



**WATER SECURITY**  
Knowledge Exchange Programme



## Specific Priority Subject 3.1 Summary Report

### Assessing the Value of Water

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## Acronyms

WSKEP      Water Security Knowledge Exchange Programme

## Acknowledgement

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## Summary

This report is the Summary Outcomes Report of the WSKEP Specific Priority Subject Workshop 3.1 on 'Assessing the Value of Water'. It includes an introduction reporting the key recommendations resulting from the Workshop. This document will be made available on the Programme website [www.wskep.net](http://www.wskep.net). The full Participants Outcomes Report was distributed to all participants of the Workshop.

## Disclaimer

This document reflects only the combined views participants at the Workshop.

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# 1. Overview

## 1.1. Introduction

Assessing the value of water at various stages of the natural and managed water cycle is recognised as an increasingly important component of water resources and supply / demand management to achieve acceptable water security for all stakeholders and end users.

Access to water is acknowledged as both essential for natural ecosystems and a fundamental human right. Basic methodologies and systems for pricing drinking water and wastewater services to domestic and industrial end-users are well established in some countries. However there is limited evidence of widely accepted methodologies that enable a holistic valuation of natural freshwater water resources or recycled wastewater in the context of ecosystem services, environmental value, water trading and competing agricultural, industrial and domestic freshwater demands.

It is also believed that most domestic consumers have limited knowledge of their tap water usage and unit costs and even less understanding of their much larger embedded water footprint and associated water value or costs in all foods, goods and services supplied to them. The impact of policy changes in the valuation, cost and pricing mechanisms for water are therefore difficult to assess with regard to human behaviour and attitudes on water related services and usage.

New approaches are needed for assessing the value of water to improve and balance future water resources management to achieve equitable and affordable levels of water security for human and natural environmental needs.

## 1.2. What is the big science issue / challenge

Workshop delegates debated the contextual presentations and brought further perspectives on the challenge of valuing water. Determining the value of water was considered to be a much more complex topic than pricing for different water services to different end users and different locations. It was noted that, even in the UK, different end users (domestic, agriculture, industry) may willingly or unwillingly pay a different price for water in the same water stressed catchment region and that they probably have a different time and risk valuation framework for access to water. Therefore water value and allocation includes complex social, political, legal and economic interactions within national, regional or catchment water ecosystem and environment contexts. A single value versus many values versus price and ability to pay, were also prime areas of discussion, thought to need further socio-economic academic study.

The return, “used-water,” flow from end users was considered to have potentially a different valuation framework linked, in some global regions (EU), to “polluter pays” principles of allocating and recovering costs to protect subsequent human and environment water needs. The valuation and pricing framework for return “used-water” flow was thought to be less well understood and communicated to the general public and most end-users than first-time, freshwater access. A framework for valuing reuse of water of different qualities for different applications in areas of different water stress was considered as a key area for further development.

The concept of water foot-printing of products and services to end users was recognised but also challenged as not being equivalent to carbon foot-printing, because, unlike carbon dioxide, the (negative) environmental impact of human water use was not the same across different regions of the globe. It may become a useful tool, to increase awareness and communicate the value of water to the general public, politicians and multiple stakeholders, but the science and granularity of data to determine water footprint, impact and value required further development to be meaningful at local and global scale. The impact of the potentially polluted return water footprint may be as important, or more important, than the first time abstraction impact in terms of valuing export of water stress or water pollution in products and services from different global regions.

Human attitudes and trust in water quality and water access routes as well as convenience, was considered to be a very important component in value decision making. This was thought to apply in a wide range of situations from the “bottle versus tap” debate, through the public versus private water supplier to differentiated supplier trust and reputation in potential future domestic competition as practised in the energy and telecoms utility sectors. Concerns were raised on the future competition / metering agenda as to how to communicate and avoid customer confusion on potential multiple supplier tariffs for water as found in the UK energy sector.

The topic area least well represented by delegates and presenters at the workshop was that of natural environment and ecosystem valuation of water. This was acknowledged as probably an artefact of a competing UK workshop on these specific aspects held on the same day in the Yorkshire region with EA, Defra and academic delegates.

### **1.3. Making the most of current research activity**

In general, it was noted that there was not a large volume of UK academic research funded on the wide spectrum topic of valuing water. Some NERC and EPSRC funded projects were described but surprisingly little ESRC funded work was identified by either workshop organisers or participants.

### **1.4. Areas for future research and collaboration**

Fourteen outline propositions were championed, developed and clustered into nine topics that were prioritised by a simple 3 votes per participant process. Details are presented in the workshop write up.

The highest scoring issue was to review how effective the current UK regulated water sector framework was in valuing and balancing local versus national water security including domestic and agricultural needs. Phrased as “if we had a blank sheet of paper, how would the UK choose to manage water, now and for the future”? Defra is known to be reviewing some aspects of water resource security and customer competition through a Water White Paper and an academic challenge to further develop and evaluate radical new local to national scale concepts received strong support. Exploring a public attitude to “water as a national treasure” concept could also be linked into this area. However, this broad topic is not a pure valuing water research area and could have high consequence political, regulatory and economic policy implications beyond the scope of this specific workshop participants’ field of expertise.

The second highest scored area was additional primary research in willingness to pay and valuation methodologies of water for both ecosystems services and different end-use applications. This could include how to compare different valuation frameworks and trade-offs in policy development for water in domestic, agriculture, industry, energy and environmental sectors.

Two other areas were strongly supported; valuing wastewater / recycling water as a resource and building a dynamic GIS based interactive map / model of the available / predicted volume, flow, quality and end user valuation / demand / timing for access by all UK water regulators and end-users. This might support both longer-term water resource investment planning by multiple end-users and a future shorter-term water trading framework.

## 2. The workshop and report

This workshop was the seventh in a series being run on behalf of the Water Security Knowledge Exchange Programme (WSKEP) with funding from NERC. It was organized by the University of Surrey.

Nine Priority Subjects were identified at a national consultation event held in June 2011. The theme of this workshop was '**Assessing the Value of Water**'.

The workshop was designed to support the following key aims:

- increase awareness and uptake of research outputs in the focus area of 'assessing upstream methods of land/water management that improve water quality and quantity'
- identify user needs and potential future research projects
- strengthen research/user group collaboration and networks

The workshop was divided into 4 sessions with initial presentations (available separately) as follows:

**Session 1      Setting the scene and making connections**

Introduction: Alan Jenkins, CEH Wallingford

**Towards a shared understanding of Priority Subject Area**

Introduction: Tony Rachwal, University of Surrey

**Session 2      Making the most of current research activity**

Introduction: Keith Weatherhead, Cranfield Water Science Institute

**Session 3      Identify areas for future research activity/collaborations**

Introduction: Neil Runnalls, CEH, Wallingford

**Session 4      Alliances, networks and advice to the WSKEP**

Introduction: Neil Runnalls, CEH Wallingford

The heart of the workshop time was devoted to opportunities for participative working among the 30 delegates. This report features the outcomes from those interactions as written up by delegates during the sessions. As such this report is primarily aimed as an ‘aide memoire’ for participants.

Elements from this report will be used to inform further development of the Water Security KEP.

### 3. Towards a shared understanding of the Priority Subject Area

Table groups discussed the contextual presentation by Tony Rachwal, University of Surrey, and noted key insights and issues, supported by a brief narrative, that enrich the Priority Subject Area as follows:

3.1	<ul style="list-style-type: none"> <li>• Does H2O foot printing have real value?</li> <li>• At what scale does data become meaningful?</li> </ul>
3.2	<ul style="list-style-type: none"> <li>• Return flows/polluter pays (value/consequences)</li> </ul>
3.3	<ul style="list-style-type: none"> <li>• Are we including all stakeholders? We need to start with the public (even schoolchildren)?</li> <li>• A shared understanding of the subject area – key insights/issues</li> <li>• Is all water the same value? Can wastewater be an asset?</li> </ul>
3.4	<ul style="list-style-type: none"> <li>• A single value vs. many values vs. price</li> <li>• Sustainability – flexibility &amp; uncertainty</li> </ul>
3.5	<ul style="list-style-type: none"> <li>• Value &lt;&gt; Price &lt;&gt; Ability to pay</li> <li>• Water as natural resource &lt; customer behaviour &gt; full retail competition</li> <li>• what sort of catastrophic event will lead to a step change? (stand pipes in London during the Olympics through to impact of a nuclear accident)</li> </ul>

### 4. Making the most of current research activity

This session gave participants the opportunity to learn more about current research programmes and to make new connections to add value to research taking place. Keith Weatherhead, Cranfield Water Science Institute, gave an overview of research projects.

Individuals then gave a short introduction to research work they were involved with. Other participants had the opportunity to connect with programmes that interested them. Comments were captured, and participants logged their interest. 16 connections were identified across 6 research programmes.

## 5. Identify areas for future research activity / collaborations

Neil Runnalls CEH Wallingford, gave an introduction to funding programmes in this area of work. Through table group discussions, individuals were invited to identify key propositions where further research/activity could be of value in taking forward this Priority Subject Area.

Fourteen propositions were developed. These were roughly grouped in common themes by participants and further insights added.

Ref	Propositions for further research / activity
5.1	Value of water in the environment
5.2.1	Additional primary research into willingness to pay for ecosystem services
5.2.2	How do you trade off the different values for water in different policy contexts
5.2.3	Developing a mechanism to assess and compare the different values of water
5.3.1	Understanding how all customers value water. Where to focus?
5.3.2	Improve understanding of users to get them more engaged re. value
5.4	Water as a national treasure
5.5	Build a dynamic GIS map of the flow, quality and value of water
5.6.1	Large scale vs. localism
5.6.2	National Water
5.6.3	If we had a blank sheet of paper, how would the UKI choose to manage water, now & for the future Focus on the Institutional Frameworks
5.7	Model global investment/return for different UK water valuations
5.8	Value of wastewater
5.9	Identify synergies between agriculture & utilities around management of water E.g. Reservoir storage

### Prioritisation

Following the discussion, delegates were given 3 sticky dots to indicate the three propositions they believed should be given priority consideration. The table below shows the results of this prioritisation:



Ref	Proposition	Dots	Position
5.6.1	Large Scale vs. Localism	17	<b>1</b>
5.6.2	National Water		
5.6.3	If we had a blank sheet of paper, how would the UKI choose to manage water, now & for the future		
5.2.1	Additional primary research into willingness to pay for ecosystem services	12	<b>2</b>
5.2.2	How do you trade off the different values for water in different policy contexts		
5.2.3	Developing a mechanism to assess and compare the different values of water		
5.4	Water as a national treasure	11	<b>3</b>
5.8	Value of wastewater	10	<b>4</b>
5.5	Build a dynamic GIS map of the flow, quality and value of water	9	<b>5</b>
5.1	Value of water in the environment	5	<b>6</b>
5.3.1	Understanding how all customers value water	4	<b>7</b>
5.3.2	Improve understanding of users to get them more engaged re. value		
5.9	Identify synergies between agriculture & utilities around management of water	3	<b>8</b>
5.7	Model global investment/return for different UK water valuations	1	<b>9</b>

## 6. Improving alliances and networks

Neil Runnalls, CEH Wallingford gave an overview of alliances and network approaches that help foster research and practice in this area.

Delegates, in table groups, were then invited to make suggestions for steps to further improve communication and networking, as follows:

Ref	Suggestions to improve networks/communication
6.1	Missing new government group - Natural Capital Committee - Water should be on their agenda and they may have research questions & needs
6.2	Stronger links between supply chain (new group) and research - more funding/resource at demonstration stage
6.3	Helping industry and academia to engage with one another Broader industry: food & process, energy sector, ICT companies

6.4	Long term signal of opportunities to develop alliances to win & deliver big projects
6.5	Alliances for integrated water management (e.g. utilities, municipal, national water partnership)

## 7. How do we maximise the value of the Water Security KEP?

Table groups were invited to suggest ways to maximise the value of the Water Security Knowledge Exchange Programme, as follows:

Ref	Insights for WSKEP
7.1	Expand scope to EU to better share knowledge and experience (Regulatory environment very similar but little awareness of what is being done in other countries)
7.2	Study day(s) (initial first view from industry experts. Potentially funded research (MSc, PhD, etc) or interesting projects to work on or some "free", or at least cheap, consultancy)
7.3	Act as a centre point for publicising all water related workshops through website. (Makes sure relevant people (and especially decision makers) can see everything which is going on and make decisions about which few to attend/identify most important)
7.4	Create an innovation hub (eg face to face, online forum, industry cluster, showcase success, identify future needs)
7.5	Increased networking with supply chains (e.g. drinks, energy, food etc.)