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AGRICULTURE & INNOVATION



# EIP-AGRI Focus Group

Water & agriculture: adaptive strategies at farm level

## Co-operative water management

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## 1. Introduction

Given the pressure on water supplies for agricultural, domestic, industrial and environmental uses during a time of climate change, there is a need for farmers to work collaboratively with other water users (farming and non-farming) to improve the integrated management of water resources.

When considering adaptation strategies to cope with limited water availability on the farm, solutions will inevitably be focused on identifying and adopting practical on-farm techniques to improve the ways that soil and water is managed by farmers.

However, all farmers operate in an increasingly regulated environment. The EU Water Framework Directive and the EC Blueprint for Water propose ambitious targets for the improvement of water quality and freshwater ecology. Whilst it is clear that farmers need to conserve water for crop husbandry and economic reasons, they also need to do so for regulatory reasons – particularly where over-abstraction is contributing to a failure to reach 'good status' in the local catchment.

Therefore, it is vital for farmers to understand the principles of 'good water governance'<sup>1</sup> and 'water stewardship'<sup>2</sup> and to ensure that, by operating in collaboration with others, they will be better able to adopt irrigation practices designed to increase their own productive output whilst minimising their impact on the environment.

## 2. Identification and description of the main problem related to the topic

The way that water is managed in a local catchment varies widely depending on local need, climate, culture and history (amongst other variables).

At its worst, water management is messy. Different actors (politicians, different administrators, farmers, water and energy companies and environmentalists) operate in their own silos. Water rights enjoyed by different actors vary (sometimes unfairly) and/or are poorly understood, and not adequately implemented (e.g. lack of metering, lack of protection against illegal water users, missing water quality concepts, uncertain reliability during droughts). This can result in a disconnected and opaque system for managing water that fails to fully deliver for business or the environment. Furthermore, it can be expected that climate change will lead to more extreme weather events across the EU (in terms of more frequent and more extreme drought and flood events) in future, which then will worsen the situation.

In this paper it is proposed that co-operative water management offers some solutions to this problem.

By reducing unit costs or by developing partnerships which bring them other benefits either vertically (up or down the supply chain) or horizontally (through groups of farmers), co-operation can help to encourage the uptake of water management technology by farmers.

Co-operation can take many forms, including:

- Sharing water resources physically (such as shared reservoirs) or legally (shared abstraction rights)
- Working together to develop more efficient and sustainable water use along supply chains
- Investing in advice, technology or systems to manage water efficiently and sustainably
- Benchmarking, training and knowledge transfer programmes
- Schemes to re-use (treated) waste water from other sectors or farms (aquaponics), moving towards a 'circular economy'

The advantages of co-operation are clear and, in some catchments, can be considerable. By working together with others farmers can improve their own management of water (more 'crop per drop'), improve their

<sup>1</sup> <http://waterriskfilter.panda.org/en/Mitigation#en/Mitigation/Agriculture/Stakeholders>

<sup>2</sup> <http://www.allianceforwaterstewardship.org/>

prospects for obtaining a fair allocation of water for their business, and increase the security of their access to water (which is especially important during dry and drought conditions when availability is limited).

### 3. Description of the existing best practices and possible solutions to solve the problem

#### Collaborative water storage

On-farm water storage is increasingly common in some catchments where seasonally high flow water can be captured, stored and used during the irrigation season at times of lower flows.

Reservoirs build water security into the business, but individual projects at the farm scale can be disproportionately expensive, time consuming and administratively complex.

Collaborative reservoir schemes where groups of farms share water are becoming increasingly popular, and can attract EU Rural Development Programme support<sup>3 4</sup>.

#### Collaborative water use

Models for water resource management vary across the world. The Delano-Earlimart irrigation project<sup>5</sup> operates in an arid area of intensive horticultural production. It is designed to manage water supply and to encourage uptake of water efficiency technology and systems.

#### The multi-sector approach

Sometimes farmers are brought into the management regime as an important stakeholder. The Water Resources East Anglia (WREA)<sup>6</sup> project is an example of a public supply company seeking to work with farmers to plan long term water sharing, efficiency and allocation.

#### Water re-use<sup>7</sup>

In West Flanders several suppliers of treated waste water, together with research institutes, are examining if it's possible to re-use this water as irrigation water. For example, Ardo (a frozen vegetable company) wants its treated waste water to be re-used as irrigation water.

The agricultural auction market of Roeselare (Reo-Roeselare) wants to re-use the waste water from the washing terminal of the EPS crates as water supply for the greenhouse that will be built on top of the roof of the washing terminal.

Waste water out of aquaculture is tested to be used as water supply for horticulture (tomatoes) (aquaponics).

#### Shared abstraction licences and regulatory constraints on abstraction

In some catchments, farmers face regulatory control on their ability to abstract water during periods of low river flow and scarcity. This can be damaging to production if restrictions on the ability to abstract water are imposed when the crop is mature (and significant inputs have been applied but prior to harvest). Some farmers have worked in partnership with each other and the regulator to reach agreement on 'voluntary restrictions'<sup>8</sup> earlier in the irrigation season. The aim is for farmers to voluntarily use less water than they are entitled to use over the whole season; and in return the regulator seeks to avoid imposing a total ban on irrigation.

In some catchments, farmers share a collective right to water rather than have individual permissions. This offers greater flexibility but reduces control.

#### Abstractor groups

<sup>3</sup> <http://www.holkham.co.uk/farming-shooting-conservation/reservoirs-irrigation>

<sup>4</sup> <http://www.russellsmithfarms.co.uk/>

<sup>5</sup> <http://www.deid.org/>

<sup>6</sup> Anglian Water Group Plc (2015), Water Resources East Anglia

<sup>7</sup> <http://ec.europa.eu/environment/water/reuse.htm> includes updated pan-European information on water reuse

<sup>8</sup> <http://www.nfuonline.com/prospects-for-spray-irrigation-march-2015/>

Groups of farmers with common interest in terms of soil and crop type can benefit by working more closely together, and so abstractor groups have been formed in some catchments. Abstractor groups such as the Broadland Agricultural Water Abstractor Group<sup>9</sup> help to spread information and knowledge about irrigation best practice, and promote the essential need of water availability for food production.

#### Partnerships between farmers and the food supply chain

Pepsico's '50 in 5' programme aims to reduce the water footprint and carbon emissions of its food chain by 50% in 5 years<sup>10</sup>. It has been working with its supplying farmers to meet targets by providing them with technical advice, training and support on water management on farm.

Coca Cola's Replenishment campaign<sup>11</sup> aims to return to communities and nature an amount of water equal to what is used in beverages and their production. Together with WWF Spain, 'Misión Posible'<sup>12</sup> supports farmers in the water scarce La Mancha area for collective water use planning and efficiency, complying with the water resource restrictions.

The Food and Drink Federation's 'Federation House Commitment' achieved a 5.6% reduction in water use in its first year (2010), despite production increasing by 4.2%<sup>13</sup>. A report suggests producers representing 10% of UK food production has reduced water per tonne of product by over 26% in 7 years<sup>14</sup>. Food companies will continue to put pressure on farmers to improve performance.

#### The Catchment Based Approach to water governance

The Catchment Based Approach<sup>15</sup> (CaBA) in the UK involves collaborative working at a river catchment scale to deliver improvements to our water environments. Partnerships, bringing local knowledge and expertise, are active in each of the 100-plus catchments.

## 4. Research gaps and practical solutions

Areas which need additional research to help manage water for farmers are:

- Cost models – how can co-operation reduce capital and operational costs and reduce risks?
- Management structures – what are the legal and financial structures to give farmers the confidence to invest in collaborative water management projects?
- Adaptive legislation – for example, Flemish legislation did not foresee the potential for re-use of treated waste water as a water source for agriculture. The discussion is on-going and is very hard.

## 5. Priorities for innovative actions

For sustainable water management to be a top priority for farmers, it will be important to develop the right technology, at the right price, linked to incentives and regulatory frameworks which encourage uptake on farm.

## 6. Suggesting potential practical operational groups or other project formats to test solutions and opportunities

EIP operational groups could address topics including:

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<sup>9</sup> <http://www.bawag.co.uk/>

<sup>10</sup> Pepsico (2014), <http://www.pepsico.co.uk/purpose/environmental-sustainability/agriculture>

<sup>11</sup> <http://www.coca-colacompany.com/stories/collaborating-to-replenish-the-water-we-use/>

<sup>12</sup> [http://www.wwf.es/colabora/que\\_puede\\_hacer\\_tu\\_empresa/patrocinio\\_y\\_donacion/grandes\\_campanas/coca\\_colas/](http://www.wwf.es/colabora/que_puede_hacer_tu_empresa/patrocinio_y_donacion/grandes_campanas/coca_colas/)

<sup>13</sup> Waste and Resources Action Programme (WRAP) and Food and Drink Federation (FDF), (2010), The Federation House Commitment Progress Report 2010

<sup>14</sup> FDF (2015), FDF Fivefold Environmental Ambition – Water: Progress to 2014

<sup>15</sup> <http://www.catchmentbasedapproach.org/>

- Models for shared reservoir infrastructure (where sustainable). What is the optimal area? One large reservoir or a network of smaller reservoirs? What technical and legal/contractual relationships need to be in place to share water?
- Regulation. How do we adopt more flexible abstraction licensing which responds to water availability? Can this be automated? Should currently un-metered supply in some catchments be regulated, and if so how?
- Water quality. How can we avoid or minimise contamination problems (ground water and surface water) in collaborative systems, for example, the re-use of treated waste water<sup>16</sup>

## 7. Ways to disseminate experience and practical knowledge

There must be focus on producing good case studies to demonstrate ‘what success looks like’ and helping groups of farmers or supply chain partners to work together on collaborative water efficiency projects.

Potential actors who can deliver facilitation include:

- Farming organisations such as trade bodies, co-operatives, public and private advisory services
- Food supply chain partnerships
- CAP Rural Development Programme skills and knowledge exchange/transfer
- EIP Operational Groups to support applied research led by small groups of farmers and industry

### How can we encourage farmers to adopt new technology?

The uptake of technology depends on much more than its availability. Farmers must buy into a business case<sup>17</sup>; it has to be profitable for farmers to adopt and it must be consistent with the cultural, economic, regulatory and social systems in which they operate.

Water is only one part of the decision-making process on farms and farmers may have many different investment opportunities to choose from – acquire more land and/or machinery, erect new buildings. New products and services, and the adoption of new technology for water management will have to successfully compete with these other options.

## 8. References already published research

### Strategic guidance from agricultural research bodies

The UK’s Agricultural and Horticultural Development Board (AHDB) environmental roadmaps<sup>18</sup> include a strong focus on water management and are guiding collaborative applied R&D.

### Strategic water storage and farmer support

The EDIA project<sup>19</sup> in Alqueva, Portugal fosters agricultural and agro-industrial development, made possible by investment in a major water storage facility.

EDIA has assisted the implementation and development of agricultural and agro-industrial projects by supporting experimentation, contacts with beneficiaries and other entities in the field, publicising projects and using and institutional framework tools. EDIA also offers decision-making systems, such as SISAP – the crop

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<sup>16</sup> At the time of writing, DG ENV is currently working on EU Guidance for Re-use of wastewater, mainly targeted to agriculture

<sup>17</sup> <http://waterriskfilter.panda.org/>

<sup>18</sup> AHDB (2014), <http://www.ahdb.org.uk/projects/GreenhouseGasActionPlan.aspx>

<sup>19</sup> <http://www.edia.pt/en/>

suitability support system, which assesses the suitability of a soil for a certain crop and is developing a model for technical and economic monitoring and management of the hydro-agricultural component at Alqueva

#### Reservoir construction

The UK Irrigation Association (UKIA) has produced a guidance booklet to help farmers<sup>20</sup>

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<sup>20</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/297089/gemi0408bnzp-e-e.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297089/gemi0408bnzp-e-e.pdf)