

Business engagement in valuing and implementing water-related ecosystem services: making the case for the agrifood sector.

The initial workshop was held in Kenilworth on May 14th 2013, with the objective of exploring what water and ecosystem services/ footprinting tools and data are currently available and being used by different groups working in the agricultural domain. Through sharing information on current activities among a group of representative stakeholders, the intention was to identify any obvious gaps and concerns about accessibility to relevant information which could be addressed by subsequent programmes of research or knowledge exchange.

The outputs from this workshop were also intended to inform the development of further regional workshops or other activities in order to ensure that the agri-food sector is in a position to make the best use of available tools and data in adopting an ecosystems approach to their use of water resources.

From the private sector, James Spurgeon of Sustain Value presented an overview of freely available water tools developed by the WBCSD for high-level evaluation of the business risks and opportunities. There are a range of tools being used by corporations operating internationally, with implications for those along the supply chain in terms of understanding what sort of data might be required from them in order to complete water footprinting or the sorts of water evaluation calculations which might inform compensation payments. Others are risk evaluation tools, to identify supply chain vulnerabilities and uncertainties. He also trailed a new tool due to be published late in 2013:

WBCSD 'Business Guide to Water Valuation: An introduction to concepts and techniques'

Lisa Norton outlined the work being undertaken by the public sector, (CEH) to develop underpinning knowledge and data sets which are or could be utilised in development of models. Taking an Ecosystems services approach is seen as a good way of linking the previously siloed research relating to water and to soils and also integrating this with the social sciences. Combining the extensive experimental and observational data that CEH generate into conceptual models will facilitate further development and deployment by different users.

Shamal Mohammed of the AHDB summarised the current concerns of farmers and growers relating to water and ecosystems services. The challenge for them is how to maintain and secure their water supply & mitigate risks to create a more sustainable and resilient business, in the face of increased uncertainties of supply, increased competition with other users and increasing demand for food production. Arable, horticultural and livestock sectors are all working on a variety of tools to address the problems of maintaining water quality while improving water use efficiency, from guidance to farmers through to the use of precision irrigation and further biotechnology developments to improve water use efficiency and drought resistance. Water benchmarking has been used very successfully by different sectors such as Dairy and Potato sectors and there is more work being undertaken to develop an irrigation scheduling tool for the horticultural and potato growers. Water is seen as a key part of future research, with the Cereal division about to produce a water road map and the Horticulture division developing a water research strategy. AHDB recognise the importance of seeing soil and water as a continuous system and is investing in soil research to improve water availability and quality and they have also commissioned ADAS and SRUC to produce a Resource Use Efficiency Tool to quantify the environmental and economic impact associated with farm management decisions in an integrated way, to help growers and producers optimise decisions about the use of resources – including water – to both increase productivity and reduce adverse effects on the environment.

Finally, Stuart Kirk of Defra/ Environment Agency spoke about the work currently going on around Payments for Ecosystems Services and some of the innovative examples from the Upstream Thinking programme in

the South West, compensating farmers for loss of income from livestock production when stocking densities and productivity were reduced to provide improved water quality.

Workshop Output:

The subsequent workshops provided an opportunity to discuss the following points:

1. What tools are currently available for different stakeholder groups to work with, who is using them, are they delivering what is needed and how could they be improved?
2. What data is currently available, who holds/ provides the data, is it accessible to all who need it? How could the data and access to it be improved and what additional data is needed? Could that data be made available from public or private sources or will it need to be collected and collated?
3. Given the tools and data sources previously discussed and the gaps already identified, what are the barriers/ obstacles to making them operational? What projects could be developed to address these at a local/ regional level?

Summary notes from each group's discussions are on the following pages. Participants noted that there is a plethora of tools already available, some attempting to integrate different elements but at a high level that may not be particularly useful to farmers, although they might be adapted for catchment/ landscape scale management. The Cool Farm Tool was highlighted as operating at a useful farm scale but as its focus is carbon footprinting with some possible additions around biodiversity, it may not be that useful for integrating water management and ecosystem services. There are also many specific tools that operate at the farm scale, particularly for nutrient management, but which have not been produced to be integrative. In discussing who uses these tools the point was made that there are many different tools being used by different users without integration and it was suggested that there was a requirement for mechanisms to enable (potential) users to be aware of relevant tools and informed as to how they should be used (RELU had previously fulfilled a similar role). Tools need to be tailored to the needs of the user rather than to addressing an issue and it was also clear that better use might be made of intermediaries such as LEAF, FWAG, CFE, Rivers Trusts and Landbridge.

In discussing data availability and accessibility both groups identified problems for users, especially farmers, with establishing what is available and where it is kept, with frustration expressed at the inaccessibility of data from private sources such as water companies (due to commercial confidentiality), from the Rural Payments Agency (again citing confidentiality) and university researchers where costs were again involved. However, it was acknowledged that there was a lot of data available from the public sector, chiefly CEH and the EA, with additional data becoming accessible from satellites and the virtual data observatory.

Finally in exploring the question of what projects could be initiated to overcome some of the obstacles identified, Group 1 suggested a project to demonstrate Ecosystem Services on a catchment scale, identifying one possible candidate as the River Arrow catchment in Herefordshire. This is a mixed farming area so many farmers and growers would be able to readily identify with what was being made visible and that the value of services and the relative risks/trade-offs would become apparent.

Group 2 came up with 2 possible projects: *Resilient Farms in a Resilient Landscape* and *A new funding regime (or payment for ecosystem services)*. The former would identify data gaps and address them at a demonstration project. The latter would identify mechanisms to show where benefits accrue, who stakeholders are and ultimately develop a new funding model.

Water and Ecosystem services – Workshop – Group 1

What tools are currently available for different stakeholder groups to work with, who is using them, are they delivering what is needed and how could they be improved?

The group identified three existing tools:

1. Sustainable Agriculture Initiative (SIA)

- This is essentially not a 'tool' but a platform or framework for the development of sustainable agriculture worldwide, which allows those developing market 'tools' to respond.
- It is an inter-company, global, collaboration platform the world's top food and drink companies (35 Active Members) and their supply chains. Companies include the likes of Unilever, Pepsi, Mars, Nestle.....
- It is a web-based, corporate level platform now in its 'adoptive phase'.
- The group summarised the platform as one that delivers visibility and allows for meaningful conversation between the supply chain and farmers.
- Key elements of the framework that were mentioned included resilience, efficiency and biodiversity.
- Criticism of the platform ranged around the fact that it was not developed from a 'systematic review' of existing platforms/tools and that only seven indicators of inputs to ecosystem services were included. Note that the 'Cool Farm' tool (see 3. below) is essentially the carbon footprint element of the SIA.
- Improvements that could be made to the SIA include making it more 'fit for purpose' and easy to use for small businesses. It is not presently at 'landscape' scale (apart for Cool Farm).
The view was also taken that the platform should be continuously improved to take into account new research outcomes. *There followed a wide ranging discussion about monitoring services and honey bees, which whilst fascinating, did not add much to the workshop objectives.*
- Whilst the framework was developed by and is being used by the top worldwide food and drink companies, it is available for use by whoever wants to use it.

2. World Business Council tool (WBC SD)

- This tool was widely seen as being unwieldy, expensive and for large or higher-scale/global use only eg. By the UN, WEF, FAO.
- The users of this tool can be found on the WBS SD website. There are 15 Case Studies detailed.
- It was felt that the tool looked more at impacts rather than benefits.
- On the positive side, the tool was free to use and could be adapted for use at a landscape level in future.

3. Cool Farm Tool

- This tool focuses at present on farm level carbon footprints for crops and livestock. It is free for use by farmers. It is designed to inform farm decisions and reduce environmental impact.
- The tool is easy to use and its development was based on scientific rigour.
- The group were noticeably excited about the opportunity for expanding the tool for biodiversity measurement (the Dutch are presently researching this), nutrient balancing, water demand efficiency, resilience and community engagement.
- The primary producers and their supply chains are presently getting behind the expansion and adoption of this tool.

What data is currently available, who holds or provides the data, is it accessible to all who need it? How could the data and access to it be improved and what additional data is needed? Could that data be made available from public sources or will it need to be collected and collated?

1. Environment agencies

Web-site data is presently available for farmers. A new application is being developed by the EA to make the data more accessible/available.

2. Rivers Trusts

Some ecosystem mapping data was available for sediments and pollution pressure areas. The West Country Rivers Trust was seen as ahead of all others in this. This model could be built upon for other catchments eg. Catchments in the Thames or East Anglian areas.

3. Centre for Ecology and Hydrology

Significant environmental monitoring data sets available free of charge (EU Environmental data reporting obligations).

4. Rural Payments Agency

The group expressed some frustration that this huge data set resource was presently inaccessible for commercial sensitivity reasons. There would be great value in accessing data on cropping patterns and distribution of crops at the catchment level.

5. Water companies

Largely inaccessible for apparently commercial sensitivity reasons.

6. Space

Opportunities for space imagery data and the Environmental Virtual Observatory project.

7. General and funding

The group felt that there would be value in the water companies sharing data with farmers.

At the same time, the value of availability to farmers of the vast data sets listed above was questioned because of farmer's using pragmatic 'best practice' approaches to running their businesses.

What scope was there for water companies supporting ecosystem services? The companies are seeing growing benefits to them in this support, funding or otherwise.

The question of how to get companies (other than water companies) to pay for ecosystem services was discussed.

The issue of the different level of interest and engagement in ecosystem services between land owners (eg. National Trust) and renters was raised.

Given the tools and data sources previously discussed and the gaps already identified, what are the barriers/obstacles to making them operational? What projects could be developed to address these at a local/regional level?

Project title:

Demonstrate Ecosystem Services on a Catchment Scale

- The group agreed that 'visibility' of what could be achieved at the catchment level would be of significant value. The value of services and the relative risks/trade-offs would become apparent.
- The River Arrow catchment in Herefordshire was suggested as an ideal area to model. It is an area of a mixed farming (from strawberries and apples to potatoes and livestock) and economic community. It was agreed that an upland catchment would not be ideal for this project.
- It was essential that data sets, particularly local data sets, should be made freely available and shared by all involved in the project (open data). Data could be hydro-geological, socio-economic (from Chambers of Commerce), rainfall ...
- The delivery partners for the project should be based around local community agencies eg. The Bulmer Foundation, together with academic input from, say Worcester, Reading and Harper Adams Universities together with the AHDB.
- Outputs from the project would be available for everybody to use eg. The River Trust, Hereford Council, Tourist Board...
- The project timescale was estimated at four to seven years.
- It was noted that there is a DEFRA funded activity under way based around a 'demonstration catchment'
- The project could conceivably fit under the Agri-Tech Strategy but this presently only goes 'up to the farm gate'. This project needs to progress right down the supply chain.
- Funding could also be found under the EU Framework Blueprint initiative of Policy Integration.
- Subject to the successful delivery of the project/model, it could be expanded/adapted for climate change and other scenarios to maximise the delivery of ecosystem services.

Water and Ecosystem services – Workshop – Group 2

What tools are currently available for different stakeholder groups to work with, who is using them, are they delivering what is needed and how could they be improved?

Our group took a very different approach to that adopted by Group 1 in that they started to reel off individual tools rather than integrative tools such as those that Group 1 referred to:

- **PSYCHIC (Phosphorus and Sediment Yield Characterisation In Catchments)**
<http://eprints.lancs.ac.uk/49695/>
- **Farmscoper** <http://www.adas.co.uk/Home/Projects/FARMSCOPER/tabid/345/Default.aspx>
FARMSCOPER is a decision support tool that can be used to assess diffuse agricultural pollutant loads on a farm and quantify the impacts of farm mitigation methods on these pollutants
- **Planet** <http://www.planet4farmers.co.uk/>
PLANET, MANNER-NPK and ENCASH are nutrient management software tools that are freely available for use by farmers and their advisers. These software tools have been developed by ADAS and are maintained and supported by ADAS.
- **Tried and Tested (Nutrient Management)** <http://www.nutrientmanagement.org/>
- **Irriguide**
An irrigation scheduling system to take account of variable rainfall, soil texture and cropping pattern
- **GreenBox** <http://www.leafuk.org/leaf/farmers/greenbox.eb>
The Green Box is a simple, step by step approach to monitoring the environment on your farm. It is simple and practical to use and provides guidance and advice on what you might see and when. Divided into four sections - biodiversity, soil, water and air.

After a while they gave up trying to name tools and suggested the types of tools that were used, with occasional illustrations:

- Water Footprinting tools (Waterwise, Simply Sustainable Water, LEAF water management tool)
- Hydro(geo)logical models (FEH, Modflow etc)
- Sustainable Soils
- RB209
- Climate Change tools
- Valuation tools (many)
- Biodiversity tools
- Supermarket Codes of Practice (Nurture, Leafmark...)
- Smartphone Apps

One of our number, an academic researcher, volunteered some generic research tools

Scoring systems
Booklets
Guidance tools
Mapping tools (GIS)
Predictive tools
Codes of practice

Templates
Online tools
Legislation
Monitoring
Syntheses
Accreditation

Tools are used by a wide variety of organizations and individuals including:

Farmers and Advisers, regulators (i.e. Environment Agency, DEFRA), researchers and others such as Rivers Trusts, Natural England, ADAS.

On the question of whether they deliver what is needed, there was much debate about what actually is needed and so this became a bit involved. It was agreed that different users have different needs and that there was a plethora of tools, each addressing different aspects of the issue and probably each delivering what is required of that individual tool but with insufficient integration.

On the matter of how they might be improved, the group suggested that there was a requirement for mechanisms to enable (potential) users to be aware of the tools and informed as to how they should be used (it was suggested that RELU had fulfilled a similar role). Such mechanisms might include:

- Signposting
- Guidance
- Case studies and business cases for using the tools
- Farmer champions who could undertake peer-to-peer knowledge exchange
- Supermarket compliance schemes and ranking of suppliers based on performance (peer pressure)

It was proposed that tools need to be tailored to the needs of the user rather than to addressing an issue and that better use might be made of intermediaries such as LEAF, FWAG, CFE, Rivers Trusts and Landbridge.

What data is currently available, who holds or provides the data, is it accessible to all who need it? How could the data and access to it be improved and what additional data is needed? Could that data be made available from public sources or will it need to be collected and collated?

The group gave many examples of data sets that were held:

- Habitat (Natural England)
- Pollution (Environment Agency)
- Valuation (Agents, Insurers)
- Water level (EA, CEH, Water Companies)
- Water quality (EA, CEH, Water Companies)
- Water flow (EA, Water Companies)
- Meteorological (Met Office)
- Farm Census
- MAGIC maps
- What's in your back yard? (EA)
- Catchment Abstraction Management Strategies (EA)
- Visitor numbers (Local authorities, tourist authorities)
- Satellite data (various)

Others that hold data were listed as:

- LEAF
- Retailers
- Academic researchers
- IACS/RPA

*The issue of access to data was felt to be a mixed picture, with public sector data being theoretically accessible but probably more available than accessible – without knowing **what is available** and **where it is** kept it is difficult to access data. The general view was that public sector data is (are) becoming more accessible. Privately-held data, however, was seen as being inaccessible since it is mostly collected for commercial purposes and therefore has a value or is confidential and not for resale even if there is a willingness to pay. The issue of access to data held by academics was a vexed one since in some cases it is necessary to pay but some is open-access (with a trend towards open-access but some problems regarding the costs involved). Once again, the issue of **'what?'** and **'where?'** was raised.*

The group ran out of time to discuss the matter of how access to data might be improved. It was, however, agreed that better quality data are required, including information that allows users to determine the validity of the measurements and applicability in different circumstances (meta-data) as well as the raw data. Several expressed the desire to have more geospatially correlated data sets (GIS-tagged).

Given the tools and data sources previously discussed and the gaps already identified, what are the barriers/obstacles to making them operational? What projects could be developed to address these at a local/regional level?

1. **Project title:** *Resilient Farms in a Resilient Landscape*

Who?

Farmers, advisers, other change agents, retailers and supply-chain companies

Focus

Identify needs, data and information to address those needs, find synergies

Partners

Levy boards, CFE, LEAF, Academia (HAU, RAU...), The Allerton Project, NFU(?)

Deliverables

Definition of what a resilient farm is and what a resilient landscape is

Identification of gaps in knowledge regarding resilient farms and landscapes

Demonstrator site(s) to put ideas into practice

Behaviour change has been enabled so that farmers feel able to act on recommendations

Funders

AHDB, DEFRA, NERC(CEH), Natural England, TSB(?)

2. **Project title:** *A new funding regime (or payment for ecosystem services)*

Who?

Farmers – better incomes

Society – better informed and better environment due to greater uptake by farmers (more ESS)

Retailers – reputational benefit

Focus

Quantification and valuation of interventions. Appropriating value and redistributing it.

Shifting from compensating for costs incurred (HLS) to payment for services rendered

Partners

Royal Agricultural University/Harper Adams University, Natural England, Environmental economists (UEA?)

Deliverables

Identification of mechanisms to show where benefits accrue and who stakeholders are

Comparison with schemes operating in other countries

Ultimately, a new funding model

Funders

Water companies

Insurers

Local Authorities

DEFRA