and investment are prioritised and delivered.

The next government should implement a catchment system management approach which brings together the most appropriate authorities and regulators, businesses, landowners and other stakeholders across food, farming, energy, nature, health, infrastructure, finance, local and national government and more.

This should deliver a blended catchment finance approach to multi-functional water management delivery, building on collaborative experience at different scales (from the Catchment-Based Approach (CaBA) to strategic approaches in Manchester and London) to proactively align funding, finance, and delivery.

From the outset this approach should look at how funding directed at natural flood management, catchment delivery (CaBA), and through WINEP (all of which are overseen in England by the Environment Agency) could be combined in a more targeted way towards multi-benefit outcomes.

This suite of funding and investment streams should then be expanded over time to bring in wider water-focused funding, e.g. relating to flood risk management and environmental land management (agriculture). It should build on, and go beyond, the proposals set out in the Plan for Water.

Overseen by multi-stakeholder management boards and independently chaired, they should develop overarching, coherent and investible plans for local and regional water management priorities at an appropriate spatial scale. These should draw from existing plans and frameworks (governing land-use, flood risk, water resources, water quality, as well as local nature recovery strategies). The approach should also be used as a platform to encourage and enable partners from other sectors to develop their own strategic planning for managing their own water impacts.

The system manager's overarching plans should – based on enhanced catchment system data and models – identify efficient, targeted and risk-based investment priorities for water solutions that achieve value for money and benefit local and regional communities.

They should be able to recognise and reconcile trade-offs between different interests and identify the best-placed organisations in the catchment to deliver a prioritised suite of measures to progress water bodies into a defined target condition. They should actively facilitate groups of appropriate organisations and/ or land owners to deliver outcomes at a larger scale, increasing their impact and more effectively linking them with funding and investment streams.

In this way, system managers and their plans should act as a strategic enabler of sustainable housing and infrastructure development, food production and other national policy priorities.

Lessons in developing this approach may be taken from existing collaborative approaches. Examples proposed include Regional Flood and Coastal Committees or the Water Resources East governance model. There is growing experience of such working in regions including London, Manchester, Oxford-Cambridge and Norfolk. In such areas extensive partnerships have been developed to deliver more collaborative, informed, efficient and multi-beneficial approaches to delivery across catchments and administrative boundaries.

Common themes should be built into a nationally consistent framework for an outcomes-driven approach within catchment plans but allowing for flexibility in scale according to local context. This approach should be underpinned by a review of appropriate system actors' legal duties to cooperate, to ensure that these are reciprocal and appropriate to enable genuinely multi-partite collaboration.

Existing catchment partnerships, established under CaBA, should then be nested around these more administrative system managers as key catchment planning stakeholders and practical delivery arms with reduced fundraising and administrative burdens, and more delivery and engagement responsibility.

"The system manager's overarching plans should – based on enhanced catchment system data and models – identify efficient, targeted and risk-based investment priorities for water solutions that achieve value for money and benefit local and regional communities."

6 IMPROVE ADVICE AND SUPPORT FOR NATURE- AND WATER-FRIENDLY FARMING, MIRRORED BY INCREASED ENFORCEMENT AGAINST POOR PRACTICE TO UNLOCK A FAIR BALANCE BETWEEN ENFORCEMENT AND SUPPORT

Develop the Environmental Land Management Schemes (ELMS) so that they drive forward nature-friendly farming approaches which deliver beneficial outcomes for water alongside other public goods. Support this through catchment-monitoring and system management to target priority interventions, alongside a more robust 'advise then enforce' approach to farmer engagement.

Water is at the heart of many serious challenges for farmers, including soil erosion and crop damage through flood or drought. Equally, farming has considerable impact on the health of the water environment through irrigation, and rain washing slurries, manures, sediment and crop protection products into watercourses. Despite this, ELMS is largely silent on water.

Farm payments must therefore be linked to good water management, with water quality and resilience a major focus for farm advice. There must be a strong focus on water within standards set out under ELMS to enable farming to move to a model of efficient input, sustainable productivity, greater climate resilience and low environmental impact.

The next government should consider whether a dedicated ELMS water standard would drive better progress on water resilience than nesting limited water actions within other standards.

Farm advice and knowledge sharing should be rolled out widely through local peer-to-peer learning groups and tailored, impartial advice. These services must move away from product suppliers who incentivise farmers to stay locked into an input-heavy approach, and towards an independent advice service.

Advice should engage farmers on the local issues impacting catchments, how they can be tackled and how support can be obtained to implement solutions. This should include better understanding of the farm benefits and incentives for low-input agricultural techniques and those which deliver improved soil, farm and landscape water storage capacity.

This service should be set alongside a 2-year ratcheting-up of sanctions and enforcement against farmers who have been identified and engaged with previously on areas of performance improvement need. It should mimic the farm health and safety approach to delivery.

This engages the engaged through a peer-to-peer approach of sharing good practice through local examples; the less-engaged through on-farm visits and the disengaged through a regulatory approach. The approach must carry serious penalties for the worst, or serial offenders to embed a meaningful 'polluter pays' approach into agriculture.

'Advise then enforce' should ultimately lead to compliance with all water regulations. Advice and support must be rolled out swiftly and comprehensively.

Regulators must have sufficient resources to conduct a targeted and risk-based – but sufficiently frequent to be effective – programme of inspections. However, recognising the economic pressures faced by many particularly small farmers it should be supported by enhanced financial support for those keen to reduce their environmental impact and move towards nature-friendly, more climate resilient farming.

This support-respect relationship should be built out through a catchment system management approach, which establishes farmers and land managers as partners in the process. This should better-enable partnerships between key catchment system actors such as water companies, local authorities, developers, or major businesses who could pay farmers to deliver more strategic water outcomes.

Through enhanced catchment system monitoring, an increasingly granular picture of pressures, opportunities and the effectiveness of measures would enable an ongoing refinement of the payments and approaches incentivising outcomes delivery (for example standardised approaches to monitoring, reporting and verification). Over time, an effective approach increasingly attractive to private sector investment should be developed.

Improved land management has considerable scope to deliver extensive water outcomes if improved practice is achieved at a landscape-scale. A Land Use Framework should strategically identify where there are water pressures and opportunities that could be managed through more targeted measures and incentives within ELMS.

Additionally, a greater focus on agricultural water need should be embedded within the National Framework for Water Resources. This would enable coordinated planning and support for more effective, sustainable water use to underpin food security and water resilience.

The remit of internal drainage boards should be extended to enable all aspects of water level management. This should include agricultural water resources by enabling improved local farm storage and local resource-sharing.

"Regulators must have sufficient resources to conduct a targeted and risk-based – but sufficiently frequent to be effective – programme of inspections"

7 DELIVER A STATUTORY NUTRIENT MANAGEMENT PROGRAMME

Nutrient enrichment represents a major threat to freshwaters whilst appropriate use of nutrients by crop and livestock production remains an important component of maintaining production levels. A statutory nutrient management programme should embed soil testing, good practice through nutrient management plans and drive the use of more resource-efficient, low-input approaches to farming.

Mandatory soil testing should be required ahead of nutrient applications, so farmers and land managers understand crop need.

This should be implemented in line with a statutory nutrient management planning approach and catchment nutrient budgets embedded within catchment system management plans. Via an amended Farming Rules for Water, it would establish an enforceable link between nutrient testing results and nutrient loading in soils, driving improved nutrient use efficiency.

Ultimately there should be an economic incentive for farmers to reduce their use of nutrients. However, transitioning to low-input approaches can be financially challenging. This approach should therefore be underpinned by accessible, independent advice on nutrient use and low-input approaches, supported by sufficient incentives. It should enable extensive progress towards farming at the maximum sustainable output of the landscape.

Intensive livestock farming (primarily indoor systems where manure or slurry is collected and stored without sufficient land for spreading within guidelines) is having a particularly severe impact on some catchments.

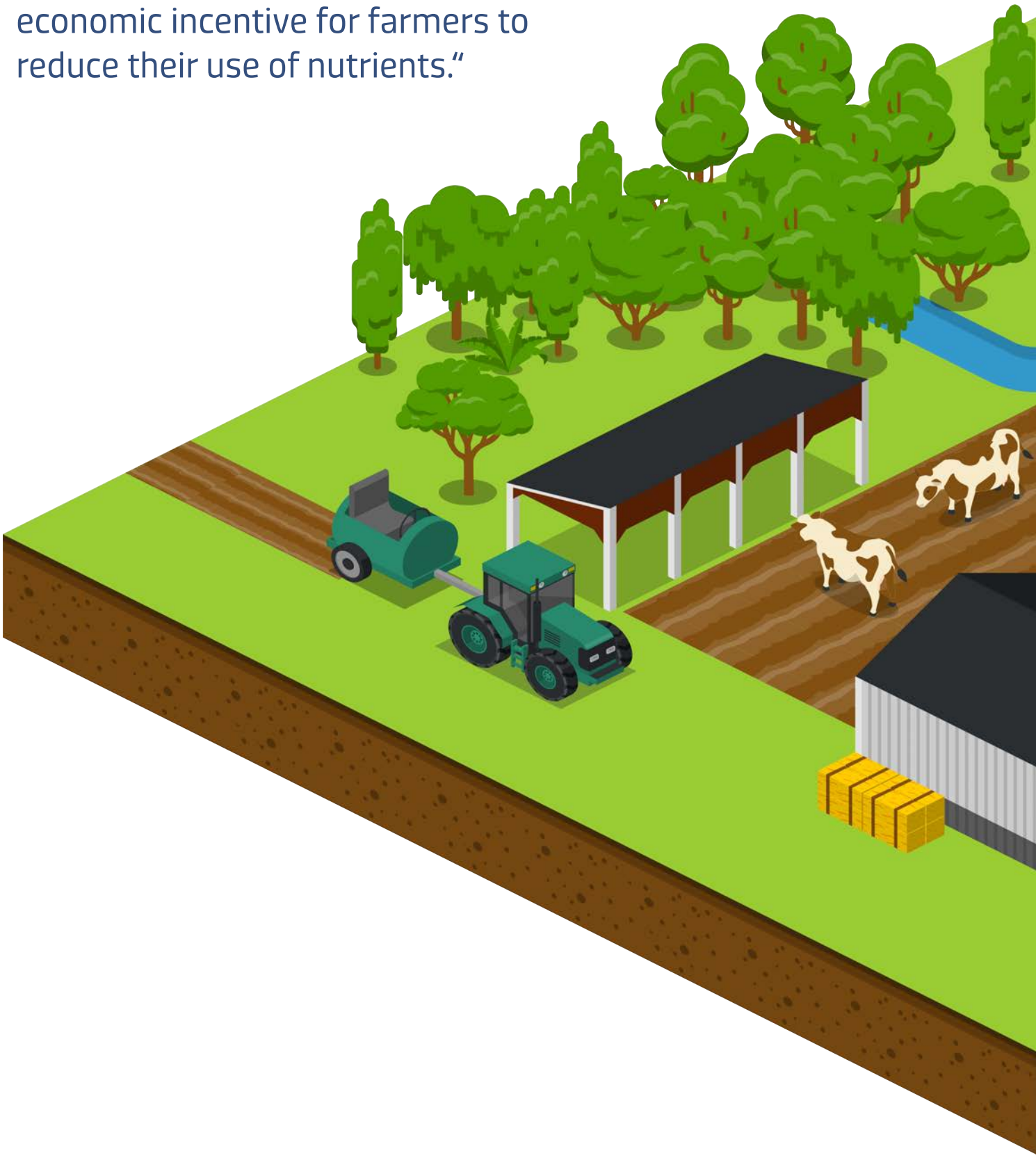
A nutrient management programme should reform planning policy to prevent new intensive livestock units where the catchment is already overloaded with nutrients. Councils should be required to use existing local plan powers to properly scrutinise applications for new intensive units in already polluted areas. At a national level, water pollution should be a material planning consideration.

Planning reform should also include changing the threshold size for which planning permission and a permit is required for intensive livestock operations. Smaller units and indoor dairy operations should require planning permission and be regulated by permits.

In addition to planning reform, the environmental permitting approach for livestock units must properly assess the waste that is sent off site. Whilst a risk assessment is required for an environmental permit for intensive livestock operations, there is no requirement for this to consider the impact of manures sent off site for disposal.

A nutrient management programme should not only embed proper assessment of local impacts from intensive livestock farming and incentivise such units to locate premises in downstream areas of river catchments as opposed to headwaters. It should also increase use of drying and pelletising, moving to embed circular economy approaches to managing wastes in a way which recovers energy and helps to build a renewable phosphorus fertiliser market in the UK.

"Ultimately there should be an economic incentive for farmers to reduce their use of nutrients."



8 INVEST IN MAINTAINING WATER SYSTEMS SO INFRASTRUCTURE UPGRADES ENDURE

Many current water challenges are exacerbated by chronic under-investment in infrastructure maintenance. The next government must regulate for considerably more investment in ongoing maintenance to ensure adequate upgrade and replacement of sewers, water mains and other existing water assets.

Innovation in machine learning and data interrogation must rapidly understand asset condition and target maintenance priorities, leading to a forward-looking approach to asset management planning and delivery. Additionally, innovation in asset design and function should ensure they are optimised to address modern challenges – from carbon to nature recovery – rather than replicating conventional approaches.

Our national infrastructure is crumbling. From schools to hospitals, roads to sewers and treatment works, the focus of most investment has been on new infrastructure rather than maintaining and upgrading what already exists.

This is at the root of the current sewage crisis, the barely registering toxic urban runoff issue, water leakage and the inadequate stewardship of the natural environment in land management.

The replacement rate of sewers is around every 800 years; far longer than their expected lifespan. Telemetry, data organisation, cleansing and interrogation to monitor and understand asset condition and target maintenance, can potentially unlock significant improvements in water network condition and asset efficiency. Enhanced data use would need a stepped approach, moving from cleaning through visualisation, then automation via machine learning.

An increased maintenance focus will need clear regulatory direction to implement. This is because water companies and other private sector infrastructure operators are traditionally motivated to build ever-more new infrastructure to expand their asset base and value.

Our research indicates that before water privatisation, maintaining existing assets was prudent in the absence of considerable funding to deliver new infrastructure.

Whilst water privatisation unlocked major capital investment in new or upgraded treatment works and other infrastructure, the efficiencies private companies were tasked with unlocking came in operational expenditure and capital maintenance. Over 30 years on, we are seeing the results of this unfold.

Water running off urban hard surfaces particularly roads, carparks and industrial estates can be highly toxic to the rivers, streams, and lakes it drains into, often with minimal or no treatment.

Highways authorities should be required to survey their drainage networks for their condition and maintenance need. They must be resourced to then deliver a minimum maintenance schedule. This should enable targeted maintenance to be undertaken on high priority outfalls, as well as informing the implementation of a gradual progression towards more nature-based treatment approaches where appropriate.

Enhanced maintenance investment is needed across our sewers, drains, water mains and more. It will need a detailed, single view of water company, local authority and others' drainage, sewerage, and supply networks to unlock a common understanding of problems and enable a coordinated response. This should be overseen through the catchment system management approach.

For too long, regulators and government have advocated improved mapping of risk management authorities' water assets and their condition, data-sharing, and a coordinated approach to improvement, without there being the investment priority attached to actually delivering these outcomes.

Because they are run-of-the-mill, unglamorous activities they become the silent victims of short-term efficiency cuts, storing up unseen problems that are only now manifesting themselves. For this reason, all new capital investment programmes should be contingent on providing for long-term maintenance for those assets, alongside adequate provision for the maintenance of all existing infrastructure.

"Enhanced maintenance investment is needed across our sewers, drains, water mains and more."

9 ADOPT A 'SPONGE CITIES' APPROACH TO OUR VILLAGES, TOWNS AND CITIES TO UNLOCK REGENERATION, RESILIENCE, PROSPERITY AND A FRESH WATER FUTURE

Regulate for a 'sponge cities' approach to new development and urban retrofit and regeneration through the planning system, applying existing regulation, changing emphasis in water company and other infrastructure investment guidance and building capacity between local authorities and other water management bodies.

Sponge cities are not a new concept and are being delivered internationally to manage demands for growth amidst water – typically flood and drought – crises.

Using the natural functionality of the landscape these conurbations soak up, store, slow down and clean water as it passes through, mitigating against surface water flooding and reducing storm sewage overflows. They make features of the natural functionality to create a sense of place.

In the UK we have our own water crises spanning these same challenges of either too much or too little water, as well as pollution. We also have declining nature and increasing challenges with extreme weather including heatwaves. We have a housing shortage, health and wellbeing challenges and a need for levelling up and urban renewal.

Greening our urban spaces is a win-win approach on all these fronts. We must flip the mindset that treats rainwater as a waste product to be got rid of in the urban environment, into one where it is a treasured resource.

This can be incentivised by more reflectively charging for its disposal based on impermeable area associated with any given property alongside reductions for rainwater harvesting and rainwater drainage not sent to the sewer.

Sustainable drainage (SuDS) describes a raft of features that can be engineered into open space, streetscapes and buildings and can use natural components to deliver these water and other wide-ranging outcomes.

By managing water close to where it falls, SuDS can help prevent water from entering combined sewers which are spilling raw sewage too often, reduce the pressure on sewage treatment works and help treat the toxic contamination that runs off roads and into rivers.

There has been progress in taking SuDS forward in new development, but not enough. This needs to become standard practice and properly mandated by finally implementing Schedule 3 of the Flood and Water Management Act 2010.

Alongside new development, SuDS can be retrofitted into existing urban spaces. This has been done at scale in places like Cardiff, Sheffield and now in Mansfield, solving water problems and considerably enhancing the local environment.

SuDS retrofit need not always be delivered through major schemes and can be done opportunistically and efficiently as other street works, or utility upgrades are delivered.

But this needs commitment and a strategically planned approach to both identifying the opportunities and needs for retrofit, as well as for coordinating infrastructure maintenance to factor in the opportunities. To maximise this opportunity, good practice should be codified through retrofit design guidance and engineers upskilled.

Other approaches such as rainwater harvesting are, again, widely implemented elsewhere in the world and should become standard practice in major developments particularly where there are water resource pressures.

Harvested water can be used for non-potable needs: toilet flushing, garden watering and equipment washing. Smart technology can enhance this functionality to allow it to act as temporary flood storage.

These are the approaches with which we can begin to build a climate resilient nation; water-smart communities equipped to face a future of increasingly extreme weather. The system-level benefits can already be modelled and are compelling.

These approaches have for too long been positioned as a cost-burden for developers, understandably unconcerned for the wider system-level benefits they can unlock. But they are widely-understood and implemented approaches elsewhere in the world that we can progressively work into our own urban fabric – individually small, distributed changes which aggregate into an urban transformation.

> "We must flip the mindset that treats rainwater as a waste product to be got rid of in the urban environment, into one where it is a treasured resource."

10 NURTURE SOCIETY'S VALUE OF WATER THROUGH GREATER AWARENESS OF USAGE

Implement a national-level, coordinated, near-universal smart water metering programme alongside water efficiency labelling, minimum water-using product standards and variable tariffs that include a highly affordable essential use component.

Support water efficiency organisations to develop creative and highly visible campaigns to build awareness of how to use water wisely – both supplies and wastewater.

Whilst there is a clear need for water companies to improve their performance and concerns over this are a potential barrier to the traction water efficiency messaging may have with water users, we all need to treat water as a more valuable resource.

In water-scarce areas this will be fundamental to unlocking the potential for housing growth. Our public engagement found that despite increasing warnings of future supply disruptions in the event of drought, few people thought that would affect them, even in water scarce areas. More than two-thirds of people could not recall ever receiving communications from their water company about water conservation and more than 60 per cent thought their local area would not be impacted by drought.

Water metering is becoming more widespread with around 60 per cent of households in England having a meter, 14 per cent of which are smart meters. Water companies propose to increase this penetration between now and 2050, however water metering is the foundation upon which we can bring the UK's stubbornly fixed per capita water consumption down.

A coordinated national programme would ensure technological consistency and inter-operability for a growing base of smart meters.

Water meters help to build awareness of consumption and there is a considerable mismatch between actual and perceived usage. They help identify leaks, especially in communication pipes between water mains and properties and within properties themselves.

Smart meters can help target advice and, crucially, enable the use of charging tariffs that might include a highly affordable essential use component but incentivise efficiency through rising charges beyond this.

Fears that vulnerable users might be hit by significant increases can be allayed through social tariffs. Alongside a national metering programme, strong commitment should be retained on water efficiency labelling and minimum product standards for water-using products. This, allied to (voluntary) smart metering has been projected to reduce average personal consumption to 82 litres per day by 2065, from 146 litres in 2022.

Our research has shown that people want to find out more about how they use water, where it comes from and how water services impact the environment. Through a 'water values' fund, water efficiency charities should be supported to deliver creative engagement campaigns in schools and communities extensively.

These campaigns should target not only water efficiency, but also how to prevent sewer blockages through disposing only the right things to the sewer. Bans on unflushable wet wipes and other sanitary products which exacerbate sewer blockages should be implemented without delay.

Water companies should be driven to include breakdowns of how bill-payers' money is being spent and citizen science organisations should be supported to share information on local environmental condition. They should calculate, and publish, the natural capital-based costs and benefits of their clean and wastewater operations to improve visibility of non-financial impacts.

"Alongside a national metering programme, strong commitment should be retained on water efficiency labelling and minimum product standards for water-using products."

A FRESH WATER FUTURE