



Briefing

Integrated Water Management and Sustainable Economic Growth

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About the Foundation for Water Research

The Foundation for Water Research (FWR) is an independent community of professionals from across the water sector and related scientific specialisms. The community comes together for deliberative discussion to support the development of interdisciplinary solutions to water challenges.

The FWR Community provides guidance and strategic thought leadership for the Institution of Environmental Sciences' (IES) water activities, and collaborates with the wider IES family on issues related to land, air and policy implementation.

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1. Context, aim and outline of paper

The new UK Government has a prime objective of enhancing economic growth. The Government has identified the following 7 drivers of economic growth:

- A. Innovation,
- B. Infrastructure and Investment,
- C. Competition,
- D. Skills,
- E. Efficiency and Productivity,
- F. Trade, and;
- G. Environmental Sustainability

Therefore, this paper aims to explore the impacts (positive and negative) of integrated water management on the following key matters concerning these main drivers of economic growth – where integrated water management is defined broadly to cover water quality, water resources and flood risk management but many of the points could also relate to the narrower definition of integrated management of water resources and water quality matters (as in the WFD regulations):

- Enhancing capital assets and infrastructure for water and flood risk management, which are important for drivers A and G – see section 2.

- Reducing burdens on business: Section 3 shows that sound and well-resourced integrated water management (and in particular the Water Framework Directive regulations) are well in line with the Department for Business and Trade’s proposed seven behaviours of smarter regulation)
- Economic benefits of improved environmental outcomes (Section 4)
- Promoting the environmental goods and services sector (Section 5)

Section 6 then concludes with an overall assessment that sets out key requirements to enhance the impacts of integrated water management on sustainable economic growth, with the aim of inputting into the Independent commission on the water sector regulatory system and spending review to be completed in spring 2025 and then followed up bi-annually.

Annex I provides a glossary of terms.



2. Enhancing water infrastructure

The National Institute of Economic and Social Research (NIESR) stress that a sound infrastructure is essential for enabling and enhancing sustainable economic growth.¹ They earlier estimated that an increase in infrastructure expenditure (amounting to 1% of GDP) could have long lasting benefits that would raise long run potential output by 0.4%.²

But the state of infrastructure in the UK is currently poor. UK is ranked 24th in the World Economic Forum's ratings. Water infrastructure is in a particularly significantly poor state which is constraining economic growth. For South East Water and in Cambridge, the existing water supply and sewage treatment infrastructure is not able to cater for economic development and its increased water demand.

2.1 Secure water supply

Water availability is a key risk that could constrain technology deployment and economic development of renewable energy projects for the cluster of industrial firms in the Humber area where hydrogen production and carbon capture require large quantities of water. This is likely to be a water stressed area by 2050.

Therefore sound proactive integrated water management incorporating Water Resource Management Plans, abstraction incentive

mechanisms and abstraction trading can ensure security of water supplies to enable economic development to proceed even in water stressed catchments while still ensuring sustainable water resources and environmental safeguards. For example, EA staff in Anglia region collaborated with Pepsico to increase the water efficiency of their farm businesses, cutting water consumption by 30% and enabling them to invest in and grow sustainably their food manufacturing operations in a water stressed catchment. Similarly, the Natural Capital Committee³ reported in 2014 that Walkers Crisps increased the water efficiency of their manufacturing processes which saved £630,000 per annum and enabled them to continue operating in a seriously water stressed area.

The Case for Cambridge report⁴ in 2024 states that expansion of Cambridge represents a nationally significant growth opportunity. But the Environment Agency (EA) have advised that some water bodies in the Cambridge area are at risk of deterioration and that any new development that takes place must not increase abstraction and deteriorate water bodies in Greater Cambridge. Consequently In order for growth in Cambridge to proceed in a sustainable way, the Cambridge Delivery Group (headed by Peter Freeman (Chair of Homes England) and working with local leaders and communities to

deliver these plans) set out a collaborative 2-part plan that set out to:

1. Ensure long-term water supply by:
 - Assuring the delivery of long-term major water supply infrastructure including the proposed Grafham transfer and Fens Reservoir.
 - Supporting development of strategic water resources over the long-term.
 - Using Cambridge as an area for innovation in water management in agriculture and nature-based solutions.
2. Support growth in the short term so that development currently stalled can proceed. The Cambridge Delivery group are supporting increased water efficiency, reuse and offsetting by starting a 'water credits system'.

Water Resource South East (WRSE) estimate that to provide a resilient supply for all customers, (existing and future), to support economic growth, and to enhance the environment will cost £19.3 billion by 2075.⁵ Supplying water for population

growth and additional housing will cost £4.2 billion - 21.7% of the total costs of meeting the predicted shortfall in water supply in the South East by 2075.

The WRSE regional plan relies on the delivery of significant demand management savings – reducing leakage by 50%; reducing household per capita to 110 l/h/d; and reducing non household demand by 15% all by 2050.

Reaching a per capita consumption of 110 l/h/d is reliant on a number of government led actions being implemented that are expected to contribute 300ML/d towards demand savings. These are:

- Mandatory Water Labelling
- Minimum product standards
- Strengthening building regulations

The regional plan also includes stricter planning controls – now enshrined in the Government's final NPPF – as part of the preferred solution to help meet ambitious EIP water efficiency targets which are estimated to reduce by about £550m the costs of addressing the water shortfall and maintaining supply and demand balance.



Figure 1. Source: Futureproofing our water supplies: summary of our revised draft plan for South East England. Water Resource South East (2022).⁵

Should demand management savings not be achieved, further supply schemes will be required attracting additional cost of £3 billion by 2075.

2.2 Adequate sewage treatment capacity

There is high concern about water companies' unacceptable discharges of raw sewage into water bodies. In 2023 there were 464,056 sewage discharges into English rivers, waterways, and seas, averaging 1,271 sewage spills per day.⁶ While 2023 was a particularly wet year, Researchers at Imperial College found that these discharges are fundamentally caused by the chronic under capacity of the English wastewater systems and the inability of Combined Sewer Overflows (CSO) to handle the increased sewage loads.⁷ Justice Holgate in his review of evidence for the judicial review concerning the Storm Overflows Discharge Reduction Plan found that 60% of investigated sewage overflows were caused by lack of capacity due to increased population and impermeable paving.⁸

Evidence of infrastructure shortcomings is provided in Ofwat's recent declaration⁹ that three water companies have:

- Not properly operated and maintained their wastewater treatment works.
- Failed to upgrade assets to ensure they meet the changing needs of the local area they serve. For example, 67% of Thames Water's wastewater treatment works have capacity and operational issues. The firms have failed to monitor local population growth and urban creep. Lynn Parker (Ofwat Director of Enforcement) said that "they haven't been curious enough about keeping an eye on their assets, checking the level of spills, checking maintenance and changing

things so that they won't run out of capacity".

Up to 2015, water companies spent many billions of pounds to upgrade their infrastructure and install new plant (eg holding tanks) to comply with the Urban Waste Treatment Directive (UWWT) which was supposed to provide a water infrastructure "fit for the 21st century". There are the following reasons for the current failings:

1. Inadequate monitoring and enforcement by the Environment Agency (EA) in the wake of the severe cuts in 2015 in their teams at catchment level.
2. Water companies' poor monitoring and operational management as highlighted by Ofwat (see above)
3. Water companies' insufficient capital maintenance and letting their assets deteriorate – since they earn revenue for investments for upgrades.
4. Inadequate infrastructure to cater for recent increased population/housing.

Such inadequate water treatment infrastructure has constrained economic and housing developments. For example, 1450 new homes were proposed in the Bayswater Brook area in the North of Oxford, including a new primary school, nursery, shops, café and restaurants. Building was meant to start in 2024 with development anticipated to finish in 2035. But this development could not proceed because of inadequacies at the receiving Oxford sewage treatment works which has had significant and serious permit breaches since 2021. Thames Water's discharges of raw sewage to rivers is highest in this area of Oxfordshire.¹⁰ Thames water had promised to bring the works up to standard by 2025 through a £130 million



upgrade to the treatment plant, but funding for this improvement was pushed back until the 2030s.

Overall, In August 2024, the Environment Agency objected to all planning applications and the proposed Local plan 2040 that increase pressure on Oxford's sewage treatment works (STW) due to the inadequate sewerage and treatment capacity provided by Thames Water.¹¹ This effectively bans developments in the city of Oxford and surrounding areas. This affected up to 10,000 new homes and 500,000 m² of commercial developments. Thames Water had started to require restrictive conditions that would prevent occupation of a development prior to the Oxford sewage treatment works being upgraded. Thames Water, which has responsibility for sewage infrastructure in Oxford, is developing a plan to address the issue. The application of revised UPM procedures now means that this ban is in the process of being lifted.

Defra's Storm Overflows Discharge Reduction Plan¹² to tackle the sewage discharges problem will require £60 billion of capital investment over 25 years, which is more than double the total annual capital expenditures on the environment programme by the water industry in recent periodic reviews. Therefore this could mean big increases in water bills and/or crowding out of other worthwhile environmental actions by the water companies – as was evident in Thames Water's draft business plan.

Moreover, the previous government had been returning to fragmented silo based water management focused on setting specific targets for particular problems. Defra reports¹³ (p.107) that there are over 15 national plans and strategic documents with a myriad of targets on, among others, sewage discharges, reducing nitrogen, phosphorus and sediment pollution from agriculture, reducing phosphorus loadings

from treated wastewater as well as policies regarding nutrient neutrality which were recently the subject of controversy. They rightly conclude that “We want a more coherent way to enable joined up management in all catchments”. In his speech at the Green Alliance on 4/9, Steve Reid (Defra Secretary of State) said that they will focus more now on the delivery plans rather than just the targets. This hopefully could lead to more efficient solutions through integrated catchment management such as River Basin Management Plans (RBMPs) and integrated options such as nature based solutions and sustainable urban drainage systems (SUDS).

2.3 Housing developments not paying fully for their infrastructure costs

Local Planners have failed to make major housing developments pay fully their Community Infrastructure Levy (CIL) to cover properly their pressures on all infrastructure – including water supply and waste water treatment. Experience of raising these matters at the Inspector's examination of Welwyn Hatfield Borough Council's Local plan revealed that they currently just ask the water companies if they can supply the new houses with water and sewerage treatment, for which the companies have a statutory duty and hence just say “yes”. The Local Planners and Inspector then closed down discussion on this matter.

Water companies have only been charging new housing developments for connection to the sewerage system. They have not charged housing developments for their additional costs to supply water to cater for their increased water consumption nor for treating the increased sewage loads.

Consequently the extra water infrastructure and associated costs have had to be borne through a cross subsidy by all existing water customers. However, due to Ofwat pressures to contain water bill increases, the water companies have not sufficiently improved their infrastructure and have let their assets deteriorate,¹⁴ which has led to the current problems and the high costs now of rectifying them and also constraints to housing developments (see Oxford case above).

In the EFRA Committee hearing of evidence from Thames Water, Ofwat and Defra, Alan Brown MP therefore rightly queried that this runs counter to the Polluter Pays Principle and means that general water customers are cross subsidising the 200,000 new houses built in England and Wales connected to the sewerage system.¹⁵

Community Infrastructure Levy (CIL)

The earlier revised NPPF¹⁶ (paragraph 20) requires that plans for developments make sufficient provision for water supply and waste water; and (paragraph 35) that Local Plans require development contributions for infrastructure (including water and flood management). Also paragraph 180 says that planning decisions should “prevent new and existing development from contributing to, unacceptable levels of water pollution”.

The new Government’s consultation paper on a revised NPPF¹⁷ retains these key paragraphs but has only one mention of CIL.

Water companies need to be able to make major housing developments (of > 500 houses) pay fully for their additional sewage treatment and water supply costs either through LPAs including these costs in the full CIL or S106 payments or through schedule 13 discussions with developers to recoup these additional costs if LPA do not do so. There would need to

be guidance as to what should be a development’s contribution towards the costs of increasing the sewerage system to cope with the extra load that would be necessary to deliver the upgrade in time. But the contribution is certainly not zero – as now – and its determination should be readily resolvable.

This reform would probably need to be introduced gradually (eg for developments not yet approved in Council’s current Local Plans) and well announced in advance. This need not necessarily increase the price of affordable houses. Giving such a clear signal should ultimately lead to such costs being factored into land prices and reduce the large premium currently paid for converting agricultural land for housing. The longer the Government delays in making this signal clear, then the longer that the current cross subsidy and unnecessary increases in general customers’ water bills will persist. Thus BNP Paribas Real Estate report¹⁸ that the examiner of the Mayor of London’s CIL charging schedule concluded that:

“the price paid for development land may be reduced so that CIL may be accommodated. ...there may be cries that this is unrealistic, but a reduction in development land value is an inherent part of the CIL concept. It may be argued that such a reduction may be all very well in the medium to long term but it is impossible in the short term because of the price already paid/agreed for development land. The difficulty with that argument is that if accepted the prospect of raising funds for infrastructure would be forever receding into the future.”

Figure 2 shows that the current excessively high premium residual value for development land (top bar in blue) dwarfs the current provision for infrastructure costs under the Community Infrastructure Levy (CIL - second bar in green).

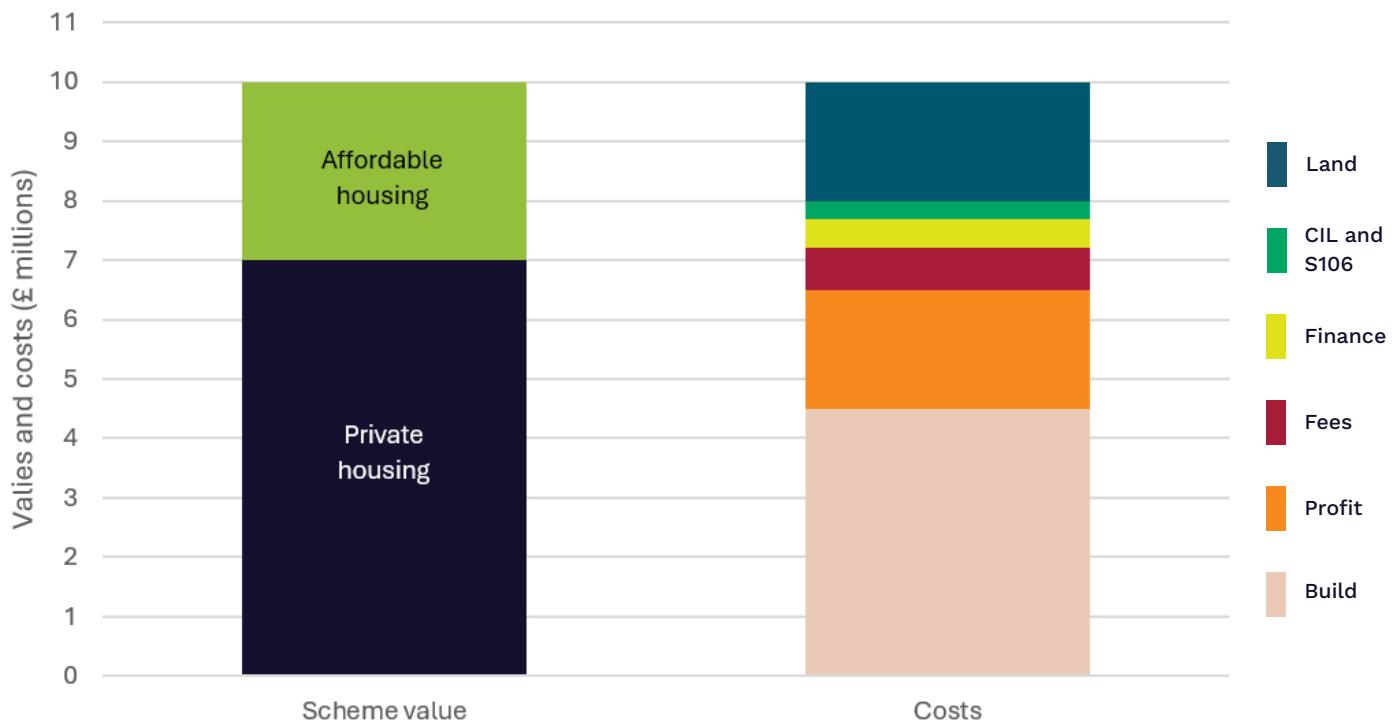


Figure 2. Land value vs CIL provisions for developments. Adapted from Welwyn Hatfield Community Infrastructure Levy Viability Study. BNP PARIBAS Real Estate (2023).¹⁹

This substantiates the case for the changes above to get a better balance between land premium and proper full coverage of all costs of a development. This would provide a market-based approach that would lead to development on lower quality land and retain good quality agricultural land for agricultural production which would have more beneficial impacts on economic growth than its conversion forever for housing.

Annex 4 of the Government’s proposed revised NPPF states that “To determine land value for a viability assessment, a benchmark land value should be established on the basis of the existing use value (EUV) of the land, plus a reasonable and proportionate premium for the landowner.” But, as above, this benchmark value should be determined after full payment of the CIL which should set the real value for

development of the land in question. There should not be any watering down of the CIL commitments. If a development cannot cover fully its CIL, it is just not viable and sustainable and good agricultural land should not be provided for it.

2.4 Flood Risk Management

Effective flood risk management is an essential basis for sustainable economic growth. It reduces the risks and consequences of floods for business which enhances their confidence to invest.

The 2007 floods are estimated to have cost businesses and infrastructure (eg utilities) more than £1.3 billion – about 33% of the total costs (£3.2 billion).



The Environment Agency's Long Term Investment Strategy (LTIS)²⁰ showed that these risks and costs of floods could rise substantially in the near future due to likely climate change. Their favoured strategy yielding the highest net overall benefits (of reducing these rising flood risks) would require a doubling of funding for flood risk management.

Fisher and Johns²¹ showed that it would be difficult to deliver this increased funding under the current system of funding largely centrally through Grant in Aid from HM Treasury which effectively leads to rationing of flood risk investments. They highlighted the need for greater funding by local beneficiaries who the Environment Agency²⁰ estimate account for 69% of total benefits of flood risk measures. Consequently Defra²² developed the policy of partnership funding to share the costs of flood risk management projects using national and local sources of funding.

Flood risks are rising as are their costs of managing them and will rise further in the future with rising populations and likely climate change. Consequently the above problems could be even larger and need to be considered carefully in the spending review and the consultation Defra will launch in the new year to review the existing funding formula to ensure deliver of effective flood risk management for businesses and local communities. Updating the earlier analyses should show a greater need for more funding by local beneficiaries - and not less which would place increased demands on the exchequers that will be constrained by other pressures on government spending (especially for priority activities by protected Departments). The latter scenario would also lead to reverting to blaming the Treasury for increased flooding arising from insufficient funding for local flood risk management.

It will also be essential to prevent new developments increasing flood risks downstream since prevention is better and more efficient than mitigation and clean up.

Thus the latest NPPF²³ (paragraph 159) states that local plans should take a proactive approach to adapting to climate change by taking account of implications for flood risks. They should support measures to ensure future resilience of communities and infrastructure to climate change impacts by, for example, providing space for protection measures (paragraphs 20 and 35) and require that planning policies should make provision for contributions towards effective flood risk management infrastructure. Paragraph 173 states that "When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere... and applications should be supported by a site-specific flood-risk assessment". However it allows for exceptions. Professor Richard Dawson, of the Climate Change Committee's Adaptation Committee, reported that "around 7% to 11% of applications have gone through against [the EA's] advice". It is not clear how much provision LPAs have in fact made recently in CIL payments by developers towards the costs of managing the additional flood risks they cause. But, as with the case of water infrastructure earlier, it is likely to be low and insufficient. The earlier CIL report¹⁵ for Welwyn Hatfield Borough Council's Local plan made no CIL provision for flood risk management.

Therefore, it will be important that LPAs make developers pay fully for the costs of managing the significant flood risks they cause.

3. Reducing burdens on business

We cannot credibly claim that expenditures required for water management per se increase economic growth by increasing spending; nor that our requiring businesses to spend to comply with water regulations increases economic growth. This is because these expenditures have to be paid for by businesses and these resources could otherwise be used to enhance capital assets and increase economic growth. It is any economic development benefits from the environmental outcomes that our activities and regulations deliver that contribute to growth through the valid and important mechanisms set out in this paper (see Sections 2 and 4).

At the same time, there are misguided complaints by some, that environmental regulations are a barrier to economic growth and that removing environmental regulations could boost economic growth.

Some complain – with some justification – that Natural England (NE)’s policy of nutrient neutrality²⁴ restricted some housing developments and constrained economic growth. For example, in September 2021, NE issued guidance constraining development within the Sussex North Water Supply Zone on account of

impact on the Arun Valley Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar Site. This covered a significant part of southern England comprising Horsham District Council, Crawley Borough Council and parts of Chichester District Council, the South Downs National Park and West Sussex County Council. NE declared that developments there could only go ahead if they could secure countervailing reductions in nutrient discharges to demonstrate “Nutrient Neutrality”.

However, rather than castigate all environmental regulations as being draconian barriers to growth, the correct response to such complaints should be to reinstate effective nutrient management by the Environment Agency as an integral part of River Basin Management planning so as to address all pressures and sources of nutrients and seek most efficient reductions in them – including catchment based trading that Natural England tried to engender.

Specific, partial or anecdotal claims that environmental regulations have significant positive or negative economic impacts need to be treated with considerable caution. Morgenstern’s²⁵ retrospective analyses of 34

case studies of US environmental regulations found that there is a tendency to overstate the costs and benefits of regulations in the analyses done before the regulations were issued. Similarly, water companies' estimates of the costs of environmental measures in their draft business plans were about 40% higher than their costs in the final business plans once Ofwat and the Environment Agency had scrutinized their estimates to remove over-estimation of the costs and proposing unnecessarily expensive solutions.

Defra reported that environmental regulation's total net costs were £4 billion in 2012²⁶ (2012 prices - there is no apparent published update of the estimates of the costs of current environmental regulations). The gross costs account for a small fraction of 1% of turnover of all manufacturing businesses. These costs of environmental regulations are lower than other regulations, especially now export and import controls post Brexit. For water industry and waste sector, the gross costs of environmental regulations account for 12% and 2.5%, of their turnover, respectively. For agriculture, fish and forestry, the costs are 3% of turnover. Defra concluded that "The weight of evidence suggests that there is no significant economic impact of environmental regulation".

There is still a need reduce or contain burdens on business. Better integrated water management can and should do this by being consistent, proportionate, targeted and efficient, having well defined timescale and being implemented collaboratively by experienced, skilled and capable environmental managers well aware of business opportunities and needs. These

are well in line with the Department for Business and Trade (DBT)'s proposed seven key behaviours of Smarter Regulation.²⁷

Moreover, sound and efficient integrated water management processes can provide the clear regulatory environment and basis needed to enhance business investment.

The "Porter Hypothesis" expounded in the seminal work by Porter and Linde²⁸ states that "properly designed environmental standards [can] trigger innovation that may partially or more than fully offset the costs of complying with them" – parenthesis added to their use of the word 'can'. Conclusions to take from Porter's work are in fact the following:

- The need for properly designed and implemented regulations and for regulators with strong technical capabilities to work collaboratively with businesses.
- Businesses need to devote their efforts to respond positively and innovatively to environmental concerns and pressures rather than being adversarial and litigious.
- Successful visionary businesses with dynamic corporate strategies have better environmental and economic records.
- There is a need to link environmental regulations with industrial policies to promote innovation and technical changes in businesses and their corporate strategies. This should include dissemination of information and training about latest best practice techniques. Technically capable environmental regulators and trade

associations can play an important role in informing businesses about efficient best practice ways of tackling specific environmental problems.

- Growth is driven by improving total factor productivity, which includes all factors of production such as capital, labour and raw materials. Need to incorporate into this positively natural resources and improved resource productivity that Porter and Linde²⁹ highlight and advocate.
- Greater environmental benefits and improvements in natural capital and infrastructure are needed to sustain economic activity and growth (see Section 2).

Fisher³⁰ set out principles for regulatory design to improve their economic impacts. This draws on recommendations in the literature (eg Porter and Linde²⁸) and best practice guidance for regulations (eg Defra,³¹ Cabinet Office Better Regulation Task Force.

Integrated water management and the WFD Water Framework Directive (WFD) is well in line in the following ways with most of these principles and DBTs' proposed behaviours of smarter regulation outlined earlier. The OEP recommended measures to improve the effectiveness of the WFD Regulations and their application:³²

- a. The WFD is pitched at the catchment scale at which most of the measures are most efficient and effective.
- b. The WFD was developed in close collaboration with other EU countries at British instigation and with considerable UK regulators' expert technical and economic help. The WFD is a valuable model for

efficient integrated water management by other countries outside Europe who can benefit by going directly to integrated water management. This provides good potential exports for UK environmental services to aid these countries improve their water management.

- c. The WFD focuses on environmental outcomes specified in terms of Good Ecological Status (GES) or Good Ecological Potential that is appropriate to particular types of water bodies in specific locations.
- d. The WFD sets out the ambitious long-term objective of aiming to achieve GES. This should prompt businesses to implement real innovation and technical changes to achieve them.
- e. WFD gives flexibility in determining their measures in their River Basin Management Plans to achieve efficiently these objectives and desired outcomes.
- f. The WFD also explicitly allows pragmatically for exemptions if achieving these objectives is not technically feasible or disproportionately expensive. Moreover, the UK managed to secure inclusion of such consideration of costs and provision of exemptions in the implementation of the precautionary controls on Priority Hazardous Substances which could otherwise have been excessively expensive. This ensures that the WFD measures in the RBMPs are proportionate, affordable and do not impose undue costs on business. Accordingly the Environment Agency³³ developed systematic economic appraisal processes for assessing the costs and benefits of options so as to select the most efficient and effective measures to improve the water body in question. For the Second round of River Basin Management Plans

(RBMPs), this resulted in the programme having net benefits of £5 billion and saving £9.3 billion of measures that were considered disproportionately expensive. EA catchment teams now need to be resourced and equipped with training to carry out economic appraisal of options with efforts focused on priorities determined by consultation on cost-effectiveness of options to tackle main pressures so as to realise such efficiency savings in further RBMP rounds.

g. Integrate regulations in associated fields. The WFD integrates water quality and water resource management. This is less costly than dealing with each of these issues separately and sequentially – as was the case with the UWWT. It also can prompt more innovative responses in the programmes of measures

h. Have well defined phase in periods. The WFD is implemented in cycles of River Basin Management Plans (RBMPs) that have to be reviewed and updated every 6 years. This should make the WFD regulatory process more stable and predictable.

i. The WFD is often criticised for being a complex and time consuming process because in reality achieving water management concerns many complex matters. But the integrated regulation in the WFD takes less time and resources than separate regulation of each water matter.

3.1 Economic appraisal processes

In line with the Treasury's Green Book, economic appraisal in Government and for environmental management have traditionally been geared to maximising

welfare. This focus should be retained and not skewed to just on impacts on GDP (a measure of the total economic activities in the economy and reflects the total level of people's income and growth) because water management activities yield important increases in people's welfare and wellbeing that are not reflected in GDP. Thus improving water bodies to good ecological status would yield benefits of about £1.1 billion per annum. But these are mostly non-economic benefits (eg improved informal recreation) which people consider important. We should just document the economic impacts of measures on business.

3.2 Market mechanisms and economic instruments

Economic instruments, market mechanisms or market based instruments are designed to provide businesses with incentives to achieve better environmental outcomes in the most efficient manner rather than requiring them to implement specific measures or achieve particular targets. Such incentives include charges or trading regimes that enable businesses to exchange their pollution reductions so that the greatest reductions are made by those who can do so most cheaply. Such incentives are often supplements rather than substitutes for the regulatory requirements.

Market mechanisms and economic instruments for integrated water management that deliver environmental outcomes more flexibly and efficiently include:

- Abstraction incentive proposals and trading can enable developments to go



ahead while safeguarding the availability of water resources.

- Feasible Payments for Ecosystems services and environmental improvements for which beneficiaries are willing and able to pay. This might be important in funding water improvement measures.

The WFD encourages the use of economic instruments. The environmental regulator and management body in Wales – Natural Resources Wales – have included trialling of a reverse auction scheme to address more efficiently the impact of high nutrient loading in a waterbody. Such reverse auction schemes involve asking polluters (eg farmers) to bid in terms of their costs for measures to control nutrients. The regulator then selects from the bids the most cost-effective suite of options to control nutrients. This is more efficient than just paying grants for the polluters to implement measures.

Article 9 of the WFD specifically requires member states to report on the extent to which water prices cover the full financial, environmental and resource costs of water services. This encourages them to implement charges to cover the environmental and resource costs of water supply, abstraction and discharges.

Moreover and potentially more important in practice, it requires that Member States set out transparently their current subsidies in terms of the extent that water charges or prices do not cover the full financial costs of water services such as irrigation or water abstraction. Such subsidies can distort competition. It puts at a competitive disadvantage UK businesses and farmers with more rain fed production and whose irrigated water supplies are not subsidised.

4. Economic benefits of improved environmental outcomes

Improving the water environment can yield the following economic benefits:

- Commercial fisheries. For example, shell fisheries may benefit from production in cleaner waters that enable higher grade beds³⁴ and sustain shell fish production and do not require extra costs of cleaning the shell fish in less clean waters. In extreme cases, water pollution can threaten the survival of a shell fish operation. For example, excess nutrients, algae blooms and sewage discharges in Belfast's Lough threaten the mussel industry which acts as a natural nutrient filter in the Lough.³⁵ Hence this results in the loss of its important ecosystem service of helping clean up Lough.
- Increased agricultural production from an enhanced supply of water
- Provision of regular supply of water for industry (eg brewing, food manufacturing) and energy generation.
- Rise in values of properties alongside improved water bodies.³⁶
- Savings in water treatment costs. For example, WRC in collaboration with

Moors for the Future developed and appraised a peatland restoration strategy that could deliver £2.5 million of treatment cost savings that exceed its costs (of about £1 million) so that Severn Trent Water included it in its Business plan submitted to Ofwat in September 2018 for PR19.³⁷

In addition, the programme has additional environmental benefits with a net present value of £46 million – most notably carbon benefits (£43 million) and recreation and natural habitat benefits for local communities and customers so that the programme had an overall Benefit:Cost ratio of more than 45. There could then also be opportunities for payments for these services by the beneficiaries through for example carbon credits for the carbon benefits from peatland restoration.

5. Promoting environmental goods and services sector

The Low Carbon Environmental Goods and Services (LCEGS) sector's is an important and growing sector with considerable potential for exports. Integrated water management can assist the development of this British industry, not so much through our regulations per se but by providing clear, coherent long run signals in the form of the following environmental information:

- I. State of the environment reporting on the scale, nature, significance and if possible valuation of the current environmental problems
- II. The likely changes in such environmental problems in the face of likely pressures and changes in scarcity of the environmental assets.
- III. Costs and benefits of options to tackle these environmental problems (eg analysis for the WFD of River Basin Management Plans).
- IV. Scope and need in both England and in other countries for more efficient control technologies to address the cost challenges highlighted in III. This should cover not only England but also other countries, most notably European countries with respect to the implementation of the WFD.

The UK's Low Carbon and Environmental Goods and Services (LCEGS) sector' sales were £205.7 billion in 2020/21 by over 75,700 businesses that employed over 1.2 million people. This is an important sector with great potential for exports.

Table 1 gives sales for LCEGS sectors related to integrated water management.

Sector	2020/21 Sales £m
Contaminated Land Reclamation & Remediation	1,153.6
Environmental Consultancy and Related Services	1,154.7
Environmental Monitoring, Instrumentation and Analysis	225.4
Marine Pollution Control	188.0
Recovery and Recycling	10,066.4
Waste Management	6,729.6
Water & Waste Water Treatment	9,941.4
Low Carbon	1,942.7
Total	205,736

6. Conclusions and recommendations

This briefing paper shows that effective integrated water and flood risk management can enhance sustainable economic growth through its beneficial impacts on the following drivers of economic growth:

- Infrastructure and environmental sustainability
- Businesses' efficiency and innovation (see recommendations VI – VII below)
- And promoting the growing environmental goods and services sector.

Ensuring a secure supply of water and adequate sewage treatment is essential to enable economic development even in water stressed catchments which comprises most of the South East where development opportunities are most pronounced. Similarly, effective flood risk management is needed to underpin economic development in flood prone areas which comprise much of the country. It reduces the risks and consequences of floods for business which enhances their confidence to invest.

However, the water infrastructure in England has deteriorated over the last decade and is now in a poor state with insufficient capacity at waste water treatment plants leading to unacceptably high discharges of raw sewage into water bodies. Insufficient security of water supplies by South East Water and in Cambridge is constraining economic development.

There are therefore the following seven key requirements to realise and enhance these positive impacts of integrated water management on sustainable economic growth. The first is the most essential. But to realise it, Defra need urgently to deliver the wider charging powers (requirement II) and EA will need to streamline its water management processes (requirement III). The further requirements (IV – VII) are then in a roughly descending order of priority.

I) The Environment Agency needs to be adequately resourced, especially at Area level, to provide the effective integrated water management service to deliver the above benefits. This includes having established processes and experienced water managers tuned into local intelligence of likely economic development

opportunities so that they can be catered for by, for example developing the water infrastructure needed and promoting water conservation measures to make room for the developments – as in Cambridge (see S 2.1).

II) For this, EA needs a wider scope of its cost recovery charges on the water industry and other major polluters and abstracters. On 6/9 Defra SoS said that “The Environment Agency will get new powers to recover the costs of their enforcement activity from water companies, and ensure the Environment Agency has the resources, including staff, to take the enforcement action needed to hold polluters to account.” Need to extend EA’s charging powers further to cover work on water permitting, monitoring and integrated development of efficient plans and programmes (eg WINEP, WRMPs and RBMPs) since this work will lower abatement costs. But these functions are currently not eligible costs within current cost recovery legislation, which needs amending to achieve this. Retain exemption from such charges for small farms on pragmatic grounds that they would be too costly to collect.

III) Given the dire state of public finances, EA needs to streamline RBMP planning to deliver this efficiently by, for example:

a. Revert to 80 catchments as the key spatial unit for developing measures (as in RBMP2) rather than the many myriad catchments in RBMP3 which were too many for the EA to be able to service effectively and for major stakeholders to engage with.

b. Focus economic appraisal work on priorities determined after consultation on cost-effectiveness of options to tackle main pressures.

c. Streamline the work by a catchment manager making best use of information on the various pressures provided digitally and by the respective EA leads with liaison by zoom.

d. Ensure that the plans lead to actual measures being implemented.

The costs of this catchment management service are low as a percentage of compliance costs (eg billions of pounds for sewage spills) and could be offset by savings in these compliance costs from the resulting more efficient integrated solutions.

IV) Local Planning Authorities (LPAs) need to make sure major new housing developments pay fully for their costs of additional sewage treatment and water supply and any increased flood risks either through full CIL or S106 payments or through schedule 13 discussions with developers to recoup these additional costs if LPA do not so.

V) Such proper full payments should reduce the current excessively high premium for development of agricultural land. This should not necessarily increase the price of affordable houses in developments. It would provide a market based approach for land use that would lead to development being on lower quality land and retaining good quality agricultural land for agricultural production which would have more beneficial impacts on economic growth than its conversion for housing.



VI) Section 3 shows that better integrated water management can help achieve economic growth by reducing costs and burdens on business and promoting innovation. This involves being consistent, proportionate, targeted and efficient, having well defined timescales and being implemented collaboratively by experienced, skilled and capable environmental managers well aware of business opportunities and needs. The WFD's provisions contain these features and require better implementation – as the Office for Environmental Protection (OEP) has recommended – for which the EA needs to be resourced and trained so that they can yield the sort of cost savings they achieved in RBMP2. These provisions are in line with the Department for Business and Trade (DBT)'s seven key behaviours of Smarter Regulation.

VII) Use market based mechanisms and economic instruments in integrated water and flood risk management such as abstraction and nutrient trading and Payments for Ecosystems Services.

VIII) Promote the important and growing Environmental Goods and services sector with much potential for exports by providing a coherent stable regulatory environment and clear long run signals in the form of assessments of the scale, nature and significance of current and future environmental problems and opportunities for tackling them more efficiently.

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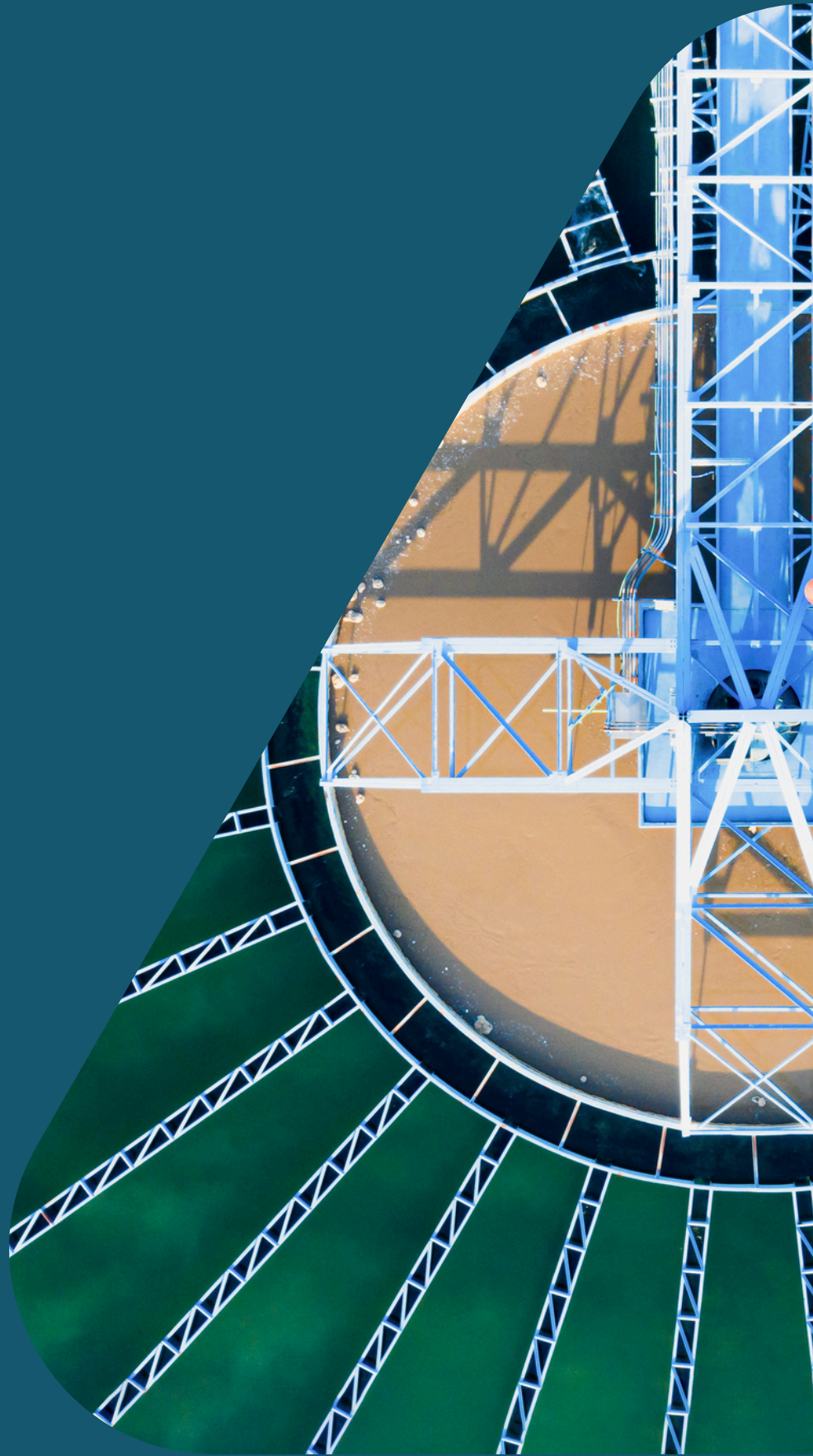
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Annex I: Glossary of Terms

- Environmental Benefits encompass all the benefits of environmental improvements such as improvements to a water body. They include:
 - Non-market benefits which do not feature as improvements in GDP and growth but are important for people's welfare. They include:
 - Use benefits for which no payments is made. This includes formal recreation (eg boating, angling) and informal recreation such as walking and picnicking alongside a river.
 - Non-use benefits where individuals attach considerable importance to an environmental improvements even though they would not necessarily use it.
 - Market benefits for which there are payments or market transactions. These include savings in water treatment costs, payments for increased recreation and increases in tourist expenditure.
 - Economic development (or growth) benefits where the environmental improvements lead to increased economic activities and hence increases in GDP. This can also include where provision or safeguarding of environmental infrastructure and assets can enable or support economic developments in a water stressed catchment.
- Gross Domestic Product (GDP) is a measure of the total economic activities

Acronyms/Abbreviations

- BCR: Benefit Cost Ratio from an economic appraisal
- CIL: Community Infrastructure Levy
- DBT: Department for Business and Trade
- Defra: Department for the Environment, Food and Rural Affairs.
- EA: Environment Agency
- LPAs: Local Planning Authorities
- LCEGS: Low Carbon Environmental Goods and Services sector
- NE: Natural England
- NPPF: National Planning Policy Framework
- Ofwat: Office for Water Services. Economic regulator of the monopoly water companies
- RBMPs: River Basin Management Plans
- SAC: Special Area of Conservation
- SPA: Special Protection Area
- SUDS: Sustainable Urban Drainage Systems
- UPM: Urban Pollution Management. See [Foundation for Water Research \(2018\) Urban Pollution Management Manual Third Edition Version 3.1](#)
- UWWT: Urban Waste Treatment Directive
- WFD: Water Framework Directive.
- WRSE: Water Resource South East



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