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East of England Rural Forum

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From: Jane Burch
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Related papers:

Water Resources

Issue

The East of England is the driest region in the country receiving only two thirds of the average UK annual rainfall. Many of the region's surface and ground waters are under severe pressure. Climate change will add to the pressure, altering both the pattern and the amount of rainfall.

The region has one of the fastest growing populations in the UK. It contains the London-Stansted-Cambridge growth area and significant parts of both the Milton Keynes/South Midlands and Thames Gateway growth areas. Further development in the region will put considerable additional pressure on water resources.

A number of surface and ground water sources in the region are at risk from saline intrusion due to failing sea defences and coastal erosion.

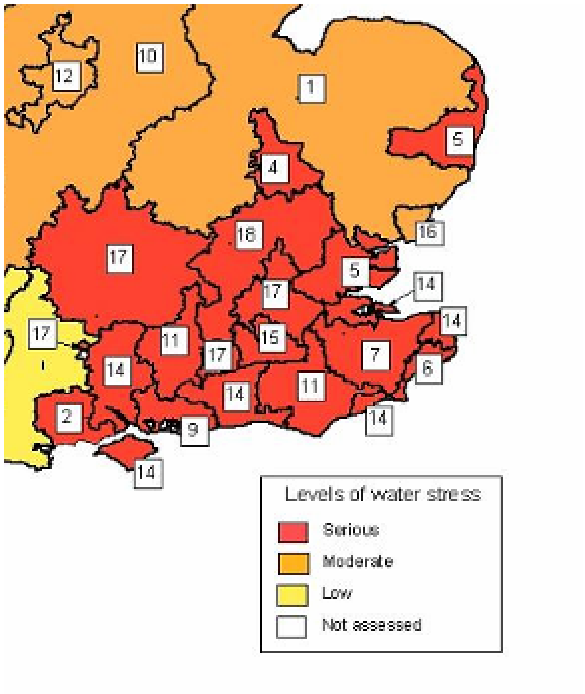
Water is vital not only for domestic supply but also for agriculture and other industries, maintaining the environment and for a range of recreational purposes and tourism. Whilst agriculture nationally only uses an average of 1% of all water, in this region agriculture utilises a higher percentage – usually around 5% - but this can rise on occasional days to over 60% of water being used for irrigation. This tends to coincide with the driest periods when overall demand from all users is at its highest. Over 1000 agri-businesses rely on irrigation to produce 30% of the UK's potatoes and 25% of all vegetables and fruit.

A high proportion of important wetland environments are situated in the Eastern Region, all dependent on sufficient and high quality river flows and groundwater levels. It is a requirement under the Habitats Regulations to revoke/amend abstraction licences that are having a detrimental effect on a designated habitat (SAC/SPA).

Background

Water availability and use

The East of England is the driest region in the country receiving only two thirds of the average UK annual rainfall, with parts of the region having less water per person than Sudan or Syria.



Water Stressed areas[1]

Further development in the region will put additional pressure on the amount of water available. The East of England Plan Sustainability Appraisal recognises the issue of water shortages: "pressure on both groundwater and surface water resources, with some areas already experiencing unsustainable abstraction…" It recognises that additional development will put a further strain on limited water resources. In most sub regions "lack of water resources" has been identified as a potential problem in delivering the required development "particularly in the southern areas where water availability is lowest and the housing allocation highest".

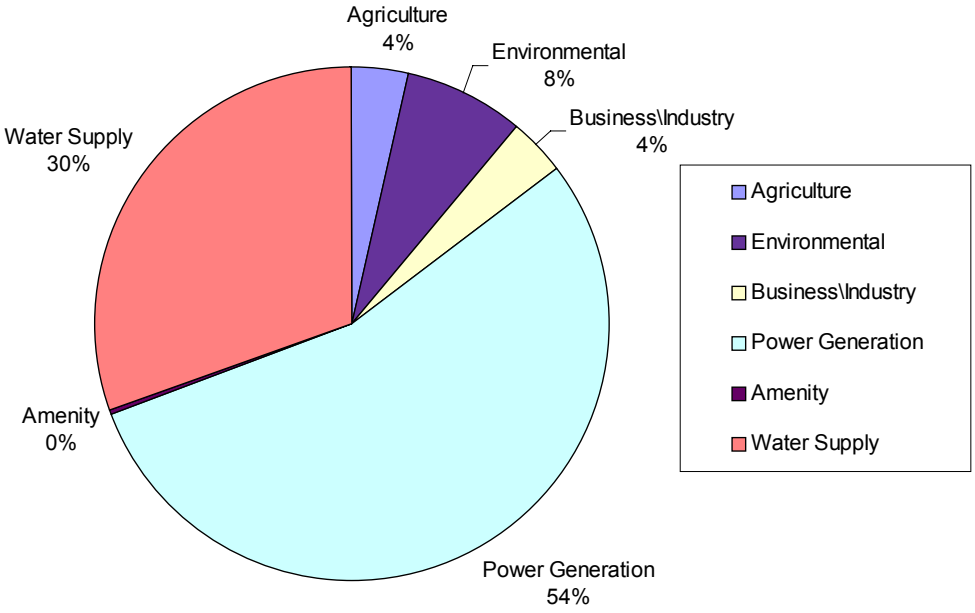
In common with many other regions, the rivers in East Anglia are used not only for domestic supply but also by farmers and other industries, maintaining the environment and for a range of recreational purposes and tourism. Many valuable habitats and fish populations are dependent on sufficient and high quality river flows and groundwater levels.

National water use (licensed) by sector[2]:-

Public water supply	44%
Electricity (non-consumptive)	30%
Industry	12%
Agriculture	2%
Fish farms	10%

The Anglian region[3] figures vary slightly from the national average:-

[1] Environment Agency Water Resources Strategy consultation 2007
[2] 2007 Environment Agency. These refer to licences granted not the actual amount used in the year, which generally equate to about 50-60% of the licensed capacity for all sectors.
[3] The Environment Agency Anglian Region includes most of the Government Eastern Region plus parts of Lincolnshire and Northamptonshire.



However, on a peak summer's day, more water is abstracted for agricultural irrigation than by all the water companies combined, with the demand concentrated in the driest years, in the driest catchments and when resources are most stressed. A number of farmers are shifting to using water stored on farm, rather than relying on abstraction at peak times to overcome this problem.

Water is an important requirement for many food and drink processing industries, many of which are located in the region and are important to employment and the economy of the region. 18%[4] of the region's industrial use of water is in the agri-food sector.

Abstracting water for public, industrial and agricultural uses can have negative effects on water resources for wildlife, navigation and amenity especially in times of shortage. The Environment Agency's legal powers, Catchment Abstraction Management Strategies and the abstraction licensing process seek to balance demands.

<u>The impact of Climate Change[5].</u>

By 2080, if we continue to discharge high amounts of greenhouse gases into the atmosphere, in the East of England it is predicted that:-

- temperatures will rise by 3-5^{o}C
- summer rainfall will fall by 45-60% compared to current patterns
- winter rainfall will increase by up to 30%

Whilst annual rainfall may not alter dramatically, the patterns and seasonality of rainfall may change, which in turn will have impacts on river flows, the environment

[4] Environment Agency figures (Sarah Fowler presentation to East of England Business Group, Oct 2007)
[5] UKCIP report.

and the availability and quality of water for abstraction. The increased rain which falls in winter must be captured to provide the resources we will need during longer, hotter, drier summers.

In addition the pattern of demand for water is likely to be affected – the hotter, drier summers leading to greater public demand (washing, watering gardens, swimming pools, etc) and a greater need for water to support agricultural production.

Water and Food Production

Agriculture, together with the associated food processing, distribution, retail and catering sectors provides 358,000 jobs and over £12.9 billion to the economy of the eastern region, much of which would be at risk if water supplies were limited. Over 1000 farms depend on irrigation to supply high quality fruit, vegetables, potatoes and salads. 30% of all potatoes and 25 % of all vegetables and fruit sold through the multiples comes from these irrigated farms.[6]

Nationally, irrigated agriculture accounts for 4% of crop area but 20% of crop value. Irrigation is essential for production of high value, continuous supplies of produce. A lack of irrigation not only affects yield, it also has serious negative impacts on product quality (e.g. scab in potatoes) and thus a double impact on economic viability. Without a secure water supply much of the region's most productive agriculture and food processing sector would be unviable.

Without water this crop production would be moved to other areas of the world, with an associated rise in carbon emissions.

Irrigated crop production is dependent upon a reliable water supply. This is needed to ensure a return on the high amount of working capital required and continued investment in new technology. This supply is coming under increasing threat in the near future, not least because of environmental pressure through the Habitat Regulations which gives protection to wetland habitats.

The agricultural sector is doing a great deal to utilise water as efficiently as possible – by forming abstractor groups and adopting technical measures to improve water use efficiency[7]. In addition many landowners are moving towards collecting and abstracting water during the winter months in reservoirs for use during the drier summer months. However, they are hampered by planning regulations, lack of financial support and a long and costly process of gaining consents from the Environment Agency[8].

Most on-farm reservoirs are above-ground, rectangular structures, with little environmental benefits (they can in some cases be regarded as detrimental to the landscape). This is because this is the cheapest way to build a reservoir, difficulties with the disposal of the 'waste' soil (so it gets used to build the walls), the regulatory burden surrounding reservoirs and easier management. However, it is possible to achieve a much more natural reservoir by digging out a pit/old mineral workings or similar and allowing appropriate vegetation to surround and inhabit the water edge, introduce fish, etc. One good example of this is the reservoir on Wantisden Farms –

[6] Jerry Knox, Cranfield University 2007
[7] EEDA/Cranfield University/NFU projects 2006/7
[8] Lynsey Craig, EA Anglian Region work on study of the barriers to reservoir construction

built some 25 years ago at the time of mineral extraction. The reservoir appears to be a series of 'natural' lakes with abundant flora and fauna – yet it supports the entire irrigation requirements of the estate and is topped up by winter abstraction. This example of both water storage, landscape and biodiversity enhancement could be achieved with better financial and regulatory support.

Global changes in crop production related to changing climate will make this region even more important for food production – both to feed this country and the wider world. The option to move agricultural production elsewhere where water supplies are more plentiful does not solve the problem. This can be illustrated by a study of the East Suffolk catchment area[9]: This area currently supports around 5500ha of vegetables, with irrigated crops producing over £10million for the local economy. For climatic and other reasons a large proportion of this production could not be substituted elsewhere in the UK, thus this food would have to be imported. The effect of so doing would be an extra 5000 tonnes of CO_2 emissions.

Also of importance in this region is a supply of good water for livestock and fish farming.

Public Water Supply

Water companies are responsible for over half of the water abstracted and consumed by domestic and industrial users. Whilst much has been done to improve water use efficiency – e.g. control of leakage from pipes (Anglian Water has the best record of any in this respect), installing water meters and public information campaigns on water saving, there is still much to be done. The problem lies in the costs involved. If water companies were to replace all the many leaking underground pipes and fit water meters to all existing homes it would add very considerably to the cost of domestic water.

The main thrust of water efficiency measures must therefore lie with the domestic consumer. Reducing mains water use in buildings can be broken down into three main approaches: water saving devices, good housekeeping and efficient appliances; alternative water supplies (for example rainwater use); and recycling and reuse of water (for example greywater use).

On average each person uses 150-180 litres of water per day[10], 25% of which is for toilet flushing and about one third for personal washing[11], much of which is wasted in the drainage system. Individual use is rising fast (30% since 1970) and will almost certainly rise still further if the climate becomes hotter and drier as predicted. Much can be done at a domestic level such as installing efficient devices (e.g. low-flush toilets) and using water efficient appliances, as well as educating the public about the true value of water. Water metering has been shown to result in about 10%[12] water savings and a greater awareness of water use and up to 16% can be saved through very simple domestic measures.

Even greater savings can be made in new developments by the installation of rainwater harvesting devices and use of rain/grey water – as per the Sustainable

[9] East Suffolk Water Abstractors Group report, September 2005
[10] *Blueprint for Water – 10 steps to sustainable water by 2015*
[11] Water Efficiency in Development. Report prepared for the E of England SDRT by Atkins.
[12] OfWat data

Homes Standard. However, most developers will not install such measures voluntarily due to the costs involved, which suggests regulation maybe the only way forward.

One possible solution could be to raise the price of water. This might make users recognise its true value and be less wasteful of this precious resource. This policy would, however, hit low income families hardest and is one that needs considerable debate and is not universally supported.

Water and the natural environment

The region has many habitats that are dependant on sufficient and good quality water – the Broads and the Fens being the most significant. Water levels and quality in designated sites (SACs/SPAs) is protected by the Habitats Regulations which prevent abstraction licences being issued if they would have an adverse impact on these protected habitats.

Ironically, whilst some areas are entirely natural, there are a number of SSSIs that have resulted from man's activity in relation to water management. Many occur within the drained and pumped areas under the control of the Internal Drainage Boards.

Climate change will undoubtedly impact on all habitats and wildlife to some extent. The future difficulty may lie in deciding which wetland habitats should be preserved at all costs – maybe at the expense of having sufficient water available for domestic or agricultural use – and which should be allowed to evolve into a different, maybe drier environment. However, the balance between nature and socio-economic needs will always be a delicate one and there will undoubtedly be some very challenging debate in the coming years.

Certain wetland environments (e.g. part of the Fens) could be extended as natural reservoirs (and as a way of sequestering carbon) to assist in ensuring continuity of supply, mitigate the effects of climate change and for flood alleviation. However, this needs careful and holistic consideration as it may involve taking agricultural land out of production coupled with an increased requirement for imported food. In addition, the issue of how to compensate the land manager for loss of economic activity will need to be addressed, either through enhanced environmental stewardship schemes, changes in the CAP or by direct payments for the purchase of land. Guaranteed security of abstraction for irrigation would be one incentive for landowners to participate in such schemes. This approach needs a co-ordinated approach between the Environment Agency, Natural England, EEDA, planning authorities and national government.

Water and Recreation

The Region's rivers and other waterways, in particular the Broads[13], are vitally important for recreation and tourism, big contributors to the economy of the region and of vital importance to the health and well-being of the population. Activities

[13] The Broads Authority suggests the value of tourism in The Broads was around £150million per annum (1998). EEDA figures value tourism across the region at about £5,000million per annum (2004).

include angling, boating and general enjoyment of the wildlife associated with wet habitats.

Recommendations and Options

Government works with the region to address the issue of limited water resources in the region, and thus ensure economic and environmental sustainability.

The areas in which the government can help the region:-

Enhancing Supplies

- In the long term there needs to be a general shift in water use from reliance on abstraction from rivers and groundwaters to using stored water. Therefore storage capacity needs to be increased across the region.

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- The Environment Agency Water Resources Strategy should focus on capturing and storing available water at times of peak flow, alongside demand management.

- We should change the regulatory and planning environment to integrate water resource, flood and coastal management planning processes to maximise benefits to the economy and environment.

- Available funding should be used to encourage the development of both natural and artificial reservoirs to capture rainfall and utilise water when plentiful. The planning and regulatory systems need to take a positive attitude towards the provision of reservoirs, both small and large.

- The Environment Agency should work with land managers to develop holistic funded solutions which integrate the provision of land for flood alleviation with water storage and greater security of abstraction rights.

- The Government should protect water supplies for agri-businesses, recognising the importance of UK-produced food as one element of the battle against climate change

Demand Management

- Encourage and support water abstractor groups (both cross-sector and within the agri-food sector) to spread best practise and the application of new efficiency measures.

- Promote and encourage water capture and efficiency measures in new housing, industrial and service developments and provide incentives for retro-fitting. Remove choice of domestic fittings/appliances which use high volumes of water.

- Support both water companies and others to control leakages through financial incentives and raising awareness.

What the region can do for itself:

- Ensure that all regional strategies recognise the issue of water resources and plan accordingly.

- Use the available funding, including the RDPE, to support the creation of high-flow storage reservoirs for public and agricultural use.

- Recognise the importance of irrigated agriculture to the economy of the region and take steps to encourage further co-operation and efficiency measures through Water Abstractor Groups etc.

- Encourage better co-ordination of functions and funds of the Environment Agency, Natural England, spatial planning authorities and other bodies to achieve additional water resources, wherever possible combining this with other benefits such as flood risk management, recreational and environmental enhancement.

- Promote the importance of water and encourage efficiency in all sectors including the public.

- Promote best practice by working with developers to set up a range of water efficiency demonstrators.

The areas in which we need support from central government:

- Recognise the special requirements of the Greater South East region in terms of the need to develop additional water resources.

- Co-ordinate the governance and funding of flood defence, water resources and environmental management.

- Promote a positive attitude within planning policy and regulation to the creation of reservoirs to capture peak water flows.

- Consider amendments to the Building Regulations to enforce rainwater capture, use of grey water and water efficiency measures in new buildings.

- Encourage water efficiency in all households through incentives, education, and removal of water inefficient devices from the market.

- Encourage water companies to undertake much higher levels of leakage control.

- Recognise that levels of funding in existing schemes such as HLS/RDPE are not adequate for the creation of reservoirs that can deliver water security alongside environmental and recreational benefits.

- Permit more flexible abstraction licences to allow maximum utilisation of water in times of plenty and sharing between users in times of drought.

Timings

This paper in draft was presented to the Environment Agency in response to its Water Resources Strategy consultation (31 October 2007).

The paper will be presented to Ministers and the appropriate regional bodies at the first available opportunity.

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November 2007