Floods, water company regulation and catchments: time for a fundamental rethink

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Floods happen. They always will. The question is how to limit their impact. Short of stopping the rain, there are several obvious strategies: holding water upstream; slowing flows; building walls and other physical barriers; and building resilience into properties. These are all after limiting building on flood plains and ensuring that where this does happen (and it will) making sure the hard surfaces are as porous as possible.

What all these strategies have in common is that they are best thought about in a catchment context, within the framework of a catchment plan. They need to integrate water (and water companies), land use (and farmers) and flood defence providers (currently drainage boards, the EA and local authorities).

Recent events, decisions and consultations – the floods, and the water company periodic reviews, and the proposals for the new Environmental Land Management (ELM) agricultural subsidies - illustrate the fact that there is no integrated approach to managing catchments. All the relevant parties are subject to separate approaches, and separate regulatory bodies. The Environment Agency (EA) is cash limited by the Treasury, the water companies are regulated by OFWAT with a focus on keeping bills down, the farmers are regulated by DEFRA and incentivised through the CAP subsidies and now ELMs. They are all separately covered. This is the backdrop for what should be a fundamental review of what is going on in the water sector.

The recent challenges to each separately have been considerable. The EA has had to cope with multiple floods over several weeks. OFWAT has had to address the lack of public trust for the water privatisation model, years of financial engineering and the adoption of nationalisation as a popular policy by the Labour Party at the General Election in late 2019. DEFRA has borne the brunt of BREXIT (it is the most affected department) and come up with a new and comprehensive British agricultural policy. In

each case, through no direct fault of their own, with each looking to its own mandate, so far they have fallen short of what could and should be achieved. We can do better, by taking a catchment approach and having proper catchment plans and joined up institutions to deliver them. This paper explains why and how.

The floods

Mindful of past experiences which resulted in the loss of its previous chairman, the floods have witnessed a flurry of activity at the EA. Its current chair has been emailing about all the places she has hectically been visiting, and hitting back at any press criticism. This is understandable: in a crisis, it is all hands on deck. Indeed, in the EA's case this is literally the case, switching resources from other areas in its extensive regulatory and operational domains across to floods. They have all been undoubtedly working very hard on floods – and as a result temporarily setting aside the other responsibilities.[1]

The need for a rethink on floods is not because the EA's current leadership and the EA's staff have not been flat out doing what they can in a crisis, but rather because even with this level of dedication and sheer hard work, it has not turned out that well. Of course, nobody can stop the rain, but that is not the point. Words like "unprecedented" and "climate emergency" do not alter the fact that the overall flood defence framework is clearly not fit-for-purpose. That is what these recent floods have demonstrated, and it is why the approach is now to be reviewed, and there is so much talk of combining natural flood defences with hard concrete and about the lunacy of building so many houses on flood plains without addressing and offsetting the flooding consequences on everyone else in the catchments within which they are being built.

Setting the prices and the revenues

[1] The EA claim that this is an advantage of being a multi-functions agency, that it can flex its workforce from one role to another. A moment's reflection indicates that this is nonsense. No one argues that that for example, the electricity network companies should take on other roles, just in case they need extra labour and equipment at short notice. It also neglects the corollary: what happens to these other EA functions, notably the sorry state of waste regulation and enforcement, whilst resources are diverted elsewhere? It is better to argue that the need to switch across resources is a weakness of the EA, not a strength.

The other big player in the water sector is OFWAT. It has the impossible task of setting prices that water companies charge their customers every five years for the next five years. This matters because they determine a whole host of catchment outcomes, fixing the amount of money spent on the catchment, and because water companies not only abstract and clean up water but discharge treated sewerage and allow untreated sewerage to flow into the rivers in storm events, such as in the recent flooding. Those people suffering flooding are getting sewerage not only in their houses but in the river systems more generally.

In the narrow context of regulating the water company's monopolies, OFWAT has never been very successful at picking the prices five years ahead, and this time around within a few weeks of resetting of the prices companies can charge, the share prices of the quoted water companies shot up in unprecedented fashion. In Severn Trent's case the share price moved up to over £26, a premium over its regulatory asset base of over 30%. Contrast this with what should have happened after a periodic review: the market value should be around the Regulated Asset Base (RAB), plus perhaps a small premium, since the new price cap should have captured all the expected efficiency gains, leaving only the possible future abnormal gains (or losses).

OFWAT appears to have got the cost of capital wrong by more than any previous periodic review, and by a big margin. The companies might say that the share price rise was because Labour lost the election, but this is not right. If Labour's threat to nationalise was taken seriously by investors, the share price should have fallen below the RAB *before* the election, and returned to the RAB as the results came in. A 30% plus premium cannot be pinned on political relief from Labour. The fact that the subsequent wider market shocks caused share prices to fall back is a consolation, and it is not enough to describe this as a "flight to safety" in troubled market conditions. The premium was still significant after the biggest equity market falls since the financial crisis in 2008, and OFWAT did not forecast that it would take more than even this sort of shock to get share prices back to a RAB-based market value after the periodic review. The point is that customers are and have been paying too much finance costs for the last 30 years, and will go on doing so probably for the next five. It is not that OFWAT has

done something bad: the important point is rather that it is just impossible to get right, however good the OFWAT team and its supporting analyses.

Worse still, the OFWAT final determination provoked a series of companies to appeal to the CMA, on the very plausible grounds that OFWAT had not provided enough to maintain their assets and to make the necessary investments in the water infrastructure. This means that these companies think that they do not have enough money to spend on their water systems, and this has system consequences beyond the narrow water company remits (as well as within them).

This is serious: companies have with few exceptions baulked at appealing to the CMA or its predecessors, for fear of reputational damage and because the CMA might take away with one hand anything it gives back with the other. Amongst the bigger companies, only South West Water tried this one back in 1994/95 and it did not come out of the process well. The lesson for the companies and their investors has been don't fight, but rather set their overall expenditure to the number OFWAT has set. Perhaps even more worrying has been the desire to protect dividends, so the expenditure turns out to be less what the water infrastructures needs, but rather what is left after the dividends have been paid. It is notable that the quoted companies have been reassuring investors this time around about future dividend policies.

The lessons are pretty clear: the periodic review system neglects important system dimensions, produces sub-optimal spending and has to date provided too high returns to the shareholders. The catchment environment and the customers are not getting a good deal as a result. Any rethink of the water sector needs to fix these faults, as well as tackle the others.

The common elements

Whilst it is tempting to argue that each of these problems in the water sector can be fixed in isolation, this turns out to not to be the case. OFWAT's best efforts to fix the capital maintenance and investment have had a collision with the boards of the companies who are legally liable for failure to deliver the functions. The best efforts of

OFWAT to fix the cost of capital have not turned out well, and the best efforts by the EA have not been enough.

The common feature is a lack of a more holistic catchment approach, which starts not with the business plans of water companies, and the EA negotiations with the Treasury on flood defence spending, but rather on the medium and longer term needs of river catchments. Put simply, what is missing is a joined up *plan*, and a *joined up set of institutions* designed to ensure the catchments requirements *as a whole* are met. There needs to be a catchment plan and a catchment body for implementing the plan. Someone has to be in charge, and neither OFWAT not the EA are properly in charge.

Catchment Plans

Before anyone draws up a catchment plan, it is imperative to sort out the questions to which it is supposed to be an answer. The catchment is the natural unit for thinking about not just the water sector (how could it be anything else?) but also for the wider environment. Look at a map: British geography (and the settlements) is one of catchments.

The starting point is the overarching objective of leaving the natural environment in a better state for the next generation, as set out in the 2011 White Paper, *The Natural Choice*, in turn embedded in the *25 year environment plan* (25 YEP), in turn embedded in the *Environment Bill* going through Parliament in 2020. The 25 YEP has 10 goals, and these include water and water quality, biodiversity, air quality and much else. Some of these are to be given statutory targets. These targets will therefore have legal force and delivering these will be priority questions for any catchment plan to answer.

The addition of *net zero* by 2050 in separate legislation in 2019 gives rise to land use questions on a large scale, as revealed in the Climate Change Committee (CCC)'s report *Land use: policies for a net zero UK* in late January 2020. The best way to divide up that land use into manageable bits is on a catchment basis, and the *Agricultural Bill's* central principle of public money for public goods fits into this geographical framework too.

Finally, the net biodiversity gain principle (which should be net environmental gain) applied to new developments has an obvious catchment context.

Catchments are *systems*, just as are all the major infrastructures. Abstract water, discharge treated sewage, let storm overflows do their overflowing, plant maize near rivers and let the soil run into the river, apply nitrates and pesticides and allow them to run into ditches, build flood defences to force water downriver faster, build houses in the flood plains, and there will be impacts downriver in any catchment. It is an obvious point to make that any serious economic and environmental approach to managing catchments starts with the headwaters and works down the river.

None of this is rocket science. It is just obvious. And yet it is precisely what is not done properly. At the headwaters, in the moors and mountains and the bogs where rivers start, it matters greatly how the land is used. If it is overgrazed because of perverse incentives to farmers through the subsidy regime, if it is ploughed up, or if it is short of vegetation cover, whether it be sphagnum moss or the right sort of trees, then it will take a lot of concrete flood defences downstream to offset the consequences. If farmers are incentivised to allow nitrates and soils to pollute and silt the rivers, then it takes a lot of concrete water treatment works to clean up the mess down river, and dredging barges too.

The EA's multi-functional model

The EA does some of this. But it is hamstrung by two problems. The first is that it has a lot of other stuff to do too. The EA has a vast remit across all the pollution dimensions. It is in charge of lots of waste issues, it has to address air quality and its monitoring (including the EUETS measurements), it has to regulate all sorts of environmental activities including farming, and it has to advise on policy too. It even thinks it should, be an "advocate". Some of this is what an integrated Environmental Protection Agency (EPA) should do. It is enough for any single organisation. But the EA does all this *and* flood defence too. That is why is has such a large workforce, for it combines the day job of what a business does in managing a workforce, contracts, contractors and all the management coordination that being a flood defence agency does, *and* the much more

focussed and technical environmental regulation and enforcement functions. It does all this too at the mercy of the Treasury's short term Comprehensive Spending Reviews, the latest one of which is now underway in 2020.

It is hard to think of any management textbook that would suggest this multifunctional combination of different skills and different activities should be undertaken by any one organisation, and however hard it tries the EA and its board simply cannot do this efficiently. It is just asking too much, and it is no criticism of the individuals involved, that the results have not turned out well.

The EA-OFWAT interface

Being overburdened with many different functions is an enormous hurdle to a sensible programme of catchment plan development and implementation, but it is not the only one. The second is its relationship to OFWAT. OFWAT is not responsible for catchments. It is responsible for regulating water companies and ensuring that the licence functions are properly carried out and met, and to set prices to customers which reflect OFWAT's views of the appropriate efficient costs.

That is what OFWAT has been doing for the last 30 years and it has not been a happy experience. The last 30 years have witnessed largely unchecked financial engineering and systematic mistakes in setting the cost of capital. In addition to these failures in carrying out its narrow economic remit, the trouble is that the formal role of OFWAT does not include following what the EA decides is needed, and it does not operate in a political vacuum. Early on, in the 1990s, OFWAT's first Director General (now replaced by a chair and chief executive) came up with the concept of "affordability", and started to push back hard against what EA's predecessor, the National Rivers Authority (NRA), proposed. OFWAT became the champion of *current* consumers, reflected in changes to its general duties, and started to apply its own assessments of the cost-benefit of environmental requirements. Talk of "an aspirin in a swimming pool" was the way this idea of cost-benefit by OFWAT was played out.

OFWAT was right that customers' affordability is not the same as meeting environmental objectives. The scale of the costs of dealing with the catchments problems exceeded what many customers were willing and able to pay, and what they told their politicians they wanted. The politicians in turn told the regulators that they expected prices to be kept down. Again this is quite understandable – just as successive prime ministers and political manifestos promised to deliver cheap - or at least cheaper electricity whilst decarbonising at the same time.

Reconciling the environmental needs of catchments and customers' willingness to pay is just one of the functions of a democracy. It is a tension that is not going to go away, especially if current customers can dump the pollution costs of their behaviour on to future generations. But the result has been that the aim of starting with the environmental requirements, and then having the NRA and subsequently the EA tell OFWAT what the companies must do, and OFWAT confining itself to making sure these are efficiently delivered has been replaced by a game of equal players, and indeed arguable a dominance of OFWAT (who control the prices and hence the revenues) over the EA. Nowhere has this been more obvious than in the current periodic review.

Sorting out the mess that results

It is not surprising that the result of this institutional competition and muddle has been suboptimal. It means that both the water companies and the EA are forced to focus on the short term, and both end up neglecting the longer term need to come up with system wide integrated catchment plans. OFWAT lives on a 5 year cycle (as do many of the CEOs of the water companies). The EA lives on 3 year Comprehensive Spending Reviews. Both will claim that they of course look longer term, and of course they do. But less than they protest: flood defence ends up with a series of *ad hoc* "bungs" from the Treasury following floods, and it is very hard to reconcile the larger price cuts in the current periodic review in water with a serious engagement with what might be called Water 2030 or even Water 2050.

In designing any environmental planning process and especially a catchment system one, it is unlikely to turn out well unless there is a clear mapping of the plan and the

institutions responsible for delivering it. Someone has to be in charge of the plan, rather than a series of bodies responsible for their own bits of the plan. This is why there needs to be a system planner and regulator, and why the starting point of an efficient catchment approach to water starts with the system regulator. In other sectors this is already obvious. Nobody now thinks the electricity system can function without its System Operator, and the debate is not about abolishing this function, but rather separating the system regulatory parts of this from National Grid, and setting up regional system operators to enable decentralised decarbonisation. The Williams Review in railways has already highlighted the consequences of not having system coordination, from the lack of integrated ticketing to the mess of separate and narrow trains operator contracts. Railways have always needed system planning.

A catchment regulatory model

Who should be the catchment system regulator (CSR) in the water sector?[2] This is where the EA might want to take on an even bigger role. It already does some catchment planning and it has water environmental and flooding duties. Wouldn't it be best to simply grant it even more functions and powers? Was this not what the NRA was supposed to do?

There is some merit in this idea, assuming all the other functions of waste, air, regulation and prosecution and so on are separated off into a new Environment Protection Agency (EPA). But it still suffers from a fatal flaw. For the EA is not a *neutral* catchment planner and regulator. It is decisively conflicted, since it is in the day-to-day business of flood protection works. It is an *operating* business, and just as the ownership of the electricity system operator by National Grid creates a conflict of interest, so too would the EA as both catchment regulator and flood manager.

The obvious answer is to split off flood defence from the rest of the EA, putting the other functions into an EPA. We would then have an operational Flood Defence Agency, and

[2] In earlier papers I referred to this central role with the term Catchment System Operator. I subsequently realised that this is a mistake, for in the model I advance the key institution does not do any operating. The term was borrowed from electricity and the System Operator in National Grid. Even here it is not a good term: there is an operational role distinct from designing and implementing a system plan.

separately an EPA doing the regulation and prosecution functions of an EPA, and that would leave the role of an impartial catchments system regulator (CSR) to do the job of providing an overall integrated river catchment plan and ensuring its delivery. To be clear, the three functions would be separately delivered by a Flood Defence Agency (doing the works), an EPA doing the other functions currently within the EA) and the new CSR.

The new CSR would start with the legal obligations. These are to be set out in the targets (replacing the EU directives) required in the *Environment Bill*, and including net zero. Where these targets are statutory, this is automatic; in the non-statutory cases, this is where an element of political control comes in, with guidance from DEFRA's Secretary of State. This is now a well understood model. The catchment plans that the CSR sets would be made public, subject to wide consultation, and then be adopted. They should be 10 year plans, with a longer term context provided.[3]

The CSR does not do any of the actual works. It deliberately does not. With the plan, the CSR is a *platform* to ensure that the requirements are provided. Many of these can be let as auctioned contracts. This is the neat bit which addresses part of the OFWAT problem. It is quite hopeless to expect OFWAT to get the cost of capital right, and the recent share price movements noted above indicate that it cannot. Rather than try to do this, the CSR invites the water companies to come forward with their business plans (as they currently do) and then asks anyone else to bid against them. Crucially it is the CSR's duty to ensure that the system requirements are met, no longer that of the companies. It is no longer a matter of monopolies simply playing the game of regulatory capture (which they have so obviously been very successfully doing for the last 30 years). It would not be a matter of bundled 5 year contracts: the CSR would be able to offer a variety of short and long term contracts. The companies bid for contracts, and the cost of capital is internal to these bids and hence the companies.[4]

It would not be just water companies bidding against each other, and bidding against the Flood Defence Agency too for flood defence operations and investments. All sorts of

[3] The original period for water was 10 years, quickly shortened by the first Director General to 5 years.
[4] A similar model is proposed for regional electricity systems in the *Cost of Energy Review* (2017)

other players in the catchments would come to the table, of which farmers would be the most obvious. They could bid to reduce pollution run off against water treatment investment proposed by water companies, and to reduce costs by limiting nitrates and bid to hold water in times of flooding events. They could also be bidding at the same time for revenues for carbon offsetting, so bringing new revenues into the catchments outside the immediate remit and control of the CSRs. The government and local authorities could also come to the table, not least by thinking through how best to ensure public monies for public goods are best spent, and subsidies for specific purposes like tree planting. In these cases, the contribution to reducing the risk of flooding would play a part too – bid against hard works the Flood Defence Agency might offer up. The Natural Trust, The Wildlife Trusts, The Woodland Trust and others could offer natural capital flood mitigation too.

As noted, there is nothing new about system operators, and especially where the public objectives are to the fore. Electricity could not function without a national one, and it will struggle at the local level too. In electricity the functions are explicitly to do with security of supply and increasingly with the carbonisation targets, as active demand management, smart meters and smart data and storage come into play. All of these features translate across to water catchments. The CSR would be given duties to limit the flood defence risks, the water quality and biodiversity targets and the implementation on the statutory targets under the *Environment Bill*. Ministers (DEFRA) would provide guidance.

The money

One reason why the catchments have not received the investment and capital maintenance that they require is the costs. Governments of all persuasions are better at willing ends, rather than willing the means. Politicians like to have grand environmental ambitions, but they also want them to be cheap, and they prefer future generations to pay rather than those paying the current utility bills. In this they simply reflect our own responsibilities: we like living beyond our environmental means.

This intergenerational problem, now starkly visible in both the water and the climate domains, is not going to go away. But what it does do is highlight the need to at least make sure we are not wasting money now. Yet this is precisely what the current uncoordinated and dis-integrated approach to the water sector does. We can do a lot more for the same spending in the catchments, and if necessary more for less.

Take any catchment and add up the total spending on the environment – or spending with environmental impacts. Start with what the water companies spend. Add in what the EA spends on flood defence. Add local authority spending. Add the consequences of the agricultural subsidies. Now add in the additional costs: the painful costs of flooding in personal terms, including not least mental health; the costs of lack of biodiversity; and so on. Finally, add in the cost of the contributions to decarbonisation.

Is it possible that anyone could devise a way to get less for this spending in any major catchment? Imagine what the CSR auction platform would do to the value of the bids. Look at the impact on costs that capacity auctions achieved in electricity and the falls in the costs in the renewables generation auctions. Look at all the innovators who could come in to bid to deliver the requirements of the catchment plans. Consider the ways in what workforces could combine functions.

The reasons why monopoly tends to inefficiency, whether it be the EA's monopoly on floods or the water companies' monopoly on water and sewerage services, is that they do not face competitive challenge. What has been learnt from electricity is that it is competition for capacity, competition for renewables generation and, in due course, competition between network investments, storage and active demand, that makes the difference. In electricity, the story of retail competition is more mixed, and in water retail competition has lots of costs and few obvious large benefits. CSRs maximise the competition to provide the elements of the integrated catchment plans, just like the SO in electricity maximises the competition to deliver capacity.

This is *competition with responsibility*. It is the CSR and the electricity SO that is required to deliver the system requirements. The service providers contract to do so, and with all the consequences that follow if they fail to do so. What the summer 2019 power cuts

demonstrated is that these obligations have been well defined in electricity. Failures have been punished and the lessons learnt about whether enough capacity has been contacted for by the SO. That is why the electricity example is moving toward a formal separation of the SO from National Grid. That is also an imperative for the CSRs, separate and independent from the water companies and the Flood Defence Agency.

A final twist

Quite separately from concerns about the inefficiencies and failures in the water sector, BREXIT has thrown up new opportunities and challenges across the environment. In particular, the role of the EU's ECJ in enforcing compliance to the environmental directives is falling away. The *Environment Bill* sets up a new Office for Environmental Protection (OEP). Its remit is to focus on government and public bodies, not private ones. It has elements of a narrow public sector EPA.

There are two immediate problems with this model. The first is its inefficiency. The skill set needed to tackle compliance and enforcement in the public sector overlaps heavily with that in the private sector, notably with the EA. Why have two?

The second problem is that the water companies (and of course the EA) are in the fuzzy zone between the private and public sectors. The water companies are protected by a statutory guarantee that OFWAT will ensure they can finance their functions, and hence their investors have an element of state protection. Whilst it is generally true that the customers rather than taxpayers are responsible for footing the bills, this is also less clear than it might appear. The state has already stepped in to ameliorate bills in the south west, the state will pay for the public goods under the new agricultural ELM scheme with all the impacts this will have a catchment, the state will subsidise tree planting and the state finances the EA.

The ambiguity is apparent: some dimension of catchments will fall under the OEP, some under the EA and some under OFWAT, and the OEP will oversee the EA and OFWAT in respect of any failures to meet the overall environmental directives, but otherwise the National Audit Office (NAO) and others (including the Treasury) step into the frame.

As Michael Gove recognised in his period of office as Secretary of State for the DEFRA there is a good case for merging the OEP and the EA's prosecution and regulatory functions into a single EPA, mirroring what some other countries already do. This would save administrative costs, save the costs of with one overall authority, and neatly fit onto an EA shorn of its flood defence responsibilities. It is one of the opportunities of BREXIT that the UK can have a much better and clearer EPA across both the public and the private sectors, clarity of the duties and obligations in the catchments, and lower costs with the finances that a more open and innovative water catchments market would bring.

Why might it not happen?

What is not to like about this? Or rather: who might not like it? The answer is that institutions develop their own interests, like to get bigger and lobby for larger budgets. OFWAT likes being OFWAT, and the EA likes being very big, with over 11,000 employees. Both, and especially the EA, lobby hard to defend their interests. Indeed the EA wants *more* functions, agitating to have a bigger role in addressing climate change, and taking active steps to get into green finance. All of this is in its adverts for new board members. As mentioned above, they even want to be advocates too.

There is an inevitable bias toward the *status quo*. Changing the institutions, duties and functions takes time. The immediate crises are the priorities, and governments do not tend to be in power for long. DEFRA has had 8 Secretaries of State since 2012 (Spellman, Paterson, Truss, Truss again, Leadsome, Gove, Villiers and now Eustice). But because there is inertia does not make the costs of carrying on with the *status quo* go away. The current set up in the water sector creates higher costs and less environmental gains than it could for the total amount being spent. The periodic review has gone less than swimmingly, the water companies have managed an extraordinary amount of financial engineering without any obvious benefits to customers, and the share prices boomed again immediately after the final determination of the periodic review. The flood defences are less than they could be.

Eventually the costs of the current approaches to the water sector will become too great, and action will follow. Add in the OEP on top, and the costs of current inefficiencies may just be big enough to deliver change, and reap a bonus from BREXIT. Catchments, competition, and the clear separation of functions would bring lower costs, more efficient flood risk management, and more efficient companies. OFWAT would retreat back to its technical role and it could be merged with the other network regulators to further reduce administrative burden and costs, and the EA would split into a Flood Defence Agency and part of an EPA (which would include the OEP).