



Assessing opportunities for secondary markets for water in response to proposed abstraction reforms

Key findings

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Key messages

- The water abstraction plan led by the Environment Agency (EA) offers the opportunity to try **innovative ways of managing water**. The **Initial Priority Catchments** could represent a good opportunity to test some innovative water management approaches, including secondary markets for water.
- Some of the proposed changes in the abstraction licensing system still need to be further developed to be able to assess the **implications for water users**. This report studies how more sophisticated water trading, such as **secondary market products** (option, future and forward contracts for example), could potentially offer greater flexibility and risk-reduction **benefits** to agriculture in the context of the abstraction reform.
- There are also numerous **weaknesses and threats** that would need to be considered as part of the reform in relation to water trading. For instance, the implications for hands off flow (HoFs) conditions and Section 57 restrictions for pre-approved trades need to be carefully assessed. Market rules should be designed with caution to make sure all identified weaknesses and threats are mitigated.
- For a water market to work successfully (either primary or secondary), with easier and quicker trading, there is a need for more resources in terms of **staff, information and IT systems** to ensure water trading can take place within realistic business and crop production time-scales. Enabling **approval in advance** through secondary markets will overcome the main shortcoming of the current system (i.e. the long time period required to obtain approval from the EA).
- There is a general lack of **understanding and information** about water trading in the agricultural sector, with farmers not knowing what measures can and cannot be permitted within the current regulation or under the expected changes of the new abstraction system. **More consistency** in the way the EA staff manages water trading applications is recommended.
- The **agricultural drought during 2018** resulted in a situation where groundwater and river flows remained 'normal' through the irrigation season but licence holders began to run out of water because they had exceeded (or were in danger of exceeding) their annual licensed volumes. '**Licence flexibility**' permitted by the EA allowed rapid decisions to be taken on applications for short term and emergency trades which proved highly valuable in terms of reducing crop yield and quality losses. Within the context of the 2018 drought, it will therefore be important to capture lessons learned from the process of emergency drought trading.

Context

Since the publication of Government's Water White Paper 'Water for Life' (Defra, 2011), Defra and the Environment Agency (EA) have been working together on the design of a new water abstraction licensing system for England within the broader 25 Year Environmental Plan (HM Government, 2018).

A core element of the proposed water abstraction reform (Defra, 2016a) is the encouragement of water trading. Water trading can potentially provide growers (and other water users) with more flexibility and improved access to extra water, but it could also pose risks to the farming sector. Defra's report 'The impacts of Water Abstraction Reform' (2014) stated that "effective secondary markets should increase the benefits of water trading". However, there is widespread uncertainty on a range of issues including:

- How this type of specialist trading might operate;
- What the relative strengths and weaknesses might be compared to the current water trading mechanisms, and;
- How secondary markets might fit within the abstraction reform.

This report addresses these important gaps in understanding, and provides new insights into the advantages and limitations of implementing secondary markets for water in England, from the agricultural sector perspective.

Engagement with farmers and growers

The authors have been keen to engage with farmers as practitioners and licence holders from the start of this process. To help to develop and test our ideas, Cranfield University and the National Farmers Union (NFU) organised a workshop in February 2018 which was attended by 10 growers. The workshop included discussions surrounding the perceived strengths, weaknesses, opportunities and threats that secondary markets for water (and associated forward, options and futures contracts) might bring to the agricultural sector.

This report summarises the main issues emerging from that workshop and provides some key messages on how secondary markets for water could increase the flexibility of the current water trading system, identifies some of the negative externalities, and suggests ways in which the benefits of water trading can be promoted to the agricultural sector.

Key concepts

To date, water trading in England has been delivered through 'primary' markets – the permanent or temporary transfer of water from one user to another. Secondary market products for water, such as forward, future and option contracts, offer more flexibility to the market and greater potential for risk reduction amongst trading partners in comparison with traditional trading systems, lowering the risks of supply and price uncertainty for both buyers and sellers of water (Ranjan, 2010).

International experience of the use of secondary markets for water (e.g., the USA (Tomkins and Weber, 2010)) has shown that they can reduce risk management costs, enable water users to better match water access to their requirements, and encourage more efficient utilisation of water rights. Secondary markets have also proven successful in other resource sectors such as energy (ACIL Tasman, 2003).

Types of secondary market products

- **Forward and futures contracts** represent an agreement to buy/sell a certain volume of water in the future for a specified price. The difference between the two is that future contracts are standardised whereas in the case of forward contracts, parties can privately negotiate the terms of the contract.
- **Option contracts** give the holder the right (but not the obligation) to buy or sell a water volume on a given date for a given price, allowing the holder to delay water purchase decisions until more information is available (Kasprzyk et al, 2009), and offer protection against price volatility (Cui and Schreider, 2009).

One of the main benefits of secondary markets in comparison with traditional trading systems, in addition to reducing price and supply uncertainty, is that the agreement between the buyer and seller is made significantly in advance of the exchange (e.g., at the beginning of the irrigation season. See Figure 1). In England, pre-approval would solve one of the main limitations of the current water trading system – the time water users have to wait in order to obtain approval from the EA when they are in a difficult situation due to the lack of water.

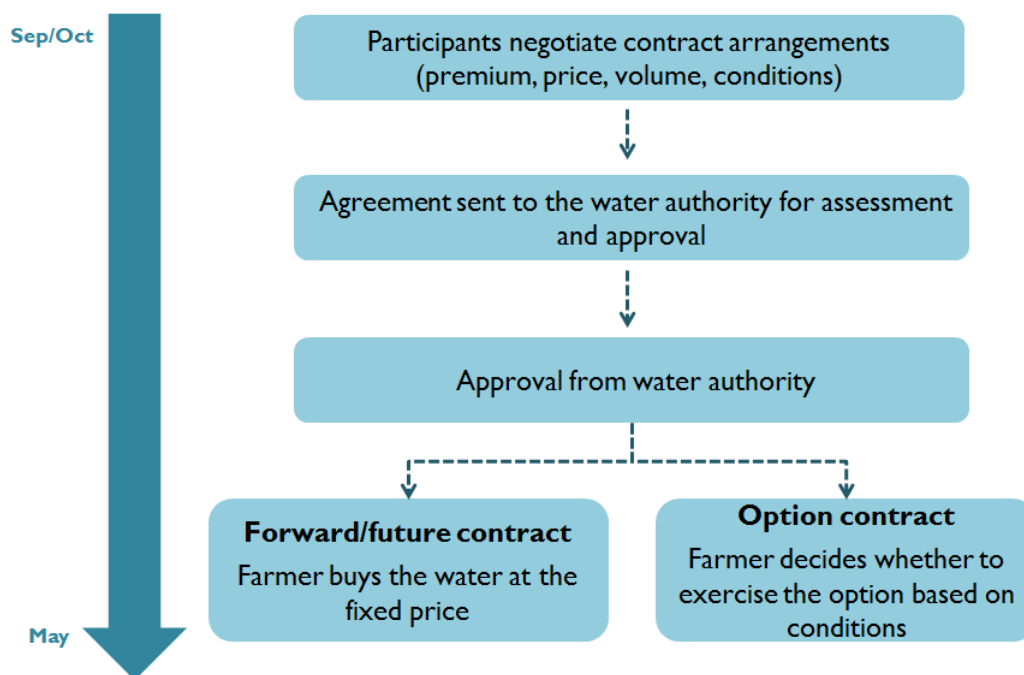


Figure 1. Theoretical representation of trading steps and typical timings based on forward/future contracts and an option contract for water.

Water abstraction reform and water trading

Defra has been designing the legislation needed to reform the water abstraction system in England (similar provisions are being developed in Wales). Consequently, the EA intends to implement the proposed changes through the water abstraction plan¹. The aim is to improve user access to water, particularly where abstractors are subject to restrictions, while protecting the environment. The reform addresses three main issues (Table 1).

Table 1. Overview of how abstraction reform will address current issues (Defra, 2017).

Current issue	Approach to address the issue
Some older licences allow abstraction that can damage the environment	Address unsustainable abstraction to get 90% of surface water bodies and 77% of groundwater bodies to the required standards
Current approach is not flexible enough to cope with the pressures of increasing demand for water and climate change in the long term, or to allow abstractors access to additional water when it is available	Stronger catchment focus approach to develop local solutions (e.g., changing licences to better reflect water availability; more flexible conditions that support water storage, water trading, and efficiency).
Abstraction service is outdated and paper-based	Modernise the abstraction services through a digital/online system

In addition to briefly describing these three core issues, this section presents their main implications regarding water trading.

Addressing unsustainable abstraction

The EA will amend those abstraction licences that are shown to be causing environmental damage and ensure that increasing water use by current licence holders does not increase the pressure on water bodies. It is intended that the EA will review more than half of the time-limited licences, revoke around 600 unused licences, work with abstractors to reduce under-used licences and regulate historically exempt abstractions¹.

Furthermore, the EA plans to move abstraction licences into the Environmental Permitting Regulations (EPRs) regime. At the time of writing this report, it was still unclear how the transfer of licences to permits in the EPR would affect the ability to trade water, but it is assumed that the potential for trading will remain unchanged.

Developing a stronger catchment focus

The EA will work collaboratively with abstractors at the catchment scale to find the right solution for each individual catchment. The outcome will be updated abstraction licensing strategies that

¹ Environment Agency's Water abstraction plan 2017: <https://www.gov.uk/government/publications/water-abstraction-plan-2017>

detail the solutions to be implemented in a particular catchment, such as those detailed in the abstraction reform consultation response (Defra, 2016b), including:

- Supporting rapid water trading;
- Sharing real-time information on river flow and forecast changes, and;
- Managing water discharges to benefit downstream users.

The EA will be working in four Initial Priority Catchments (IPCs: Idle & Thorne, South Forty Foot, East Suffolk, Cam & Ely Ouse) selected because of the existence of an unmet demand for water, where there is potential for water to be shared among users and where new and innovative ways of managing water can be tested (EA, 2018).

IPCs will be used to identify good practice that can be rolled-out to other catchments across the country, with a focus on helping to unlock access to the water that growers need. One of the approaches that will be tested is whether there is a way to improve and speed up the existing trading process. The outcomes of this process will help to determine how the licensing system can be modernised so that it continues to protect the environment whilst providing commercial operators with the confidence to capitalise on trading opportunities.

Modernising the abstraction service

A new IT system for abstractors is currently being developed by the EA. Licence holders will be able to see and amend their licence information online with a view to facilitating the dynamic management of all licences in a water body through, for example, management of hands off flow (HoF) conditions and trading. Users will only have access to their own data and will not be able to view others. Whilst individual licensing conditions will remain confidential, conversion to a digital format could facilitate trading assuming that other services (for example, mapping services that pinpoint the site, time and available volumes of water) are developed at the same time.

Implications for water trading

The EA acknowledges that very little trading of licensed water has occurred in recent years, primarily because:

1. Trading rules are not clear;
2. The mismatch between the lengthy administrative process on the one hand, and the immediate and short term needs of users on the other hand, and;
3. Lack of transparency and understanding of the system.

As a consequence, many farmers have adopted an alternative approach which involves renting or leasing land with an abstraction licence for irrigation, rather than trading water.

There is likely to be interest in trading opportunities amongst holders of large unused or under-utilised licences in hotspot catchments where there is unmet latent demand, or where summer availability or flows are unreliable. However, in practice the EA only permits the trading of water that is being actually used, meaning that trading of unused licenses is not permitted.

As part of abstraction reform, Defra have proposed the following process in relation to water trading:

1. The EA to develop pre-approval rules (volume, participants, duration) for each catchment;
2. Standardisation and publication of HOFs so that potential buyers can clearly see the reliability of water that is being offered for trade;
3. Price to be agreed between two parties;
4. Online system of water trading application and operation;
5. Brokers to facilitate trading, and;
6. The development of secondary markets such as forward contracts and futures.

Growers' views on abstraction reform and the potential of secondary water trading

Figure 2 (below) summarises the main issues identified by workshop participants in terms of strengths, weaknesses, opportunities and threats (SWOT) relating to the implementation of secondary markets in England.

One group discussed the strengths and weaknesses (from the farmer/farm business perspective), while the other focused on the opportunities and threats (positive and negative aspects from the perspective of the whole sector or catchment). Interestingly, although both groups worked independently, the main issues of concern were similar. Arrows represent the links between two issues. For instance, one of the strengths of having a more sophisticated water trading system is that growers will potentially have greater security of water supply. However, this could have a negative effect in that it could cause an over-supply of production of certain crops (weakness).

The topics shown in Figure 2 can be grouped in three main categories, namely those that:

- 1) Express concerns about agriculture losing control over its share of currently licensed water;
- 2) Relate to trading causing an increase in water use, potentially leading to environmental damage and/or increased likelihood of restrictions, and;
- 3) Relate to the implications for crop/food production.

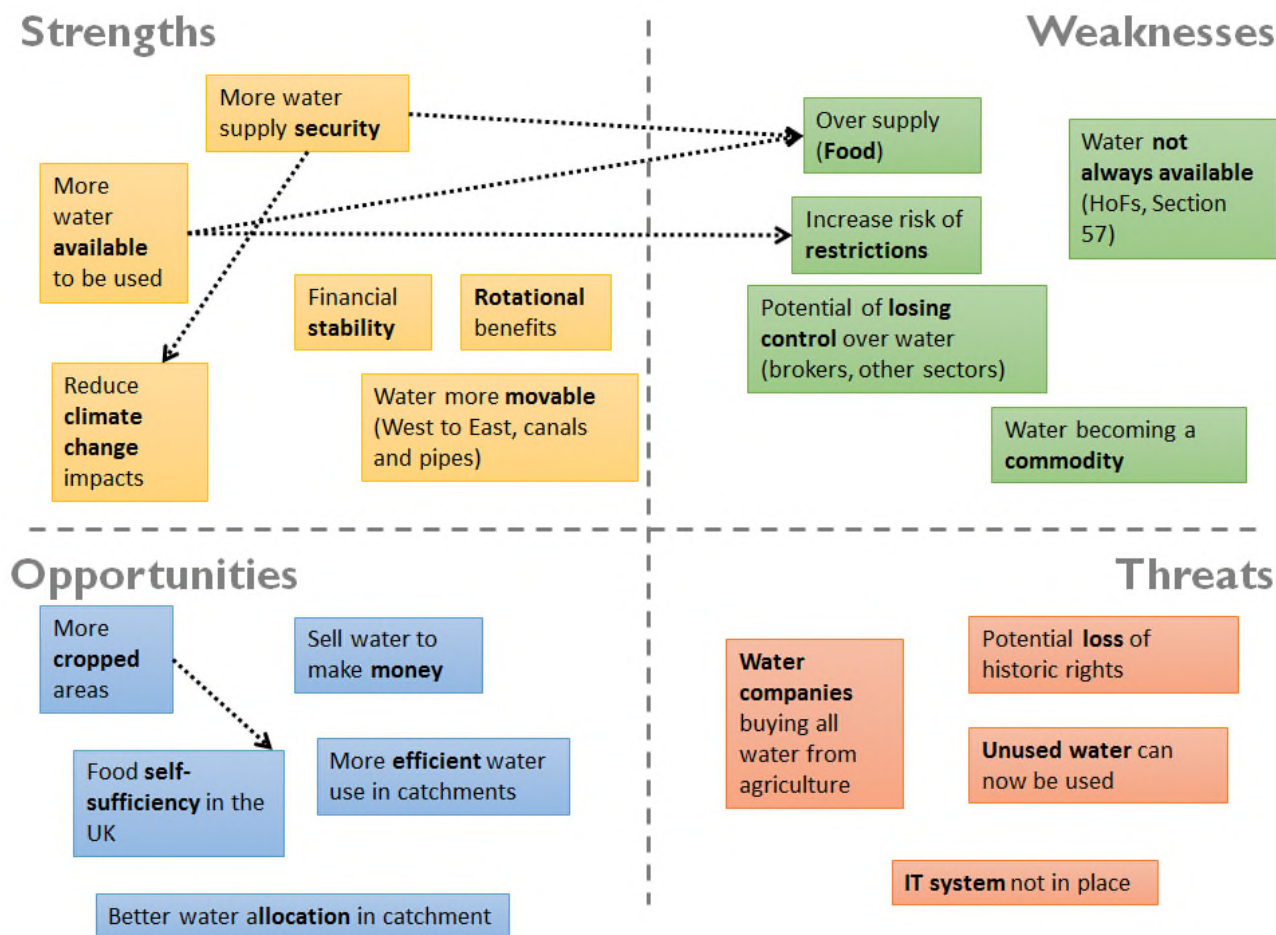


Figure 2. Synthesis of the SWOT analysis results

The participating growers recognised the value in having a more flexible and rapid water trading system that will potentially provide better access to additional water when they need it. However, they also raised concerns regarding the potentially negative consequences of implementing secondary markets for water - for example, easier trading could lead to water companies and water-intensive industries buying water from the agricultural sector year after year. A potential solution to this issue, as implemented in Australia, is to establish an annual limit or ‘cap’ to the amount of water that can be traded from agriculture into other sectors.

One advantage of secondary markets in comparison with traditional water trading systems is that users will obtain approval from the EA well in advance of the timing of demand. This would overcome one of the main problems with the current trading system – the long time period required to get approval from the EA when water users are in a difficult situation. However, if pre-arranged trades were implemented, then there is concern about what would happen if two parties reached a trading agreement but then no water was actually available when needed. Growers also expressed concerns around licence volumes being reduced as part of the ongoing ‘Restoring Sustainable Abstraction (RSA)’ programme being delivered alongside the abstraction reform and the transformation of licenses into Environmental Permitting Regulations (EPR). The characteristics of the new permits and reduction in headroom could limit the potential for trading water among users.

Information availability and transparency is crucial for water markets to succeed. The proposed new online system for abstractors could provide that information, although due to confidentiality

constraints its access and usability might be limited. One workshop participant highlighted that today farmers have all the information they need about who has water in their catchment as growers talk to each other.

Consistency across EA offices and staff members is also important to increase the trust and transparency in a water trading system. Some workshop participants stated that rapid approval from the EA for trading water is essential, but they worried that the level of service would vary at different area offices.. Farmers are prepared to wait a few weeks to seek EA approval regarding their trading agreement, but no longer. During the 2012 drought, some farmers obtained approval in just two weeks, which demonstrates that the EA has the ability to process transactions in a reasonable amount of time.

‘Licence flexibility’ during the 2018 agricultural drought

As the 2018 agricultural drought intensified, the EA issued a statement (31 July) setting out how it would offer flexibility in the abstraction licensing system designed to help farmers in an emergency and on a short-term basis. The EA position statement followed calls from the farming community for urgent government assistance, primarily to allow farmers to trade water during the emergency.

The main change in the EA’s approach was in its commitment to rapid decision-making on short term abstractions. The EA instructed its local area offices to consider applications for short-term licensing flexibility for the remainder of the 2018 irrigation season, including the fast-track trading of groundwater without the need for all of the important but time consuming permitting checks through the abstraction licensing system.

The EA stressed that no ‘blanket’ exemptions would be available and under no circumstances could abstractors operate outside the terms of their existing abstraction licence(s) without prior approval.

Fast-track, short-term trades of water between willing donors and recipients (sellers/buyers) were considered by EA area offices on a case by case basis. Viable trades were only considered when from the same groundwater/surface water source and within the same water body (hydraulically linked). Water volumes permitted for trading were based on calculations of historic use with determination of volumes based on local circumstances.

In practice, the EAs abstraction licence flexing position during the agricultural drought focused on an approach of relaxing ‘red tape’ rather than relaxing environmental standards. Farmers wishing to trade water with another licence holder was permitted to do so where the two abstractions were hydrologically connected. Flexing arrangements highlighted that requested trades are likely to be complex and often need more detailed assessment. By late September 2018, the EAs approach to flexing abstraction conditions resulted in 131 requests received from growers in England (mainly but not wholly for water trades) of which 88 were approved and 32 were refused (with 11 applications outstanding and still under consideration).

It is not within the scope of this report to evaluate the success of the emergency trading procedures during summer 2018, but the agricultural drought event will certainly provide important lessons to be carried into the abstraction reform 'priority catchment' process.

NFU Water Bank

During the 2018 agricultural drought, one key component to successful trading was the matching of potential trading partners. To meet demand for information on possible trading partners, the NFU created a 'match-making service' called the NFU Water Bank. It was designed on the premise that ideally, potential donors and recipients should match up with each other before seeking EA approval of the trade. The NFU Water Bank is a web-based spreadsheet that provides licence information that is contained on the public register, thereby avoiding any potential issues surrounding confidentiality of information.

Through the Water Bank, the NFU supported the information needs of members by managing a web-based 'notice board' where potential donors and recipients posted their water needs and availability in the expectation that they could be matched.

Concluding remarks

This report highlights the benefits that secondary markets for water can offer to growers in England. Also, it emphasises the issues that would need to be addressed as part of the ongoing abstraction reform if the government would like to implement this type of trading mechanism. The identified issues by our workshop participants, although developed in the context of secondary water markets, are also applicable to any kind of water trading that will increase their flexibility to participate in the market.

In that case, further conversations between the EA and farmers will be required to better understand the implications for growers, other water users and the environment.

The drought and heatwave conditions experienced during 2018 clearly highlighted the benefits of providing greater flexibility for water users during times of low water availability. The performance of the NFU Water Bank will be evaluated as an important 'lessons learned' towards successful trading in the longer term.

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