

PROPERTY RIGHTS AND THE ENVIRONMENT: 6-8 JULY 1998

LANDOWNERS AS STEWARDS OF WATER RESOURCES

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Summary

This paper illustrates the role of landowners as stewards of water resources by focusing on the conflicts which surround the irrigation of farmland in England. It summarises the economic and environmental impacts of irrigation and stresses the central role of irrigators in sustainable development: seeking to satisfy the public demand for high-quality food on the one hand, and the public demand for a high-quality environment on the other. The paper reviews the four main policy mechanisms available to influence the behaviour of irrigators and gives examples of how information and advice, voluntary agreements and market-based instruments can play an important role alongside regulation. The paper recommends that policy-makers would do well to consider the alternatives to regulation when trying to influence the behaviour of private businesses.

Introduction

1. The Country Landowners' Association represents 50,000 landowners in England and Wales who between them own some 5 million hectares of land. Our members are involved in a diverse range of business activities in rural areas: agriculture, forestry, fisheries, tourism, recreation, and other rural industries. They lie at the heart of the rural economy, rural society and - not least - the rural environment.
2. Water resources and water quality are important concerns for our members, and are, in turn, influenced by their land management activities. Our members have a considerable interest in water resources - as farmers in general, as spray irrigators in particular, as foresters, as fishery managers and often as anglers, as users of public water supplies, as operators of private water supplies, and not least, for conservation and amenity reasons.
3. My theme is "Landowners as Stewards of Water Resources". I propose to illustrate that theme by focusing on the conflicts which surround irrigation in England. I hope to illustrate the role of landowners as stewards in sustainable development: seeking to satisfy the public demand for high-quality food on the one hand, and the public demand for a high-quality environment on the other. I also want to review some of the policy mechanisms - other than regulation - which are being used in England to try to help landowners reconcile these two aims.

Irrigation in England

4. I should say something about the management of water resources in England before I begin. The abstraction of water is heavily regulated in the UK. In particular, an "abstraction licence" is required for all water abstracted for spray irrigation - as well as for water used for many other purposes. Licences are needed for water abstracted from rivers and also from below the ground. The licences are granted by the Environment Agency, which has to manage water to safeguard the

environment while meeting the legitimate needs of public water supply, industry, agriculture and power generation. Abstractors pay an annual charge to cover the administrative costs of managing the licensing system.

5. In terms of land use, irrigation is a minor user of water in the UK. About 150,000 hectares of farmland are irrigated - 1.1% of UK farmland. This is very small in comparison with other EU member States. Spain and Italy each have more than 3 million hectares of irrigated land, and Greece and France each have more than 1 million hectares. The UK has only 1.5% of the total irrigated area in the EU.
6. Irrigation in the UK accounts for less than 1% of licensed water abstraction. It is a minor user of water. The total annual irrigation volume of 160,000 megalitres of water is concentrated mainly on potatoes, field vegetables and sugar beet. Recent surveys show that irrigation is increasingly focused on the more valuable crops and also that more water is being applied to those crops that are irrigated.
7. The latest predictions of irrigation demand up to 2021 suggest possible increases of 14% to 24% in the area irrigated, and of about 50% in the volume applied. These predictions ignore climate change - and it should be stressed that of course it may not actually be possible to meet these demands - neither the land nor the water may be available.

The economic value of irrigation

8. Irrigated agriculture may not be a significant activity in terms of the overall use of land and water, but it is certainly important to those whose businesses partly or wholly depend on it - in farming, food processing and ancillary industries:

irrigation increases the options for the use of land available to farmers: it opens up the possibility of arable production for many farmers who would otherwise be limited to livestock.

irrigation increases the choice of crops on arable land: the value-added attributable to irrigated potatoes compared to wheat fed by rain is about £1,000 per megalitre.

irrigation raises yields: for example, yield responses from 25 millimetres of irrigation are over 2 tonnes per hectare for maincrop potatoes and sugar beet

irrigation delivers consistent, high quality produce throughout the growing season: this is increasingly important for all crops as supermarket buyers set high standards and expect them to be met.

9. For many farmers aiming to meet the demands of supermarket contracts, irrigation is a necessity. If water is cut off part way through the growing season, so that crops cannot be finished, it may prove impossible to market them; all previous crop inputs, including irrigation up to that point, may be wasted. It is not surprising that major food buyers are increasingly telling farmers that they will not give them a contract unless they have reliable irrigation water supplies.
10. At the UK level there is a legitimate concern that, without irrigation, English farmers and growers would lose their markets to overseas competitors able to

deliver the same quantity and quality of produce. If irrigated farms fail this would have damaging consequences for local employment - given the relatively labour-intensive nature of many irrigated crops - and for the economy in general.

Irrigation and the environment

11. Several characteristics of irrigation mean that it has potentially substantial - and perhaps disproportionate - impacts on the water environment:

irrigation is a consumptive use: all of the irrigation water taken up by growing plants is lost to increased transpiration. Water may also evaporate in the air and from soil or leaf surfaces. The amount returned to the water cycle is generally less than 10% of the total applied.

demand is concentrated into a relatively short period, typically 8-12 weeks each year, when water flows tend to be at their lowest. Demand may, not surprisingly, be highest when hot and dry weather persists, further adding to stress on the water environment.

demand is concentrated geographically - in particular river basins, and particularly in the drier south-east of England.

demand varies greatly from year to year - in particular demand peaks in dry years - again just at the same time as water is most scarce.

Tackling conflicts

12. Existing conflicts between irrigators and the environment, given increased demand for irrigation, may worsen. Securing sustainable development in this case means integrating the public interest in securing high-quality food with the public interest in protecting the environment. The only people who can effectively integrate these two sets of concerns are private individuals - the farmers whose activities produce the food and may unduly affect the environment. Accordingly, policy-makers strive to influence the behaviour of these farmers.

13. Problems arise in deciding what is the best approach to take. Policy-makers have a choice of four sets of mechanisms:

information and advice can be used to improve awareness of the problems that farming can pose for the environment, and to encourage the widespread adoption of "best practice" to avoid or minimise these.

market-based instruments - incentives or charges - can be used to influence behaviour. The Common Agricultural Policy demonstrates the success of market-based instruments and provides a precedent for their wider use.

voluntary agreements can also be used to encourage action, for example, through river basin management plans based on a voluntary consensus.

regulation should always be viewed as a last resort, not a first resort, for action. It should always: follow sound science; be subject to cost/benefit analysis; be

geographically contained; and be monitored and reviewed regularly. Provided these requirements are met, regulation is appropriate to set minimum standards.

14. It is our perspective in the CLA that policy-makers too often prefer the last mechanism - regulation - over the others. It is important to remind policy-makers at EU and national level from time to time that action to tackle water-related issues in the EU takes place within the context of a market economy, not of a centrally-planned economy. Regulation - state interference in the operation of that market economy - should always be a last resort. Regulation should only be applied where the market fails to deliver public benefits and once alternative mechanisms have been fully tried and found to be ineffective.

15. In developing all the available mechanisms, in relation to irrigation, several points need to be borne in mind:

effective mechanisms will be those which benefit both farmers and the environment: favoured options will: lower costs or add no costs; reduce uncertainty; reduce risk; and save time in managing the business.

the economic value of water varies between farms and enterprises: the economic incentive to conserve water will therefore vary.

it is necessary not only to “act locally” but also to “think globally”: banning irrigation in the UK might bring local environmental benefits but lead to greater damage to the water environment elsewhere, as supermarkets seek alternative supplies.

economic impacts must not be ignored: banning irrigation might bring environmental benefits, but would also damage employment and related industries. Equally, no business should now invest without seeking to avoid or minimise environmental impacts.

greater efficiency of water use does not necessarily reduce impacts: for example, “scheduling” (relating irrigation closely to crop needs and rainfall) could lead to reduced or increased abstraction, or to the same volume of water being applied over an increased crop acreage.

Mechanisms

16. Against this background, I would like to review opportunities in three areas - other than regulation - for action to tackle conflicts over irrigation: providing information and advice; securing voluntary agreements to manage water; and using market-based instruments to encourage farmers to develop winter storage reservoirs.

Providing information and advice

17. Irrigators need more and better information in planning to meet future water needs and a good understanding of the likely availability of water in their river basin. At present it is often difficult to discover what abstraction licences exist in a river basin, what resources are reserved to meet the needs of the water environment, and what, if any resources are not yet committed.

18. Irrigators also need a better understanding of environmental needs and of how their own abstractions affect these. For example, low river flows, on their own, in conjunction with discharges, and especially in very hot weather, can cause acute damage to fisheries and other wildlife, and impede navigation. There also needs to be greater awareness of chronic effects of water abstraction, for example, on wetland habitats for wildlife.
19. The Ministry of Agriculture produces several useful booklets to assist farmers in planning and managing water resources for irrigation: “Good Irrigation Practice”, “Irrigation Scheduling”, “Winter Storage Reservoirs” and “Making the Most of Your Spray Irrigation Abstraction Licence”. A manual on “Best Irrigation Practice” has recently been commissioned.
20. Work is also underway to develop a “do-it-yourself” irrigation audit system. This would encourage farmers to review their current and future water needs in the context of the water resources available within the river basin and the needs of the environment and other abstractors. This would encourage better long-term planning and better short-term management of irrigation.
21. Provided that information and advice is up-to-date, relevant, and effectively promoted to those who can make good use of it, it can be very effective in changing the behaviour of farmers.

Voluntary agreements to manage water

22. Voluntary agreements are useful in limiting abstraction where resources are scarce. It may seem strange that an irrigator can benefit from agreeing to limit his abstraction rights voluntarily. However, if there is not enough water in a river for environmental needs, there is always a risk that irrigation would be banned completely by the Environment Agency. If this happened, a crop could be ruined, and all the inputs applied to it - fertilisers, pesticides and water - would have been entirely wasted. When water supplies are scarce, there can accordingly be clear benefits to an abstractor to agree to limit abstraction so that the available water is shared equitably between all abstractors and the environment in a particular river basin. Such voluntary agreements also help protect the water environment.
23. Voluntary agreements have been widely used in Eastern England, where much irrigation is concentrated. The first agreements were initiated after the drought of 1988-92, when there were widespread total bans - affecting 1,000 abstraction licences in 1990, 244 in 1991 and 80 in 1992. The friction which these caused between the Environment Agency and abstractors has led the Agency to support successful voluntary agreements among several groups of irrigators.
24. Important legislative incentives to seek voluntary agreements have also been provided by two new duties placed on the Environment Agency under the Environment Act 1995: a duty to take account of costs and benefits and exercising deciding whether or not to ban abstraction for spray irrigation; and a duty to “have regard to any effect which its action would have on the economic and social well-being of local communities in rural areas”.

Developing winter storage reservoirs

25. There has been considerable development of winter storage reservoirs by irrigators in recent years. These are small reservoirs constructed on the farm on which the water is used. They are filled from rivers or groundwater sources during the winter. The stored water is then used to irrigate crops in the summer - either as the sole source of water or to supplement water abstracted directly from rivers during the summer.
26. Between 1965 and 1995, the total number of winter storage reservoirs in England increased from 800 to 3,200, and their total volume from 5,000 megalitres to 64,000 megalitres. This largely reflects simply the increasing economic value of an assured water supply: it is a response to the market. However, there is also potential to encourage the further development of winter storage reservoirs through the use of market-based incentives.
27. Winter storage reservoirs have several advantages:
- providing a supply where summer abstraction would not be licensed** because of damage to the environment or other abstractors.
 - improving security and flexibility of supply:** abstractions from reservoirs cannot be banned overnight - this reduces uncertainty over the availability of water.
 - reducing abstraction costs:** the volume element of the annual charge for abstraction is 10 per cent of the rate for direct summer abstraction.
 - increasing capital value:** having a reservoir to guarantee supplies (provided that water is available in the winter to fill the reservoir) can provide a competitive advantage and accordingly add value to a farm.
 - aiding long-term planning:** abstraction licences for water abstraction in the winter are usually granted for longer periods (for example 20 years) than licences for direct abstraction, to reflect the time needed to recoup the capital investment involved.
28. These advantages provide sound business reasons why irrigators should invest in winter storage reservoirs. It could be argued that these incentives are adequate in themselves, and there is no need for Government intervention to interfere in the operation of the market here. However, there are significant public benefits associated with winter storage reservoirs. For example:
- by assuring the availability of water** - helping to assure food supply contracts and thus employment.
 - by reducing pressure on water resources** at times when they are under greatest stress - helping to avoid the problems associated with low flows and the desiccation of wetlands in hot summers
 - providing new wildlife habitats and landscape features** in arable farming areas.
29. One way in which a further economic incentive for the establishment of winter storage reservoirs could come from the current Government review of the water

abstraction licensing regime in England and Wales . At present, the unit charges for water abstracted in the summer are ten times those of water abstracted in the winter. Widening this differential could help to increase the value of winter storage reservoirs to farmers. This would provide an example of the use of a market-based incentive to influence behaviour in relation to water abstraction. Other market-based incentives could be to introduce financial grants towards the costs of constructing the reservoirs, or to reduce the tax charges on such works.

Conclusion

30. In conclusion, the three major points which I should like to draw from this presentation are:

firstly, that landowners who irrigate have a crucial role to play in responding to - and integrating - the twin public demands for high quality food and a high-quality environment. They are well-placed to meet these needs and should be encouraged to do so.

secondly, that a range of policy mechanisms can be used to encourage landowners to make decisions which are in the best interests of their businesses and of the environment. There is an important role for each of the four main policy mechanisms: providing information and advice, establishing voluntary agreements, using market-based incentives, and using regulation.

thirdly, that policy makers would do well to consider the alternatives to regulation when trying to influence the behaviour of private businesses. I suggest that the alternative mechanisms are often better mechanisms, and they should be used, in preference to regulation, wherever possible.