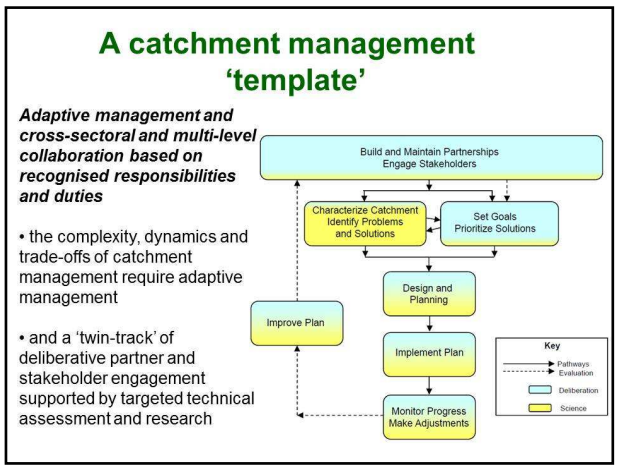
Workshop Report
Catchment Management Innovations:
RELU project highlights and a research agenda for UK Catchment Management
12th October 2012

Concluding national stakeholder workshop for the project:
Innovative Market-Based Mechanisms and Networks for Long Term Protection of Water Resources (ESRC, RES-240-25-0018)
Principal Investigator: Laurence Smith



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12th October 2012, Holiday Inn London Bloomsbury

The aims of the workshop were to:

1. reflect on findings to date from RELU funded research that supports the Catchment Management Approach in England and Wales and the development of Payments for Ecosystems Services (PES)
2. jointly identify priorities for future collaboration and funded research.

The workshop intended to:

- review and update on the outputs of an international and multi-disciplinary team of researchers
- scope possible approaches for long term evaluation and research in support of the Catchment Management Approach in England and Wales
- scope priorities for future research funding bids.

Programme:

08.45-9.15	Arrival – refreshments
9:15-9.30	Introduction: welcome and purpose of the workshop
9:30-11.00	Research showcase: reflection on research and our knowledge base for catchment management and PES
11.00-11.30	Refreshment break
11.30-13.15	Knowledge needs of Catchment Management and PES in the UK and means to support these through research and knowledge exchange
13:15	Lunch, continuing informal discussions and departure.

Background:

The focus of the team's research and knowledge exchange has been how best to protect and conserve water within landscapes which achieve the economic and social goals of the communities affected. Of particular concern has been the deterioration in water quality caused by diffuse sources of pollution in rural areas. Lesson have been derived from three UK Research Council and Defra awards:

- The *Capacity Building Award* (ESRC, RES-224-25-0031) built a network of researchers, water professionals and stakeholders to investigate integrated solutions for water resource protection. Lessons from the UK, USA and NW Europe informed our research agenda.
- *Catchment Management for Protection of Water Resources* (ESRC, RES-229-25-0009-A) investigated how to extend the scientific and social accomplishments of innovative programmes in the USA, Australia and NW Europe to the UK, including testing in two UK catchment case studies. Modelling and communication tools were developed.
- *Innovative Market-Based Mechanisms and Networks for Long Term Protection of Water Resources* (ESRC, RES-240-25-0018) has been investigating how a Payments for Ecosystems Services model developed by Westcountry Rivers Trust and South West Water can deliver water protection and other ecosystem services.

In addition there has a been an effective partnership and knowledge sharing with the RELU funded '*Testing a community approach to catchment management'* project, which used Loweswater catchment in the Lake District as a case study to see how scientists, institutional stakeholders, farmers and residents can share expertise and work together positively for the benefit of their environment.

Summary: central themes and research questions

This summarises key points discussed at the workshop. A near verbatim transcript follows on pages 4-14. The workshop concluded the series of research awards under the RELU programme noted above, and collectively looked forward to future knowledge needs and research priorities. It aimed to be informal and to provide adequate time for discussion. Attendance was limited to 40 participants. It was held under the 'Chatham House Rule' and thus comments are not attributed (although, as agreed, a list of attendees is attached).

Everyone in attendance at the meeting was broadly supportive of the research conducted and the concept of a catchment management approach, but several themes and questions emerged from the discussions regarding future research gaps in support of the emerging policy. These are related to process, governance, scales, integration, evaluation and funding.

1. **Process**

- How can scientific research best support the implementation of the catchment process? For example, through the further development of modelling and evidence based decision-making.
- How can the inevitable research questions that implementation of the catchment-based approach will raise, feed into and drive structured (and policy and practice oriented) research activities? How can continuity of research funding, activity and knowledge exchange be achieved?
- What national facilitators such as knowledge platforms (e.g. the Catchment Change Network Hub initiative) are needed?

2. **Governance**

- How can a wider range of actors and organisations (beyond the Environment Agency and Natural England) be encouraged to collaborate in the governance and management of catchments? Local government, the private sector including food retailers and water companies, environmental charities/trusts, local community based groups, and area based authorities (e.g. National Parks) and partnerships (e.g. AONBs) are important.
- Effective leadership and intermediaries are essential in effective collaborative catchment management. How can this capacity be developed and sustained?
- What is the appropriate regulatory mix of instruments (regulation, voluntary and incentives) for the effective governance and management of catchments? How much local variation and adaptation in this mix is achievable given current national policy and funding mechanisms?

3. **Scales**

- What is the appropriate scale (or scales) for catchment-based approaches?
- Inevitably activity and effective collaboration will develop at different scales, how can a multi-level, multi-scale and poly-centric approach be coordinated and resourced, with appropriate forms of accountability and reporting?
- How can local successes be scaled up to the national level to develop best practice recommendations for scaling down and rolling out?

4. **Integration**

- How inclusive and integrated should the objectives for the catchment-based approach be? Multiple benefits are achievable but should the initial focus be relatively narrow (i.e. good ecological status/potential and WFD implementation) or wider?
- The catchment-based approach must demonstrate the ability to cost-effectively deliver national policy objectives/priorities, but experience suggests that success at local level depends on the ability to integrate these with local economic and social goals.

- If the agenda must be wider how can we better integrate different aspects of environmental management at the catchment scale to ensure multiple and sustainable benefits?

5. Evaluation

- How can we evaluate the catchment-based approach? What outcomes are measurable and can be expected over what timescales? What process indicators are important and useful? What are the benefits in terms of institutional and capacity development, public awareness, attitudinal and behavioural change and other social capital, and what tools/methods are available to measure such benefits?
- How can we improve our economic assessment and valuation of the costs and benefits? Both for ex-ante planning and investment decisions, and ex-post evaluation. What evidence is needed to make the case to the Treasury?

6. Funding

- What new funding sources are available to support the catchment-based approach? Which existing mandates and responsibilities are relevant and funded? How can existing and potential funding streams be best aligned and coordinated by catchment-level partnerships and collaboration.
- What is the scope for development of Payments for Ecosystems Services (PES), and how can this be best aligned to support effective catchment management?

Workshop discussions

Welcome

The workshop will be a 'game of two halves'. First a review and showcase of the work and findings of four RELU programme projects addressing approaches for catchment management. This is intended to further disseminate this work and provide opportunity for comment and reflection. Second an open discussion to collectively identify further knowledge needs and research priorities. Prior discussions with key stakeholders present had indicated the need for this agenda in the context of the launch of the Catchment Based Approach in England and Wales in 2012, and the timeliness for reflection on progress of the 25 Catchment Management Pilots and potential national roll out of the approach to approximately 100 catchments nationwide in 2013. It is also timely to address these issues prior to the national workshop on the Catchment Based Approach and its future roll out to be held in Leeds next week. We had aimed to get 40 key stakeholders together for this discussion and it is pleasing that this had been achieved.

1) A review and reflection on RELU funded research

Presentation of PowerPoint slides 1-18.

Discussion

Q: How did you identify wetlands for the research and NAL-N2O modelling?

- We identified areas that were suitable in terms of whether they were low lying and natural wetlands.
- These areas also had a slope of less than 1.5 degrees. 10% of them had nitrate leaching from livestock.

Q: Were they generally quite productive?

- Generally, yes they were quite productive.

Q: What feedback did you get from the Environment Agency on the models?

- There was quite a lot of interest in the models from the EA. One idea is to make the ECM+ model open source and freely available to everyone; many river trusts have also expressed interest.
- Just a word on the uptake of the model. There is a competing modelling approach available that employs a different ground truthing. It may be worth having a look in case the alternative approach takes off.
- There a number of models available but this approach has the advantage of being developed with the stakeholders. It is an approach rather than a 'black box' that requires a participatory approach to develop a locally specific decision support system.

Q: A question on buy in from stakeholders. What were the views of the stakeholders in terms of changed behaviour? What was the response?

- We had detailed discussions with stakeholders when developing the model. Our experience suggests that this approach can develop shared understanding and the basis for consensus. The process builds trust in the model and the model then allows simulations and management scenarios to be evaluated by a stakeholder group in real time, enabling conclusions to be reached and choices made. We went on to explore costs of alternative management options and responsibilities for implementation. Harsh realities may then limit the scope for change, but we found the approach developed a collective willingness to work at the problem.
- This research emphasizes a twin-track approach – good technical analysis and local deliberation - but we see a more triple track approach emerging in the demonstration test catchments (DTCs). There is trialling of the 'best management practices' (BMPs) which is a separate strand from modelling, decision-making and governance. We need to unpack the science and technology of management options much more.
- There needs to be a unifying approach that looks at the cost effectiveness of models – we (Defra) are just starting a project to do this.
- I agree but modelling of the problems has to be taken forward without pursuing who pays – there are different methods of delivery that can do this. Problems need to be modelled first to determine who is responsible and then a process of looking at how it can be addressed can be engaged in, for example through regulation or other means.
- A critical tool for community stakeholder engagement is the monitoring of problems – the Loweswater project highlighted funding for research by stakeholders. Maybe this is something we could come back to later in the discussion.
- Catchment Sensitive Farming **(**CSF) do have a small grant for monitoring.
- Participants in the Loweswater Care Project are involved in monitoring.
- Monitoring is important because if there is belief in the process then it will end up with delivery. Trust in the process is really important and the monitoring is one way of building it.

Q: Just a comment on developing models and testing approaches. Are we considering outcomes? Is it making a difference? For example, if algal blooms are visible, is the process actually working?

- Of the projects discussed only the Loweswater project could move into implementation of measures with partners, although resources for this were limited to date. Environmental improvements may also require longer time scales. However, the research does demonstrate outcomes in terms of process and impact. Work in the Tamar provides a good example of this. Tobi Krueger has been inundated with requests for application of the ECM+ model. The work with stakeholders has also influenced the Upstream Thinking Project by South West Water (SWW) and Westcountry Rivers Trust (WRT), and laid a foundation for the Tamar Catchment Management Pilot launched in 2012. In addition, the research informed national policy, contributing to the development and launch of the Catchment Based Approach to Water Framework Directive implementation. An independent evaluation of the research impact by the ESRC supports these points. Ultimately, however, the approach and its outcomes rely on sustained implementation by partners and stakeholders on the ground and the research was only for a limited period. The Loweswater Care Project is continuing and is strengthening its partnerships with organisations working at larger scale, and with access to more resources.
- We do need to keep an eye on actual outcomes – are we making a difference in practice? This aspect could be something for discussion later on.
- In rivers trusts adoption of these approaches has enabled us to extract funding. The modelling has definitely provided a basis for proposals and thus measures on the ground that have been funded. It's not clear whether the sensitivity of the model allows us to precisely evaluate the outcomes yet, and actual monitoring by measurement remains inadequate. However, there are other visible outcomes – the research has allowed the introduction of best practice farming techniques for example. So there have been material outcomes from the research.

Presentation of PowerPoint slides 19-37.

Discussion

Q: Did you include farmer age in the survey? Our research in Wales shows that age may be a factor in influencing uptake. There was a definite generational difference. Older and younger farmers were more receptive, while middle age farmers were much more difficult to engage with.

- There was an age dynamic. It depends on whether the farm is staying in the family.
- Did you look at the experience of ELS/HLS agreements? Also, any other long term agri-environment schemes?
- Some lessons may be relevant but we have not directly compared these. They tend to be fixed term agreements of more limited duration and we were exploring the potential for permanent protection/conservation. However, this would be useful to better contextualise the research.
- The introduction of buffer strips is one issue. We also need to consider secondary effects. For example, farmers being allowed to increase stocking density.
- Current agreements used by Westcountry Rivers Trust limit stock numbers, or oblige farmers to buy more slurry storage if they want more stock. It is something that is written into agreements with farmers (using restrictive covenants).
- The restrictive covenants used by SWW and WRT are not necessarily ideal. Our research partners at Cornell Law School, USA, are looking into this issue and are conducting a comparative analysis of practice in the UK and the USA. Aspects are also the subject of a recent review in the UK by the Law Commission.

Q: One question – what is 'appurtenancy'?

- This refers to agreements with adjacent land.
- Effectively what this means is that for the restrictions to hold, the party benefiting from the agreement must hold adjacent land that is effectively benefited by the agreement. If these types of long term land management schemes are to grow and attract funding there is a need for less restrictive and arcane legal frameworks.
- A word on covenants. A normal covenant is between properties whereas we are using it as an agreement between people. Although we can see this working in practice, the system is still being tested. Its adequate for conditionality attached to funding of farm infrastructure that is assumed to have a working life of up to 25 years. It may be less effective for longer term solutions based on land management agreements.
- Can I just say that some of the problems we are facing are not just of academic interest. What is the impact of all of these academic publications? Most people don't really care about them.
- A point well made. As researchers we appreciate the need for different forms of publication and knowledge dissemination. Hence this workshop. The RELU programme has made effective use of short briefing papers and perhaps we should do more of this. However, we are judged on academic publications and citing these is one way of validating the work we present to you (at least someone as read and peer reviewed this work).
- One of the key issues is getting more water companies to go along with this approach.
- We are aware of these issues but already a number of stakeholders are thinking along these lines.

Q: Another aspect not really discussed is whether it is acceptable to pay people not to pollute?

- This is an issue to be considered. However, if you do use incentives and payments for ecosystem services then robust legal instruments are needed.
- We are agreed that there has to be a baseline of good land management practice that is regulated and enforced; clearly a PES payer may not be willing to enter the market for those deliberately polluting. The principle of paying for additionality in PES schemes is well established, but can be difficult to operationalize in practice. Achieving cost-effective regulation is a difficult challenge that we are not currently meeting well.
- A future request for research – there must be a public versus private test on all PES.

- In Defra, we are working on a paper that examines the difference between the polluter pays and paying polluters.
- A key issue to look at is how to engage stakeholders in what payments should be made within the context of an integrated catchment based approach.
- A word on cross-compliance/ agri-environment schemes. We have these schemes but there still needs to be an agreed level of regulation and enforcement of standards.
- In many ways, the 'polluter pays principle' does not make much sense. We have to ask who is the polluter in a system where farmers are forced to produce food intensively by the supply chain, international competition and the public demanding cheap food? Is the polluter the consumer, the supermarket or the farmer?
- I still tend to disagree. I understand that the food market can drive these problems, but why is agriculture an exception as a polluter compared to other industries/sectors? We need regulation in the first instance to ensure parity between good land managers and those that willingly pollute.

Q: Did you consider other PES funding sources such as the Heritage Lottery Funding or mapping Landfill tax availability?

- This needs to be integrated into local planning.
- You could map out Local Authority, Network Rail and other funders.
- We have focused on six leading potential mechanisms for funding but other sources could and should be considered. We have found it difficult to engage with the corporate scale private sector, apart from water companies.
- In PES schemes we see that another important factor is the role of the ethical broker.

2) Future knowledge needs of catchment management and PES

PowerPoint slides 38-41.

Chair: Lets open up the discussion. There are several discussion points I would like to now focus on:

Where should the research go next? Should it examine how the catchment approach develops? The role and development of the catchment management pilots provides an interesting topic and 'population' for study.

Can we frame questions around this approach and the needs of research users in the catchment community to provide support for the pilots and national roll out in 2013?

In terms of national level enablers – how do we make sure that this research is made available? How can we make it accessible? Our discussion should focus on research needs without getting too involved in policy and practice questions today. The national workshop in Leeds next week can further address policy.

Discussion

- I think that integration of flood management and water quality management, and research & development, should be more closely interlinked. Research must be steered towards practical application and policy relevance. The pilots provide an opportunity for this to occur. They can help identify gaps in our knowledge on practical applications between research and policy, and also help develop policy buy-in.
- So we need to be steering research towards policy relevance?
- You need to consider other strands of work as well for knowledge transfer. How can the research link to practical application? It should link to CSF, the WFD and agri-environment schemes. It should aim to produce practical lessons – this could be really exciting work.
- So we could look at how a locally based catchment approach works and then link this back to national policy and programmes?
- One issue you will need to consider is scale. A current concern for OFWAT is how quickly local successes can be scaled up to the national level for developing good practice.
- Scale can be conceived of in different ways. Catchments can vary in scale – from a brook to the Rhine - so a discussion about scaling measures to the effective level of action – and how to get money scaled down too – are critical governance issues. We need to get technical expertise to the scale at which it can facilitate action, and we need to be able to finance this. What scale do you want to use? We have worked at different scales, each with different needs. Inevitably arrangements have to be multi-level and polycentric. So scale needs to be understood. Defra needs to define catchments and scale for the purposes of a national roll out of approach and policy, but this will also depend on the communities involved. This is a really important issue.
- It is evident from the 25 catchment pilots that they are not all full catchments. These also need to have a champion. Social engagement is critical – we are facing intractable problems, so somehow we need to transition from a technical approach to a more social approach with the right leadership. Interaction and social engagement are really difficult and can be a focus for research and the development of guidance.
- In our comparative international research we have recognised the importance of leadership capacity and the role of local champions. Leadership is really important in the examples we looked at, and 'social entrepreneurs' are often significant. However, there are legacy issues. One group we have worked with – the Upper Susquehanna Coalition, USA – is actively considering strategies for what to do when its leader retires.
- You need someone to manage/direct when the organisation is mature – a different type of person is needed when the organisation is mature as opposed to when it is becoming established.
- The Loweswater initiative had a champion who unfortunately passed away, but we did find another local champion to take it forward. For me, understanding how these champions emerge and scale are the important issues. You might have to come down to a relatively small scale to manage some problems and to engender action at the local level.
- A comment on the scale of engagement. The danger is that we focus too much on reducing approaches to a small scale when the system itself may be quite large. We are always trying to reduce scale but the problem is that we could lose effectiveness and coherent impact at system scale.
- What we seem to be missing is that there do exist countryside management and other integrated approaches and designations that could also be utilised. For example, national parks and urban authorities. For example, in the Broads we have been using an integrated approach for 30-40 years, so this is nothing new. However, boundary issues remain a problem. Perhaps 50% of our catchments are outside of our Authority. The catchment approach is forcing us to look beyond our boundaries and to develop new partnerships.
- This is another lesson that we took from international cases including the USA and Australia. You have to work with and within the existing structures for governance and programme delivery. Partnership working, horizontal coordination of actions and vertical integration of responsibilities are key, but easier described than done.

- The focus of the research to date has mainly been on rural areas and surface water. But there are many issues with urban catchments and groundwater that would benefit from more research.
- Points well made. Our research included groundwater through work with the Water4All partners in Germany, Netherlands and Denmark. We also have links with the Wandle River Trust, but have not done much work on urban issues.
- One other important issue not mentioned enough is money. It seems to me that there is an emerging voluntary sector and scaling down is therefore good. But unlike the USA and Europe, smaller groups in the UK are chronically underfunded. We need better capacity and economic sustainability of the local voluntary sector to support the catchment based approach.
- Some quick points to add. Firstly, the experiment with the pilots provides an opportunity for research observation. The research councils cannot just switch off research funding as this issue is not just an academic one and knowledge exchange networks and research continuity are critically important. Secondly, with finance it is critical to align organisations and existing funding schemes together to ensure that objectives are met – alignment is important. Money is available but if it can be aligned more effectively then it can be better employed at local scales.
- There can be so many scales in catchments – groundwater, surface water, local government, national agencies etc. – the challenge is how to achieve coordination.
- We talk a lot about different scales the important factor is leadership and the will to make it work.
- I agree, individuals and leadership are important. But economic wiring is needed. Different scales are not a problem – we are undertaking projects at many scales. You pay your money and you take your choice in terms of funding. In our experience, it will coalesce and self-assemble around the economic wiring, the funding, if its in place. We should develop lessons from the pilots and then roll them out nationally.
- There should be a clear linkage from research needs, through research to research outcomes. The pilots need to demonstrate outcomes for the paymasters to go along with them.
- Time scales are a problem – the pilots have only been running for less than a year. Demonstrating outcomes in terms of water quality for example can be difficult.
- Evaluation could be based on engagement and process, and not necessarily on environmental outcomes.
- Just a word on the scale of funding. There is a need for a high level of strategic planning, with appropriately scaled lower level catchments and local action 'plugged into funding'. The pilots do this and employ catchment working in support of higher level planning. We need to plan research into this. This approach will generate questions for research and development as the infrastructure is constructed.
- Some of this is not new. We should learn from existing and past work on both outcomes and scale. Getting the scale right is important for local engagement and steering. There is a great deal of experience already from CSF, for example, for lesson drawing.
- Some of the discussion is quite nebulous. The key question is what are we trying to achieve? The research can then be focused around knowledge gaps and where there is a lack of clarity.
- In terms of knowledge needs, with water companies it is the cost effectiveness of them switching to PES. Involving water companies in catchment management is potentially a 'gamechanger'. We need more evidence to support this.
- Speaking for a water company already engaged in this, the PES-based approach is purely a sound business decision. It involves business-to-business relationships with farmers based on commercial decisions and identification of the best way to reduce bills for water customers. However, looking at the big picture for sustainability it is apparent that more radical approaches should be considered. In my view, farming is fundamentally broken. Farmers in our region are often desperate – they cannot pay their rent and this leads to unsustainable business practices. Go out into to the countryside during a heavy storm and the damage being done is apparent, whilst effective regulation is nowhere to be seen.
- There has to be more work on economic justification. We have not heard too much about this aspect, and the costs of mitigation measures are important and need to be set against benefits. Some water companies are already looking at this. Also, there are governance considerations

to be further explored. Could the research look at the regulatory/policy mix and what works in specific contexts, i.e. the combination of regulatory and voluntary instruments and incentives? Another important point concerns access to information – technical information is important but often not readily available. We are an enlightened audience here, but technical assessments and challenges needs to be communicated to a lay audience in understandable terms. Research could also focus on defining a baseline level of farming stewardship, i.e. what is the expected level for farmers to follow good practice? It will help build a common understanding of stewardship and agricultural practice, helping allow for the genuine additionality of incentive payments.

- In response to questions about focus and what we are trying to achieve. The overall concept of a catchment based approach is what we are trying to achieve. It is being driven by the WFD but PES is also important because catchments can provide multiple services e.g. tourism, flood defence, biodiversity etc. There is too much focus on agriculture. The government should realise that there are multiple benefits and economic gains to be made. We need to raise the game and promote catchment management as a means to deliver a range of services and sustainability.
- Research needs – Defra recently had to use benefits data from the 1980s for a recent report. More data on values and benefits is required to prove the importance of this approach and support funding decisions in the eyes of the Treasury.
- I agree. From a government perspective there is a need to broaden out the benefits and get the maximum 'bang for the buck'.
- An important principle is to get the industry (farming) to put forward basic standards for stewardship, and thus ensure the industry has 'ownership' of this.
- Of central importance is moving forward on evaluation and ex ante appraisal. A good case rationale and CBA examples do help in government. Connections should be made with investment in green infrastructure and the green economy. On the water side it is not just a one size fits all approach. There are lots of dimensions – we need a broader agenda that includes PES, institutions, and science. We could look at the Natural Environment White Paper – some ecosystems services delivery models were used for this. The role of partnerships and interaction between initiatives was noted. Also, what are the barriers and enablers? For example, legal problems and assurance/accreditation of PES schemes. To what extent are voluntary initiatives and PES schemes occupying the same space for action? Is our perspective sufficiently long term.
- I feel we need to look at the links to other policy areas. The catchment management approach points to an evolutionary process – an evolving story. As the arrangements become more formalised, we can articulate the research questions better. Its does need a formalised and structured approach.
- A major gap is in knowledge exchange. For example, this meeting is only happening because of the RELU research funding. More information is required on the interaction between levels and actors, and on how we can maximise engagement of SMEs. But there are dysfunctionalities between research and practical applications, we need to improve this process. As the RELU programme is almost over, we need to look at how effective research-into-action linkages can be sustained and research gaps filled.
- Another consideration is the context in which farming sits – politically and economically. It is a highly managed industry (both UK and EU). Past policy has given us a legacy to live with. One example is the EU Rural Development funds. We get a small share in the UK because of Treasury opposition to contributing (as it may affect our national rebate). Other EU countries are going to use RDP money to support WFD implementation but we don't get this funding. Another example is the Nitrates Directive which is not operational over the whole country. Another government decision that means that some farmers do not get financial support for slurry storage, another part of the context of trying to deliver the WFD. A research question is whether we sufficiently understand this context? Economic analyses of farm situations are required to understand better how problems are being created and can be solved.
- The farming community is also very diverse. It ranges from small family farms to large corporations and agri-businesses. How best should EU funding be used? If farmers are not paid very well can we also involve the major food retailers – shouldn't they sit round the table with everyone else?

- The farming sector is not homogeneous. Does this support a justification for more locally and regionally diverse approaches and policy? Can existing schemes and funding be more flexible.
- We do need to segment farms. The suspicion is that larger producers receive most of the funding. As mentioned, the RDP could be used to support less well-off areas and and producers but we only get a small share in the UK.
- Lets simplify. Is new money is really needed? Through the Single Farm Payment there is £40m of EU funding going into farming annually in the Tamar. With a one-off budget of that much we could turn all farms into sustainable well stewarded units. What we need is more strategic thinking and solutions such as PES for farming. There is plenty of money out there but it needs spending more effectively. What is lacking is an ecosystem based spatial plan for any given areas to coordinate interventions and use of existing funding.
- Catchment management needs to be given legal status and standing. Its currently an experiment, but it can be used to better integrate other forms of environmental management, e.g. water and land. We need to observe the forms of governance emerging through the pilots. This new governance has to include Natural England, Environment Agency and water companies.
- Current catchment management examples tend to focus on surface water. We need to research the application of catchment management principles to all aspects and levels of land and water management.
- A focus on integration and sustainability through catchment management could include adaptation to climate change. This may help with funding.
- Natural England (NE) is very much involved in the catchment pilots – but could be more integrated. Other NE actions/activities – e.g. Nature Partnership – need to be better integrated. NE recognises the role of supermarkets and supply chains. Co-working and catchment scale planning can improve the effectiveness of existing programmes – e.g. ELS and HLS agri-environment schemes.
- Chair: With regards to 'baseline' stewardship, should this be left to the farming industry to decide? Or should local pilots decide this? The working groups of the Tamar Pilot are looking at the branding of local produce for example. This could set stewardship standards for their area. Secondly, there are multiple potential benefits for sustainability from a catchment approach but is it too much for the pilots to perform this role? Is it better to adopt a narrow focus on water quality recognising that this will generate incidental benefits, or should the goal be multiple benefits from the start?
- We have to look at other ecosystems services, for example biodiversity and flood defence, to generate an integrated approach. As for retailer engagement – it is really difficult. They are only looking to the regulator. There are emerging carbon offsetting schemes but interest is mainly local.
- Some supermarkets are starting to get involved. In terms of multiple benefits, there is an abstraction reform agenda, with an impact assessment due next year. It may highlight how businesses are getting involved and provide a driver for their involvement. A major research question is how do we reconnect people with their catchments? We have lost this contact and understanding, particularly in urban areas. If we can understand how to reengage and reconnect people, then it will enhance the process. Have we looked abroad, for example to continental Europe? There is a mixture of approaches, from the polluter pays to more voluntary – the latter provides a better linkage between people and their catchments.
- We are developing a model at UEA to examine the multiple aspects of catchments nationally, but there are data problems working at this scale. Google Earth tools are being developed for knowledge exchange for the Wensum Demonstration Test Catchment.
- Supermarkets are getting involved with the environment. There is the Institute of Grocery Distribution (IGD) work on water – though its really concerned with the notion of own corporate risk (physical supply, increased cost, reputational risk). Leading companies are now looking at their water use and practicing recycling and conservation.
- Catchment management is a collaboration, the rivers trust movement will work closely with the EA, NE, Defra, NGOs, and water companies. It is also about integration and finding out who does what best. More CBA will be valuable and can be a powerful tool for influencing

the Treasury but it will remain difficult to value some benefits. As well as outcomes we need to put a value on the social capital that is developed by and for the process. This is a resource to deliver more sustainability for society. We need to describe and demonstrate our achievements in this respect. For research there are two key areas: 1) putting a value on all benefits where possible, 2) determining mechanisms for funding.

- Implementation of the catchment based approach and associated policy will generate many researchable questions. Again we need to make sure the research is structured to meet the needs of the process and its actors.
- A final plea – we need to define the benefits of the catchment approach. How do people value the benefits?
- The community represented at this meeting has travelled a long way in the last few years. For us, catchment management is a no-brainer and is the way to go nationally and globally – but more understanding is required to achieve effective implementation and desired outcomes. We must further develop the links with research and other stakeholders.

Other information resources cited:

- The Catchment Change Network based at Lancaster University is developing a public engagement tool as a Hub to further support the catchment based approach and its wider public engagement.
- A quick plug – the Environment Agency is going to steal the 'adopt your catchment/watershed' idea from the USEPA. This may attract funds and volunteer action.
- RELU have produced a recent briefing paper on PES.
- Another plug for our catchment based newsletter for the pilot projects. Sign up via CIWEM if you don't receive it.

Chair: thank you to everyone for their time and contributions today.

List of Delegates

Jacqueline	Atkinson	DWI, Defra
David	Benson	University of East Anglia
Dylan	Bright	Westcountry Rivers Trust
Richard	Cole	Defra
Keiran	Conlan	Cascade Consulting
Hadrian	Cook	University of Kingston
Laurence	Couldrick	Westcountry Rivers Trust
Damian	Crilly	Environment Agency
Tim	De Winton	Environment Agency
Helen	Dunn	Defra
Bob	Earll	CMS/CIWEM
Maria-	Fernanda Aller	Promar Int. Ltd.
Martin	Furness	OFWAT
Robert	Harris	University of Sheffield and Demonstration Test Catchments, Defra
Kevin	Hiscock	University of East Anglia
Simon	Hooton	Broads Authority
Nick	Hopwood	Environment Agency
Ann	Humble	Welsh Government
Alex	Inman	Independent consultant
Stuart	Kirk	Defra
Anne	Liddon	RELU, University of Newcastle
Bob	Middleton	Catchment Sensitive Farming, Natural England
Chris	Mills	Environment Agency
Lisa	Norton	Centre for Ecology and Hydrology, NERC
Liz	Oughton	University of Newcastle
Michael	Payne	Advisor to NFU
Paulette	Posen	CEFAS
Arlin	Rickard	The Rivers Trust
Anne	Robson	OFWAT
Emily	Rockett	Cornell Law School
Martin	Ross	South West Water
Neil	Runnals	Centre for Ecology and Hydrology, NERC
John	Russon	Environment Agency
Laurence	Smith	SOAS, University of London
Steve	Smith	URS Infrastructure & Environment UK Limited
Russell	Smith	Westcountry Rivers Trust
Marion	Walker	Catchment Change Network, Lancaster University
William	Watts	Environment Agency
Seeseana	Wright	Ouse & Adur Rivers Trust, Arun & Rother Rivers Trust