Managing risk and uncertainty within the water industry - an economic regulator’s view

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There are increasing demands to predict the response of river catchments, whether due to climate change, land management or urbanisation. Such predictions are inevitably uncertain, if only because the future inputs to the catchment cannot be known accurately. As a result, risk-based tools for use in robust, adaptive management strategies will be crucial for prioritising decision-making in the face of uncertainty. Major future investment will depend on the methodologies selected and guidance is needed to inform and benefit this process. Catchment Change Network is exploring the ways in which the latest scientific methodologies can inform this process. The Catchment Change Network (CCN) brings together a broad range of scientists and practitioners to consider the assessment of future changes across catchment systems. It is intended to enable the exchange of knowledge between the NERC research base and science user community to understand and manage uncertainty and risk related to future changes in catchments.
Over the last three years the Catchment Change Network (CCN) has organised a programme of workshops and meetings to discuss and develop guidelines for incorporating risk and uncertainty into the management of catchment change in the areas of flood risk, water scarcity and diffuse pollution. This final international conference will present the progress made in CCN and other projects during this time. A particular focus will be on the research needs in both modelling the impacts of change at scales of implementation and on stakeholder involvement in the management process.
• Risks and uncertainty in the Water Industry
• Climate Change
• Catchment Management
• Risk based thinking going forward
• CCN and lessons
Van der Sluijs, UPEM Conference, 2007

“In this process of scientific assessment of environmental problems… (decision makers)… face large, partly irreducible uncertainties, knowledge gaps and imperfect understanding. At the same time the decision stakes are high, values are in dispute and potential error costs of wrong decisions can be huge.”

“Stakeholders’ reasoning, observation and imagination is not bounded by scientific rationality; this extended perspective can be beneficial when tackling the ill structured and complex policy problems. Consequently, the knowledge and perspectives of the stakeholders can bring in valuable new views on the problem and relevant information…….”
Water Industry Stakeholder views

Customers - vital for life services, low value of water

Investors - low financial risks, safe returns

Companies - own the risks, traditionally risk averse approach

Economic regulator - needs to see balance of risks
Operational risks

no supplies
sewer flooding
drinking water contamination
pollution incidents

In control, only the future and change could halt this

Water today, water tomorrow
Achievements since privatisation

No longer the dirty man of Europe

£90 billion of investment in infrastructure

Leakage reduced by about 35% from its peak in 1990s

Improved environmental quality

Delivered with a low cost of capital
Future challenges

- Climate change – drier summers, wetter winters
- Increased demand because of population growth and distribution
- Environmental regulation – WFD to cost £30 billion to £100 billion
- Increasing problems of affordability and bad debt
- Rising consumer expectations
Ofwat sets the expectations for addressing risks and uncertainty in the water industry.

Future climate change, future levels of demand, longer term strategies, embed carbon thinking.

Predictable business, narrow uncertainty range -> Stable service to customers.

Need better information, advice.
Challenges

- a changing and unpredictable climate;
- population growth, particularly in the south-east of England where water is already scarce;
- economic uncertainty and the consequent affordability issues this raises;
- rising environmental standards, including implementing the EU Water Framework Directive; and
- rising consumer expectations from an increasingly sophisticated customer base.
Planning and uncertainty

uncertainty

act now
flexible action

right choices

right systems
right information

Water today, water tomorrow
more integrated, catchment approach
water efficiency targets
value water
understanding consumers’ behaviour
abstraction policy
Climate Change

Challenges
adapting to a changing climate
reduce emissions

but at what cost?

opportunities for innovation

We need
long term thinking
up to date evidence base which is readily accessible, easily interpretable
pragmatic guidance
applicable models
The National Audit Office - the cumulative cost of water pollution to be between £700 million and £1.3 billion a year in England and Wales.

Water UK - potential for £26 billion for priority substances in the WFD.

Ofwat supported £5.3 billion for wastewater and environmental schemes in AMP5.

£460 million to deal with diffuse pollution at water treatment works in AMP5.

Ofwat supported £52 million for catchment management capex (just over half for moorland restoration).
Catchment Management - The evidence and delivery gaps

Uncertainty
- Climate change timescales

Emerging benefits?

Unfairly applied and costly mitigation measures?

Prioritisation, co-ordination and alignment

Water today, water tomorrow
**Catchment Management**

**Temporal and spatial considerations**

**Upstream catchment management benefits**
- treatment costs savings
- reducing GHG emissions
- improving biodiversity
- storing carbon
- stabilising river flows
- timescales

**Integrated catchment management**
- safeguard zones
- chemical investigations programme
- WFD Impact Assessment
- mitigation timescales

*Increasing uncertainty*

*Water today, water tomorrow*
Catchment Management concerns

emerging benefits
timescales
economic justifications

uncertainty

Regulation Voluntary

Incentives PPP, PGP, BPP

sector accountability
cost effective solutions
customers WTP

Water today, water tomorrow
A risk based framework

how risk should be defined, as applied to the water and sewerage sectors in England and Wales;
• the different types of risk and their potential impacts;
• how risk might be best allocated;
• how we can develop incentives to effectively manage risk; and
• how risk allocation may need to change if the future structure of the water and sewerage sectors were to change significantly.
Delivering proportionate and targeted regulation – Ofwat’s risk-based approach
Current international thinking and research in catchments - flood risk, water scarcity, diffuse pollution

stakeholders

evidence base-sound science
enhancing climate change prediction knowledge
flood warning modelling
stakeholder debates on water demand management

CM
scales of farmer/landowner engagement
partnerships
evaluation framework

Knowledge Hub
Future Research

Understanding/anticipating change eg. The climate

**Catchment Management**
Emerging benefits
Pollutant pathways
Scaling up mitigation measures/food productivity
Baseline of good agricultural practice/stewardship
Economic justification
Tradeable C

**Water Demand**
Spatial variability of demand
Impact of food production changes
Embedded water in foods
Water efficiency - what works?
Behavioural economics

**Floods**
Risk projections
Stakeholder engagement

Good practice guidelines?

But....
local engagement
simplify the language (audience)
usability
research priorities
Our vision – sustainable water

Sustainable water
“An sustainable water cycle in which we are able to meet our needs for water and sewerage while allowing future generations to meet their own needs”