

Were You There?

Well, if not, you should have been....

MEASURING WATER, PAYING FOR WATER

A half day meeting of ICID was held on 11th October 2000 at the Institution of Civil Engineers, London. Three speakers from the Environmental Agency, Cranfield University and the National Farmers Union discussed the subject taking into account the need for an equitable distribution between various users.

Dr Glenn Watts, Principal Water Resources Planner, Environmental Agency (EA) Bristol, described their work on water resource strategy but was not in a position to reveal the final plan because this was being published in December 2000. Over the last two years national and regional water strategies have been considered.

The strategic objectives are to manage water resources to give no long-term degradation. It is necessary to assess the impact of different social and economic scenarios and identify risks and uncertainties. Through this a framework is provided to identify actions and opportunities for the EA and others to act.

The EA looks to high and stable rates of economic growth with protection of the environment. Thus it is necessary to make wise use of natural resources and contribute to social progress.

Considering climate change and changes in society it is possible to forecast future trends using:

- Standard demand forecast method
- Assumption of change varying according to scenario
- Internally consistent across different sectors

All start from today's conditions with changes more significant after the year 2010.

As an example influences on household consumption were then given:

- Low affluence, low take of water with a mix of efficient technology and high standard of maintenance to a low level of repairs
- High economic growth and personal affluence but more garden water, swimming pools and power showers giving about the same demand
- High affluence but also aware of environmental impact giving lower demand
- Wide uptake of demand measures, community initiatives and rain water harvesting.

Key drivers of spray irrigation demand were then discussed. These are:

- Common Agricultural Policy (CAP) and World Trade reforms
- Role of the supermarkets
- Changing pattern of crop production
- Organic production
- Drought tolerant varieties
- Irrigation efficiency.

Leakage has reduced dramatically over the last five years and there has been some change over the last 10 years.

However, without further attention leakage could increase quite quickly.

To meet incremental demand there are a wide range of options based on supply and demand. It was thought that schemes such as towing icebergs are not viable. A twin track approach is used to give timely development of new resources as necessary. Because of the risks and uncertainties solutions have to be robust and flexible.

The strategy is due to be announced in December 2000. This has been built up from regional strategies and will not be the final word because there will be debate and also annual bulletins on progress. Regional strategies are due in January 2001.

A question was raised concerning demographic changes and this is in the scenarios, to a certain extent. It was also pointed out that planning for the future is based on the location of resources rather than on where people want to live. There is a limit to what can be considered and this was encroaching on political decisions. Also the EA will not propose reservoirs because this is up to the water companies. A participant said that agriculture used a lot of water but most of this is returned. Dr. Watts agreed this was true but quality was reduced and the water would be further down the catchment. In reply to a further question it was confirmed that water is being imported through food. The significance of an ageing population was raised. Household formulation is the scenario with 2.4 children. Ageing population probably could be significant.

Dr Keith Weatherhead, Senior Lecturer in Soil and Water Engineering, Silsoe College, University of Cranfield, discussed irrigation water use by farmers.

Keith opened his talk by saying that he would discuss current usage, benefits of irrigation, cost of water, economic instruments and water trading.

Statistics were given showing the area irrigated for the main crops and proportion of water consumed. This demonstrated the disparity between the two for some crops. For example of the 140 000 ha (2 per cent of total cultivated land) 61 per cent of the early potato crop was irrigated whereas the crop uses only 6 per cent of the total water consumption of 150 000 million m³. Main crop potatoes are the main user taking 45 per cent of the total supply. All irrigation is farm managed and ADAS says that the irrigated area of two per cent of total cultivated land gives 20 to 30 per cent of the total value.

The average applied to irrigated crops is 100 mm and irrigation forms only 1 per cent of total abstractions. It is concentrated in the drier regions, drier years and during the summer months. Demand is growing by 3 per cent per annum. There is a large demand in the Fens and in Kent there is no surplus water. Demand varies from year to year with average demand about half the 1 in 5 dry year requirement. Permitted abstractions are always less than licensed amounts. Growth of irrigated water demand will be in East Anglia and growth is concentrated in high demand areas.

The Government supports the reasonable use of water for irrigation because it will maintain rural employment and profitable agriculture. It can reduce imports and gives a reduced environmental impact because of reduced transport and less agricultural inputs such as fertiliser because of higher crop yields. An increase in world trade could give a small decrease in water demand. Most of the irrigated crops in the UK are not subsidised or grant aided.

Farmers irrigate because of the timeliness of planting and harvesting together with increased yield and quality. For example, small fruit benefits can be as high as £6.50 per m³ of water. Irrigated grass gives hardly any increase in value.

A map giving the potential financial impact of an abstraction ban showed a high concentration round Cambridge.

Abstraction licence costs and annual abstraction costs were outlined. To obtain a licence there is an application fee (£110), advertising costs, environmental impact assessment, monitoring and testings costs, site requirements such as weirs and gauges, and annual charges. Annual abstraction charges are based on licensed volume (£8-£20/Ml) multiplied by a source factor, season factor and loss factor. Cost is based on licensed quantity so that a unit charge of 20 p per m³ will double to about 40 p per m³. Water costs are about 10 per cent of total costs. In the case of spray irrigation only a two-part tariff is used based 50 per cent on licensed volume, 50 per cent on abstracted volume.

Current irrigation water resource issues are abstraction licensing legislation, economic instruments, tradeable permits, environmental legislation, climate change, and water conservation on-farm. Economic instruments consists of price signals which ensure efficient allocation of bounded resources. That is if it costs you more, you will use less, releasing it for higher value users.

Abstraction charges are too low to influence demand. Higher or more targeted charges could have an effect. There would have to be a large increase and would be an extra tax on farming. At present the charge raises £3 million per annum. It is very difficult to reflect spatial and temporal variations in the value of water.

With tradeable permits a perfect market in water rights would achieve optimal distribution of water resources. Some trading already takes place through land sales, agreed simultaneous variations and transfers from reservoirs. Trading could only be within catchments and aquifers and could activate sleeper licenses. It would have no link to reasonable need and trading between sectors could have undesirable side effects such as water companies buying all the licences. The link with Catchment Abstraction Management Strategies is unclear. The DETR view is increasing charges beyond cost recovery is not the best way to reduce abstraction and, in principle, abstraction license trading should be promoted.

Discussion raised the fact that if the infrastructure had been put in then there is an incentive for the farmer to use irrespective of the annual charges. Sector allocation depending on availability was also raised. This was considered to be a possibility because at present farmers build reservoirs for security of supply.

Jacob Tompkins, Environment Policy Adviser, Environment & Land Use Department, National Farmers Union, gave the farmers views concerning the allocation and use of water for

irrigation. The NFU represents 70 000 farmers which is 80 per cent of the total.

Water issues were raised giving:

- Water Bill-draft due in December 2000?
- Economic Instruments-trading and charges
- Water Industry Competition
- Catchment Abstraction Management Strategies
- Water Framework Directive
- Environment Agency Water Strategies
- NFU Waterwise and Farm Water Audits

Water is of increasing economic importance in a long term business. The NFU has a commitment and a contract with society. It is estimated that an investment of £1000 million could be made in water storage facilities in East Anglia.

The draft Water Bill could contain a requirement for all trickle irrigation systems to be licensed. It would preclude 'grandfather rights' and make all abstractions time-limited. There will be the removal of immunity from liability. Compensation will be met from abstraction charges. On the Isle of Wight 800 people are employed as a result of irrigation and they could be affected by the proposed changes. Also if time limits are introduced then these should be 25-30 years in order that a viable investment can be made. Also if an efficiency strategy is pursued then this should also apply to domestic supplies. It is felt that compensation should come from general taxation.

Catchment Abstraction Management Strategies will consist of the EA, from April 2001, assessing water status in all catchments without the benefit of local consultation. The EA will assign a sustainability status to each catchment and revoke or reduce licenses in catchments with unsustainable water resources.

In the NFU 'Contract with Society' it pledges to look at farm water audits working with the EA, academics and green groups. These audits should be voluntary, simple and cheap and will involve organisations such as Greenpeace and RSPB. Lots of audits have been carried out but little has been published.

It was thought that increasing charges is too blunt an instrument to be fair and equitable. Water companies would out bid farmers and pass the charges onto customers; this is not the case for agriculture.

It was felt that if licenses are reduced or revoked for the public good, then compensation payments should be funded from the public purse. There must be proper environmental grounds for reductions and these could be based on secondary indicators such as plant life.

Trading should be within sector and regulatory burden must be kept to a minimum. The question of liability should be addressed because of the latent problems which may only arise after a trade. There is concern about sleepers being activated because of trading possibilities and this gives concern about speculation. In general, trading may be beneficial and a pilot trial in, say, the Isle of Wight would be expedient. Here there is a reasonable relationship between EA, farmers and water companies.

A survey of farmers gave 500 responses. Although the survey could be considered rudimentary it did raise the

immediate comment from the audience that this was useful data and probably the only such survey available. It was possible to provide multiple answers to some of the questions thus giving the appearance that some of the responses totalled more than 100 per cent. The survey produced a number of histograms. These showed that:

- 35 per cent used trickle irrigation
- 75 per cent thought that mains water was too expensive
- 38 per cent thought that abstracted water was too expensive
- 36 per cent used mains water
- 63 per cent of mains water users read their meters quarterly
- 50 per cent made daily or weekly soil moisture measurements
- 20 per cent disposed waste water into sewers and 50 per cent into land drains (open ditches)

A suggestion was made that summer abstraction licenses should be made more expensive to make reservoirs feasible by giving lower cost winter abstraction licenses. The reply was that farmers have no money for capital works and winter abstractions could cause problems with other users. It was suggested that while trickle irrigation may have a significant number of users the area may not be very large. Many of

these systems will use domestic water supply because this is filtered water at sufficient pressure for direct use. It was pointed out that a survey had to be inclusive in case new methods of irrigation were developed. In North Lincolnshire high value crops are irrigated from the mains. In the future supermarkets may insist that only high quality water is used.

A comment was made about water trading in Australia with this being carried out within the sector and seems to be satisfactory. In contrast there is a free for all in Chile with the mining companies able to buy up everything. It was agreed that the farmers are scared of water companies. It was suggested that farmers under-irrigate because they lack measuring equipment. With trickle irrigation the required quantity of water can be applied. Trickle is more appropriate for some crops than others. Efficiency should be measured as turnover per m³.

What was evident from both the presentation and discussion was the degree of unanimity in that there is only a finite quantity of water available and the need to distribute this equitably amongst all users.

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