EA Sustainable Development

LOCAL AGENDA 21 UK

LOCAL AGENDA 21
ROUNDTABLE GUIDANCE

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Sustainable Water Management
Promoting Water Efficiency

ENVIRONMENT AGENCY

LGMB

ROUNDTABLE GUIDANCE

At the Earth Summit in Rio de Janeiro in June 1992, world leaders signed a global environment and development action plan called Agenda 21. Over two thirds of Agenda 21 cannot be delivered without the commitment and cooperation of local government and the key role of local authorities is set out in Chapter 28. Each local authority is encouraged to develop and adopt, by 1996, a Local Agenda 21 - a sustainable development strategy at the local level, involving partnerships with other sectors, such as businesses, community and voluntary groups.

Sustainable development has been described in the Brundtland Report for the World Commission on Environment and Development as "*development which meets the needs of the present without compromising the ability of future generations to meet their own needs*".

On 8 April 1998 the LGMB held a seminar organised and facilitated by the Environment Agency on the subject of sustainable water management with the purpose of producing this Roundtable Guidance Note.

There were presentations as well as working groups sessions that addressed the issues and provided a framework and the stimulus for this Guidance Note.

To give an idea of the number of organisations that have an interest in the subject and can contribute as partners in delivering water conservation there were representatives from:-

LGMB, Local Authorities, Environment Agency, Water UK, Esssex and Suffolk Water Company, Thames Water Company, Three Valleys Water Company, Scottish Water Authorities, Ofwat, RSPB, New Policy Institute, Audit Commission, Department of the Environment Transport and the Regions, Global Action Plan, Going for Green, National Housebuilders Federation, UNED UK, BRE, BSRIA, The National Trust and Water Dynamics.

This Guidance Note, because of its interest to a large number of organisations, has been compiled with a wider audience than just local authorities in mind.

The UK local authority associations have set up a Local Agenda 21 initiative to assist local authorities in achieving sustainable development. A major document entitled "A Framework for Local Sustainability" has been published, as has A Step-by-Step guide to Local Agenda 21 and a guide to producing a LA21 strategy. A number of cross-sectoral roundtable discussions have been held to draw up guidelines for sustainable development in various topic areas. Topics covered include:-

1 community participation
2 North/South linking for sustainable development
3 greening the local economy
4 educating for a sustainable local authority
5 planning, transport and sustainability
6 green purchasing and compulsory competitive tendering
7 sustainable development in rural areas
8 nature conservation and Local Agenda 21
9 the sustainable management of solid waste
10 women and sustainable development
11 action on the coast
12 local agenda 21 and young people
13 health and sustainable development
14 ethnic minorities and sustainable development
15 sustainable agriculture and food

"The Local Government Management Board is governed by a board of elected members nominated by the local authority associations. It represents the interests of local authorities throughout the country. At present there are separate financial arrangements covering the provision of services, including publications, to Scottish authorities.

By focusing on management and human resource issues, the LGMB helps local authorities to be more effective in their work, the way they deliver services and the way they provide democratic leadership in their communities. It seeks contributions and suggestions from local authorities to enable it to provide a responsive, relevant service".

EA-Sustainable Development

Sustainable Water Management - Promoting Water Efficiency

INTRODUCTION

Water fulfils important functions in the environment and for society as a whole. The provision of a plentiful supply of clean water is a basis of public health policy and the management of water resources must be seen in this context. The prime concern must be to safeguard public water supplies with minimum environmental impact.

Whilst there is, on the whole, a reliable supply of water across the UK, it must be managed accordingly. Options for management include water storage, transfers between areas, and reducing the demand from customers.

There are many benefits from water conservation. Water bills are reduced, expensive new water abstraction or reservoirs can be avoided or delayed, rivers and wetlands can be improved. It must not be forgotten that there are other direct environmental benefits such as energy saved, reduced water treatment costs and less pollution.

A wide spectrum of organisations have a vested interest in water conservation, or water demand management. There are many ways of conserving water and, in any one local situation, maximum benefit is achieved when all the possible options are considered and costed. However no single organisation has a monopoly on the planning, delivery and monitoring of water conservation measures. There has been a very positive recent trend towards partnerships being formed to deliver water conservation.

With the prospect of an extra 4.4 million new households due to be built between 1996 and 2016 combined with climate change putting further pressure on water resources, the LGMB and the Environment Agency held a seminar on 8 April 1998. It brought together many of the main players in water conservation with a view to helping people involved in LA 21 deliver water conservation in partnership with organisations with complimentary expertise.

Rio

The 1992 Earth Summit in Rio drew up a framework for future action on sustainable development world-wide.

The main thrust of implementing local sustainable development was through **Local Agenda 21 (LA21) - a Comprehensive Action Plan.**

Such action plans would be carried out and facilitated by local authorities adopting Local Agenda 21 strategies. Prime Minister, Tony Blair, re-emphasised the UK's continuing commitment at the UN General Assembly Special Session on the Environment in June 1997 by saying that *'I want all local authorities in the UK to adopt Local Agenda strategies by the year 2000'*. Around 70 per cent of UK local authorities are now engaged in LA21. Water remains one of the key environmental issues as illustrated most recently in the report of the **UN Commission on Sustainable Development** held in April 1998 in New York.

EU

The EU's sustainability theme is to be found in the **Fifth Environmental Action Plan** and the proposed **Water Framework Directive**.

UK

The UK Government showed its commitment to sustainability in 1994 with **Sustainable Development - the UK Strategy** which included chapters on freshwater and land use. In February 1998, local and central government jointly produced Sustainable Local Communities for the 21st Century - **Why and How to Prepare an Effective Local Agenda Strategy**. This emphasised that LA21 is not only for local authorities but needs to involve all who are working at the local level - either in Government agencies, NGOs, business or community groups, town or parish councils, the educational sector or the individual citizen.

Sustainability must always be seen in the widest sense. The UK objectives of sustainability, are set out in **Sustainable Development - Opportunities for Change**, the consultation paper on a revised UK strategy. This aims to ensure a better quality of life for everyone, now and for generations to come through:-

- social progress which recognises the needs of everyone
- effective protection of the environment
- prudent use of natural resources
- maintenance of high and stable levels of economic growth and employment.

Water

Opportunities for Change calls for views '*on what further action can be taken to ensure that our water resources are managed in a sustainable way*'. Water conservation often implies energy saving, usually through pumping, saves natural resources through reduced use of chemicals in water treatment and reduces the quantity of sewage to be treated.

Many of the UK's waste minimisation projects are centred around a reduction in water use. Lowering pollution to levels which do not damage natural systems is often assisted by reduction in water use. Reduction in water abstraction can protect habitats and biodiversity.

There are frequently additional benefits to society deriving from reduced water use. Achieving sustainability is an holistic process and those working towards it should seek to maximise benefits, for example by reducing energy or waste.

WHY SAVE WATER?

4.4 million new households

The Government paper **Household Growth - Where Shall We Live** was issued in November 1996 and has subsequently generated a great deal of political debate. The population projections are fairly static, but as average household size falls there is less opportunity for communal saving so individual per capita consumptions rise. Hence, in many areas, a rise in the demand for water is expected.

Climate change

The impact of climate change on water availability is uncertain. However, it is wise to plan for this by using water as efficiently as possible. The water utilities and the Environment Agency have co-operated to produce a set of future climate scenarios and their effect on river flows that can be used for planning purposes.

To protect wetlands

In the report **High and Dry**, six environmental organisations (RSPB, Friends of the Earth, WWF, the Wildlife Trusts, Plantlife and Butterfly Conservation) set up the **Biodiversity Challenge Group** to express their concern over 354 sites where the amount of water being abstracted may be threatening wetlands. Wetlands include rivers, large and small, water meadows, reed beds and swamps, open waters including lakes and reservoirs. The attractions of wetlands not only include the flora and fauna but recreational aspects such as walking, fishing and sailing. Since then English Nature and CCW have identified 56 nationally and internationally important sites that have been costed. The sites are listed in the Agency's document **A Price Worth Paying**. The Environment Agency's predecessor, the National Rivers Authority, identified forty 'low flow' rivers which required immediate attention.

Customer awareness

Surveys have show that customers have a great empathy towards water conservation and sustainability. The Environment Agency published the results of such a survey in December 1997 which showed that the public were willing to pay for specific environmental improvements. The DETR soon afterwards published a survey on customer's views about broad environmental priorities and which supported the Agency's findings.

Demand/supply balance

The 'demand/supply balance' debate is now a crucial part of the regulatory process in the water industry. The economic regulator Ofwat has said that new major resources can only be justified when all the other demand management related option have been explored. The application of cost effective water conservation can result in lower water bills.

WAYS OF SAVING WATER.

There are 'indirect' ways of saving water through the applications of regulations, through the planning process and through education or publicity. There are a number of 'direct' ways as follows:-

Low use appliances/retro-fit

'Good housekeeping' applications. Low water using appliances can be installed at new sites or retrofitted at old sites. These include water and energy efficient washing machines and dishwashers as well as fixtures such a spray taps and low volume showerheads.

Reuse

'Greywater', such as bath and sink use, can be recycled for WC flushing. Rainwater can be collected and stored for similar purposes.

Waste minimisation

Where industrial processes are involved, waste minimisation techniques are becoming established to reduce water, energy and material costs.

Improved leakage control

Water companies are beginning to make great strides in reducing leakage in their mains, but schools, hospitals and many other institutions also benefit in reduced bills from introducing simple systems to detect and reduce leakage.

Extension of water metering

There are many properties that would benefit from lower bills if a meter were to be installed. Paying by meter can reinforce the message that consuming excess water costs money. Use of devices such as 'HIPPOS' in the cistern then have a more direct effect on customer's habits. However, several organisations, including the Local Government Association, are opposed to compulsory metering for essential domestic use and have expressed concerns about the impact of water meters on people with low incomes and other vulnerable groups. In May 1998, Government issued **Water Charging in England and Wales - A New Approach** which aims to address the issue of poorer families, particularly by encouraging water companies to develop more 'sophisticated' tariffs. Anglian Water have already introduced special tariffs to help both single occupants and low income families. The Water industry, Environment Agency, RSPB and CPRE have also produced joint research to tackle this issue.

Controllers on urinals

Significant savings can be made by installing proven equipment in urinals and reinforcing 'techno-fix' approaches such as spray taps and low flow showerheads.

There are several examples of these and other ways of saving water in the case studies later in the publication.

Local Authorities

23% of the respondees to the Environment Agency's consultation paper **Saving Water** were local authorities. They expressed full support for the whole programme with the solitary exception of the extension of water metering where just under a half had major doubts, particularly with reference to poorer families.

What can local authorities do?

Local authorities should lead by example by saving water on their own premises with their own staff fully committed to and educated in the process of saving water.

They own properties

They have the opportunity to apply water conservation methods to the management of their assets, thereby saving considerable sums of money. This can clearly be seen in some of the case studies and the examples of Oxfordshire and Kirklees in the Environment Agency's **Saving Water - on the Right Track**.

They have tenants who use water and many who have difficulty paying their bills

They can advise customers on how to be water efficient and also be advocates for people in low income groups.

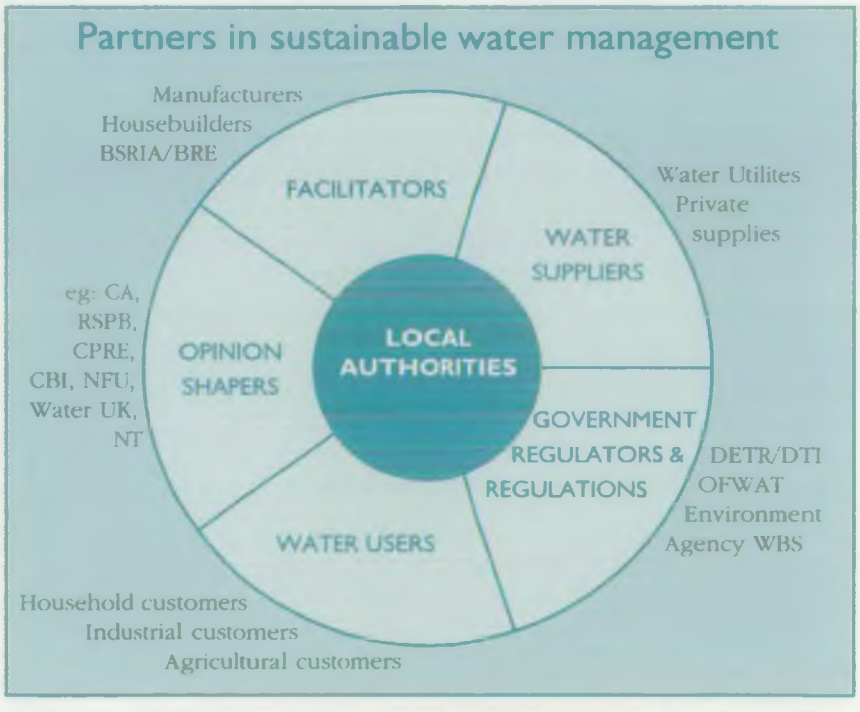
They are responsible for the planning process which allows, or turns down, new developments

The previous Government issued PPG 12 which suggested that water availability should be taken into consideration in local authority development plans. Where local authorities are taking their 'Local Agenda 21' responsibilities seriously it has in many cases led to their support for water conservation and demand management measures. However there is, as yet, no statutory requirement to consult water companies on the effect of new developments on local water resources. However the current consultation **The Future of Regional Planning Guidance** asks for views on *'how best RPG should advise on the location and level of new development in relation to water supply'.*

The water industry has called for greater cooperation between water companies and local authorities, including water companies being made statutory consultees in the planning process.

They are regulators.

They have the responsibility of upholding building regulations and trading standards. These include British and European Standards.



Close liaison between the trading standards, operations, environmental health and the planning side of local authorities should benefit the process.

They have customers

Local authorities can lead on local initiatives and communicate with the whole community. They can pass on or reinforce messages that others, water companies in many cases, may have difficulty getting across alone.

KEY PLAYERS

Local authorities.

Increasingly organisations are coming together in partnerships with local authorities. The following gives an idea of what the key players can bring to the party. This is not a full list and imagination should be used to ensure initiatives include partners best suited to deliver.

England and Wales

The **Local Government Association (LGA)** is the national voice for local communities in England and Wales. It speaks for nearly 500 authorities who between them represent over 50 million people and spend £65 billion each year. The LGA and the LGMB are encouraging all local authorities to have a LA21 strategy in place by 2000 and to incorporate sustainable development issues into service delivery.

County Councils

Produce the strategic development plans that set the context for local plans. It is important that they include general guidance on water conservation if it is to be featured in the local plans.

District Councils

Responsible for producing and enforcing local plans. Guidance on water conservation must be included if developments are to include water saving measures.

Metropolitan Districts, Unitary Councils and London Boroughs

Combine the county and district functions making them all purpose authorities or single tier councils that provide all the local authority services.

Parish Councils

Parish councils often carry out parish appraisals and the Countryside Commission has issued guidelines as to how these can be compiled. Such appraisals, which can include water conservation, can be fed back into the local plans.

LA21 Groups

Most local authorities have set up LA21 groups of local stakeholders to deal with specific local sustainability issues. They feed information, based on local consultation, back into the local authorities to help them carry out their duties and to deliver positive actions.

Scotland and Northern Ireland

All councils in Scotland are members of the Convention of Scottish Local Authorities (COSLA) which carries out a similar function to the LGA in England and Wales. There are 32 local authorities in Scotland ranging from city councils to predominately rural councils. They provide a single level of administration for all strategic and local matters.

All local authorities in Northern Ireland are members of the Association of Local Authorities of Northern Ireland (ALANI). There are county councils responsible for strategic development and urban districts responsible for local plans. There are rural districts dealing with local matters.

Regulators

Environment Agency

The Agency confirmed the high priority of water conservation by establishing the National Water Demand Management Centre in 1993, based in Worthing. The Centre has produced a series of reference reports in the **Saving Water** series. It also publishes the bi-monthly **Demand Management Bulletin** which gives the latest developments across the water conservation field.

The Agency's Contribution to Sustainable Development - Waste Minimisation gives details of, and contacts for, many of the local waste minimisation projects the Agency has supported. Promoted by the DTI, they bring together industry, local authorities, water companies and other local interests. The majority of them have a water conservation aspect.

In March 1997, the Agency issued a national guide **Liaison with Local Planning Authorities** and copies were distributed to all local authorities. It gives details of all the Agency contact points.

The Agency also has twenty six local area offices set up specifically to relate directly to the day-to-day local community on environmental issues. They produce Local Environment Agency Plans (LEAPs) for the main catchments. These are non-statutory documents intended to involve all interested parties in planning for the future.

The Agency has agreed a set of **Water Resources Planning Guidelines** with the water companies. The resulting plans will be published by the companies later in the year.

When considering application for new or altered abstraction of water the Agency considers whether the potential abstractor has adequately reduced leakage or applied sufficient water conservation methods.

Ofwat

The economic regulator in England and Wales has considerable interest in water conservation. Ofwat approves water companies' Water Efficiency Plans, and monitors *'their activities as part of its duty to enforce the promotion by water companies of the efficient use of water by the customers'*. Ofwat issue a number of annual reports, the most relevant of which is the report on **Leakage and Water Efficiency**. This publication summarises the water industry's water efficiency measures and highlights useful initiatives. Ofwat also sets the mandatory leakage targets that the government announced at the Water Summit in May 1997.

There are also ten regional Customer Service Committees that provide general advice on matters of concern to customers, and deal with complaints about water companies from household and business customers.

Scotland and Northern Ireland

In Scotland the environmental regulation is carried out by the **Scottish Environment Protection Agency** (SEPA). The environmental aspects in Northern Ireland are dealt with by Government through **DoE (NI) Water Services**. There is no equivalent of an economic regulator in either country.

Water Industry

Water UK, formed in April 1998, now represents the water utilities in the whole of the UK.

England and Wales

The work of the UK water industry in ensuring the sensible use of water was formalised in England and Wales in the Environment Act of 1995 which placed a duty on companies to promote the efficient use of water among customers.

Water companies have published water efficiency plans and they report annually on the progress to the regulators. These plans are publicly available and companies will readily provide customers with copies on request. This process includes wide consultation so that customers' ideas can be taken on board. They also produce much information on water efficiency for their customers - from leaflets on water efficient gardening to information on water saving devices.

Water companies have shown themselves very keen to exploit good ideas through joint initiatives, often with Local Authorities, and the adoption of new technologies.

The Water Industry funds the programme of **UKWIR** (UK Water Industry Research) which includes a number of collaborative projects on water conservation.

In addition, practical measures taken by individual companies include the distribution of free cistern replacement devices (such as 'Hippos'), provision of free water audits for houses (see case study on Watersmart), free tap re-washering services to mend dripping taps, information programmes and videos, newsletters, and education packs. A number of companies also provide a water audit service for business customers.

Since June 1997 the industry has been working with the Government to deliver the **Ten Point Plan** agreed at the **Water Summit**. This includes company leakage targets, provision of leakage repair services for customer's supply pipes and agreement of drought contingency plans.

Scotland and Northern Ireland

In Scotland and Northern Ireland water is in public ownership. In Scotland there are now three Scottish Water Authorities. In Northern Ireland the Water Services are part of the Department of the Environment.

Government

DETR/DTI

The Department of the Environment, Transport and the Regions (DETR) is the department with the main responsibility for water conservation. The Department of Trade and Industry (DTI) has a specific interest in the sponsorship of waste minimisation and energy saving.

The Department of the Environment (DoE) had the role of implementing the Government's commitment to sustainability and, in 1992, produced **Using Water Wisely** which helped open the debate in the water sector. The DETR is currently involved in the consultation to replace the water byelaws with new water regulations. These will incorporate additional water conserving measures.

In October 1996, the DoE issued **Water Resources and Supply: Agenda for Action** which sets the current policy in this area. Shortly afterwards the House of Commons Environment Committee published its report **Water Conservation and Supply** which debated the whole range of options and made a series of recommendations.

In February 1998, the DETR issued a consultation document **The Future of Regional Planning Guidance**. The fact that the paper asks for *'views on how best RPG should advise on the location and level of new development in relation to water supply'* illustrates that there is no current statutory guidance on the subject.

Audit commission

The Audit Commission has undertaken many thorough surveys

in the public sector. These include the efficient use of water in hospitals and schools where major cost savings have been made.

Other

NGOs

The **RSPB** is an influential organisation with a particular interest in conserving wetlands as described in **Waterwise**. With approaching a million members it has the ability to lobby forcibly.

The **CPRE** is also a high profile organisation, with about 50,000 influential members, that set out its stall in **Water for Life - Strategies for Sustainable Water Resource Management.**

The **Consumers Association** has keen interest in water matters and reflects customers' views. Of particular interest is the regular review of washing machines and dishwashers and their water consumption in Which magazine.

The **National Trust** is well known for its ownership and management of a huge variety of buildings, gardens and coast & countryside - and with 2.6 million members and over 50 million visitors to its sites each year it has to take the protection of water resources and therefore water conservation very seriously. It is a water company and a sewage treatment company in its own right - with over 4,000 properties dependent on National Trust water supply and treatment systems. The Trust is very keen to share its experience in developing water conservation measures and educational programmes and to learn from others in the process.

The **British Water Saving Forum** was established in November 1997 following the failure to set up a Water Saving Trust in a manner of the Energy Saving Trust. The sixteen original members came from a variety of stakeholders in water conservation.

The **UK Ecolabelling Board** was founded as part of the EC Ecolabelling Scheme. The Scheme is a voluntary one. There is also an EC Directive (95/12/EC) which requires labelling of energy and water use on household washing machines and dishwashers. Both systems have had problems in becoming universally accepted.

Manufacturers & housebuilders

The **National Housebuilders Federation** represents housebuilders in the UK. Several of its members are developing sustainable housing. Bellway sponsored a water conservation showhouse with the Environment Agency at the 1998 Ideal Home Exhibition. Crest Homes are currently promoting a showhouse in Shenley, Hertfordshire, in conjunction with Thames Water and Three Valleys Water.

Research & Associations

The **Water Byelaws Scheme** (soon to be called the **Water Regulations Advisory Scheme**) operates on behalf of all Water Suppliers in the UK to test fittings and appliances for compliance with Water Byelaws (Regulations 1999). The Scheme also provides advice (01495-248454) as a service to all enquirers on Byelaws/Regulations matters. It produces, twice yearly, the **Water Fittings and Materials Directory** and there is a series of customer-group booklets (railways, caravan sites, dental practices etc) on Byelaws/Regulations compliance and water saving. There are also information and guidance notes on related topics.

The **Building Services Research and Information Association** (BSRIA) is the UK's leading centres for building services research, and in this capacity the Association is carrying out a wide range of activities

Case study

- Water for Tomorrow

Gloucestershire County Council with Stroud District Council, Gloucestershire Vision 21, Environment Agency Vision 21, Hydro Action and the Wildfowl and Wetland Trust organised a conference **Water for Tomorrow - Wetlands and the Natural Solution** in October 1997 at the Slimbridge Wildfowl and Wetland Trust.

90 people, representing the whole range of local stakeholders, heard expert presentations and then participated in a series of structured workshops to identify action to be taken. The water issues specific to Gloucestershire for this jointly funded event were identified.

The workshops looked at the following issues and put forward a series of potential solutions in the following groupings:-

- stakeholders interested and active in communities
- stakeholders interested and active in farming and land ownership
- stakeholders interested and active in business and industry
- stakeholders interested in 'wildlife and recreation'
- stakeholders interested and active in 'regulatory groups'.

A report on the conference was issued to attendees together with a series of actions, 21 local and 8 national and international. Top of the list were:-

- Gather momentum - not just a one off event
- Establish a Local Water 21 Group.

Contact: Gloucestershire CC, Mike Simpson, tel: 01452-425829, fax: 01452- 425792.

Case study - Wiltshire - Water Engineer

Wiltshire County Council took the ambitious step of employing a full time Water Engineer in their Energy Unit with the expertise and enthusiasm to convey and apply the demand management message. The investment is being paid back several times over in cost savings. This year the council expect to save over £250,000 in water costs. All the county council's properties have been surveyed, water saving measures installed. Volumes of storage have been reduced and water leaks repaired. Such initiatives have had a greater impact because the staff involved have been educated in the advantages of conservation.

3 simple steps to water efficiency

- visit, survey, ascertain and understand the user (property buildings) needs
- implement water saving measures, urinal controls, repair leaks, spray taps, reduce storage
- educate - water is not for free - its like money, its soon slips through your fingers

Wiltshire County Council's Energy Services unit has installed over 450 urinal control devices and the scale of easy savings is shown by the following calculations:

A constant flush fill urinal using 9 litres of water, flushing four times an hour, twenty-four hours a day, 365 days a year. Given the cost of water at £1.7034 per cu. metre, the cost is £537.20 per annum. After installation flushing is twice an hour, eight hours a day, 240 days a year and the cost is £58.87. Given an installation cost of about £75 there is a saving of over £400 in the first year.

Given the success so far a second phase of measures is being put in place:-

- restrictaflow - reducing the flow of water to taps
- fitting water meter readout units in predominant places, ie secretaries' or head teachers' offices or fitting water meters in wall mounted boxes
- collecting rain water, recycling bath and washing machine water for toilet flushing
- continuing to replace old pipework rather than repairing individual bursts
- linking all meters to a central control unit that provides a target and monitoring system.

Some saving are not so obvious and need imagination and technical insight. Elderly person's homes usually have very high bills for laundry and particularly impressive was the observation that the large, commercial, machines, if fitted with a water pump, only required one wash rather than two washes. Not only has this the advantage of cutting water costs and energy costs, but the number of washes per shift is increased from six to seven. The estimated cost per wash as follows:-

Electricity - 1.5 kw at 7p/Kwh = 10.5p
Water - 150 litres at £1.33/m3 = 21.4p **Detergent** = 24.0p
Conditioner = 6.0p **Cost per wash** = 61.9p

Contact: Steve Hodges, tel: 01225-713244, fax 01225-713991

Case study - Vale of White Horse

Energy and water saving go hand in hand. In order to achieve such savings in the **Vale of White Horse District Council** and **Cambridge City Council** a joint HECA Action bid was made to fund a double-barrelled promotion of energy efficient white goods. The bid was in partnership with manufacturers AEG and Zanussi.

Scheme 1. Fuel Rich

Objective To provide discounted appliances to residents of the Vale of White Horse and Cambridge City Council, with an additional incentive in the first year of a £50 cashback after purchase. It was decided that this scheme would run through the local retailers, selling AEG machines. These retailers were then trained in the scheme procedures and energy efficiency training if required. This scheme was then advertised through a district wide mail shot, which was part paid for by the grant, and part by AEG. This was then followed up with local newspaper advertising, bus advertising and local radio advertising in Cambridge.

Scheme 2. Fuel Poor

Objective To provide discounted A & B rated appliances to residents on passport benefits, at a price equivalent to what would be paid for inefficient second hand goods. It was agreed that this scheme would be run using Zanussi appliances, as they were slightly cheaper, and that it would be run through the Vale Council. We were able to do this by establishing ourselves as a 'retailer' providing the appliances on a grant for residents. Zanussi gave us the usual retailer discount, plus an additional discount in line wish the scheme, taking into account that we had specified which appliances were to be used.

Residents were allowed to buy a specified fridge for £75, freezer for £100, fridge-freezer for £250 and washing machine for £200. Again it was limited to one of each per householder. Residents had to go to a council office to make an application, taking with them proof of benefit and up front payment.

Contact: Jo Rutteford, Vale Energy Team Leader on 01235 520202 or Gary Benn, Cambridge Housing Energy Manager on 01233 457832.

Case study- Hastoe Housing Association - Affordable Water

Hastoe Housing Association in Teddington have obtained an 'innovation and good practice grant' from the Housing Corporation to produce a comprehensive guide to encourage sustainable housing practice and reduce resident's bills.

A fifty page booklet **Affordable Water** was published together with a water saving leaflet. It is particularly aimed at housing associations and other registered social landlords but also highly relevant to those involved in housing development and refurbishment, customer advice to residents and those with a wide interest in water conservation.

It seeks to cover issues of water use in th house and provide outline advice on a range of water conservation methods.

These include reduced leakage, low flush WCs, waterless toilets, water efficient appliances and with reuse with recommendations for their use.

Following publication of the guide, discussions were held with other housing assosiations, the water company, the environment agency and the housing corporation to consider further action.

A longer term second stage is now underway with the employment of a full time member of staff to give direct advice and training to staff to give a direct advice to tenants and the staff of registered social landlords on setting up affordable water policies and providing guidance to tenants.

Contact: Anne Harries, tel: 01305-250103, fax: 01305-250106

related to water conservation in buildings. These include recent studies to review available water conservation measures, to provide advice on options for independent water supply and sewerage, and to investigate the potential for greywater and rainwater use. BSRIA is currently involved in a major new project, in collaboration with CIRIA (the Construction Industry Research and Information Association), entitled **Buildings that Save Water**. In this study up to ten demonstration sites will be monitored and best practice guidance will be produced for rainwater and greywater systems.

The Building Research Establishment (BRE) have introduced the BREEAM (the Building Research Establishment Environmental Assessment Method). Credits are given for good environmental practice and count towards a *'certificate of performance'*. There are many water conservation elements and details are given in their publication An **Environmental Assessment for New Buildings.**

WRc has carried out a good deal of research in the water conservation field, particularly in leakage control.

The United Kingdom Water Industry Research (UKWIR) procures research for the water utilities in the UK. It specialises in collaborative research with partners with a common interest.

A number of Universities have built up expertise in the area of water conservations. These include:- **The University of Coventry** on the Built Environment, **The University of East London** on water leakage, **Cranfield University** on greywater.

Other associations with an interest in water conservation including, the Institute of Plumbing, **the Institute of Landscape Architects and the British Bathroom Council.**

Case study- Devon and Cornwall Housing Association - Autonomous Technology

Cornwall Housing Association, the Department of the Environment, Transport and the Regions, The NatWest Group, The Environment Agency, Southern Electric, Devon and Northumbrian Water, Bhs plc came together to fund and steer BSRIA research on autonomous technologies. One of the studies was a new 17 house development in Perranporth, Cornwall for Devon and Cornwall Housing Association.

Autonomous technology is defined as 'those technologies, techniques and systems which enable buildings or groups of buildings to become partially independent of centralised services, where consistent with reduced environmental impacts'.

The houses were installed with greywater recycling and rainwater collection facilities. Rainwater was collected both from roofs, but the site was not amenable for the use of permeable paving. A variety of waste water and sewage treatment facilities were installed, including composting toilets, sceptic tanks, package sewage treatment systems and reed beds..

The report concluded that the most appropriate application of autonomous technologies is found to be in water services and that their inclusion is enhanced if there is an overall strategy to seriously consider its use at several sites.

Contact: Steve Mustow, BSRIA,
tel: 01344-426511, email: stephen.mustow@bsria.co.uk

Manufacturing & Consultants

The Bellway Home, on show at the Ideal Home Exhibition, demonstrated a wide range of ways of saving water. The manufacturers who co-operated in this venture were **Bosch** (dishwashers, washing machines), **Ecologic** (tap restrictor and other water saving appliances), **Myra** (low energy and water efficient showers), **Ideal Standard** (low flush toilets), **Water Dynamics** (grey water recycling) with the **New Homes Marketing Board** supplying a water efficient garden.

A list of all manufacturers of fittings and appliances has not been included, but examples are given in the case studies.

A number of organisations have been established in recent years that carry out water audits. A list of manufacturers is given in the report **Water Consumption and Conservation in Buildings** produced by BSRIA for an Environment Agency R&D project.

Case study- Essex & Suffolk Water - Watersmart

Essex & Suffolk Water were the first water company to pilot the **Watersmart Initiative** in partnership with Eaga-Services Ltd. Between May and October 1997, the **Watersmart Initiative** was piloted in Moulsham in Chelmsford. In total 1,419 audits were carried out. The response rate for the pilot was 76% of all domestic properties. A control zone in a similar, neighbouring area was established for comparative evaluation purposes.

In terms of the measures, the pilot delivered 5,449 individual measures, broken down as follows: 1,097 cistern devices were installed; 781 showerheads were replaced; 284 plumbing losses were reported (207 repaired); 220 water butts with 220 rainsavers were installed, 1,406 loft pipe and tank surveys were carded out and every household audited received a water efficiency pack and advice. Additionally, in conjunction with **Essex & Suffolk Water's** leakage survey, the **Watersmart** pilot detected and reported 22 external leaks.

The best estimate of the savings recorded is 55,000 litres/day, representing 10% of estimated average daily water delivered per property within the pilot zone. There is also significant potential for indirect and longer-term savings which are not included in these estimates.

The postal satisfaction survey revealed that 74% of participants identified *'wish to conserve water'* as their main reason for participation in the pilot. Over two thirds of participants stated that concerns over water shortages and drought were their main reasons to conserve water, 92% of respondents said they were satisfied or highly satisfied with **Watersmart** and over 50% indicated a willingness to make some contribution towards the cost of the service.

The postal survey also provided evidence that participation in **Watersmart** encourages the volunteers' take up of water meters. In total 21% of respondents indicated they would be interested in having a meter installed directly as a result of **Watersmart**.

Participation in **Watersmart** had a positive impact an customers perceptions of their local water company. When compared to the control sample, an additional 20% of households in the pilot zone agreed that the water company had helpful an knowledgeable staff, an additional 12% agreed that the company was adept at dealing with enquiries and an extra 6% agreed that the company was quick to deal with faults.

The cost of the pilot audits was £70,950, excluding the water butts and rain diverters. This equates to £50 per household, and was entirely funded by **Essex & Suffolk Water** The overall cost including water butts, rain diverters and external leakage surveys is £73,237. When the water savings are taken into account the calculated costs of the **Watersmart** pilot are £1.3m per Mld.

In addition to the calculated savings, the additional benefits which demand management programmes can provide need to be considered, such as: the ability to target savings at times of peak demand when water has the highest economic value; the ability to focus **Watersmart** on specific localities where supply is under greatest stress and where the costs of expanding supply would be greatest the impact of **Watersmart** on the image of the water company and customer relations.

Contact: Sarah Smith, tel: 01245-212360, email: sarah.smith@eswater.co.uk

IMPLEMENTING WATER CONSERVATION

A number of local authorities have already contributed significantly to water conservation. A number of examples have been collated in the Environment Agency's publication **Saving Water - on the Right Track.**

Kirklees Metropolitan Council (contact J. Milnes, tel: 01484-226114) and the **Royal Borough of Kingston** (contact: Trevor Adams, tel: 0181-2965930) both have programme of fitting appliances. **Oxford County Council** (contact Bob Warner, tel: 01865-792422) have introduced a scheme for reducing water use in schools and **Carrick District Council** (contact: Joe Robertson, tel: 01872-224329) are trialing 'rainwater harvesting'.

There are an increasing number of case studies which illustrate where water conservation is being successfully be applied.

As a guide to general areas of investigation, the following is a list taken from East Hertfordshire's internal checklist:-

non-housing

- install water saving devices
- install recycling systems
- landscape for low usage
- specify watering techniques for contractors.

housing

- install water saving devices
- install recycling systems
- landscape for low usage
- specifying watering techniques for contractors.

Four key areas were identified at the seminar in the process of achieving sustainable water management:-

Education

- as a key to motivation & promotion
- partnership
- regulation
- enforcement power & planning
- monitoring
- targets and indicators

Case study- National Trust - Waterless Urinals

Several **National Trust** properties have experimented with waterless urinals over the past year, with some success, principally reduced water consumption, elimination of foul odours and ease of cleaning. The Trust feels that is it now in a position to promote the wider use of waterless urinals in Trust properties, supported by operational experience from other users, including the Environment Agency. There are several makes of waterless urinal now approved for the UK. The Trust provides internal technical advice on the appropriate use of these devices, for new applications as well as conversions of existing urinals.

The waterless urinals tried by the Trust have been suitable for retro-fit into existing urinal bowls. They are now aware of a new make, the 'Waterless', which has its own bowl made of GRP, is more resistant to vandalism and will be suitable for new installations at Trust sites. The makers (Waterless UK Ltd) have offered to trial this model for the Trust, and have challenged us to find our worst urinals so that they can sort them out. Of the devices suitable for retro-fit, 'Whiff Away' has come out as the most user friendly and economical to use. The unit can be disassembled to aid cleaning and to allow access to pipes. The 'Whiff Away' has the backing of two household names, Diversey Lever and McAlpine, which guarantees ease of supply.

Contact: Robin Jarman, National Trust, tel: 01285-651818.

1. Education (as a key to motivation & promotion)

Education of all sectors of society, business, industry, opinion formers, decision makers and the general public as to the need to save water is crucial to the successful delivery of sustainable water management. Just as important is the education of these groups in how to save water.

Clearly education is crucial for achieving the three communication objectives of:-

- creating awareness of the issue
- educating to gain interest in the issue
- creating action (saving water)

Recent research conducted by the Environment Agency for promotion of 'effective methods of communicating water conservation' showed that water conservation was low on the list of public environmental concerns.

Education needs to be targeted to the audience and the following can be used:-

- local and specialist media
- education packs for schools
- direct mail 'did you know?' guides
- promotions
- advertising

Local authorities should include water conservation in any statements of environmental policy. A good example is given in the Hertfordshire case study. They can convey water conservation through local water business groups, schools, womens institutes etc.

There is a vast resource in educational material to use directly or to use as a platform for new material.

Case study - East Hertfordshire - Policy

Hertfordshire County Council's Policy on Sustainable Development

'The policies of this plan, together with those of local plans, will seek to enable activities and development in Hertfordshire to be carried out consistently with the principles of sustainable development.'

The general aims include: *'Make the most efficient use of water'.*

East Hertfordshire's Environmental Policy Statement

'Eliminate wasteful consumption of water in its own buildings and parks, and consider the specification, subject to value for money and where appropriate, water efficient systems in both new council developments and as and when replacements are required, in existing council owned properties.'

'Promote and assist, wherever possible, the elimination of wasteful water consumption in homes, schools, businesses and other premises in the district'.

East Hertfordshire - Local Plan

Policies are to be introduced which include:-

- water Conservation - in new buildings - promoting water conservation measures (or lack of them) to a material consideration in determining planning applications
- a policy which supports proposals for water recycling
- a policy which seeks the creation of water conservation conscious landscape designs in new development
- a policy which seeks the use of soakaways for surface water where this is more environmentally beneficial than discharge to water courses.

East Hertfordshire's Promotion of Water Conservation

The message of water conservation can be spread by such methods as:-

- distribute information through LA 21 networks
- distribute information through council newspaper
- subsidise the sale of water saving devices to household (water butts)
- setting up a liaison forum with local water company and Environment Agency
- institute 'waterwise' campaign (similar to 'Travelwise' and 'Waste Aware') - including links to local businesses
- organisation of promotional of promotional events and photo opportunities with local newspapers.

Contact: David Beales: tel: 01279-655261, fax: 01992-552280.

Case study -Liverpool

The social housing scheme in Liverpool aims to cut its residents' bills by 30%. **The Ecolite development**, designed by Architype, is just starting on site at Toxteth. It comprises 23 houses: a mix of two, three and four bedroom family houses, and two bedroom bungalows for the elderly, and is being built for **Harlow Park Housing Cooperative** with **CDS Housing Association**. All properties will be equipped with water consumption cutting measures which will include efficient showers, spray taps and low flush toilets. In addition, a group of six of the houses will be fitted with new greywater recycling systems, most likely to be the **Water Dynamics** Well Butt system. The £1.2 million scheme is due for completion in early 1999.

Case study - Anglian Water- Byelaws waiver

This is one of the new incentives introduced by **Anglian Water** as part of their **Approved Plumber Scheme**. If a developer uses an approved plumber then the Water Byelaws inspection is waived.

The developers can benefit considerably. They can continue the work of reinstatement without delay and can often get people into the homes earlier than might be the case if they had to wait for an inspection. The work still has to be done properly as **Anglian Water** perform random checks on the quality of the work.

Contact: John Smith, tel: 01480-323936.

There are the **Going for Green** and **Global Action Plan** campaigns. **Environment Technology Best Practice Programme** leaflets and guides reinforce this, showing case studies of savings in industry. The Environment Agency has a **Water Alert** campaign. Water companies issue many leaflets and use the media to give advice and guidance to their customers. This has been particularly true in the promotion of effective garden watering.

Companies are improving their customer relations through issuing free or low cost water meters and repairing customers' supply pipe leaks for free.

2. Partnerships

The delivery of a sustainable water future requires the co-operation of a very wide range of organisations.

Partnerships can be established for research, promotion and practical implementation. Some appear obvious, others require imaginative thinking. The case studies show examples of successful partnerships.

Case study - Action at Home

Action at Home is an initiative run jointly by the charities **Global Action Plan** and the **World Wide Fund for Nature**. Organisations and local government can buy into this programme that helps and encourages households to reduce their impact on the environment and to save money. It is aimed at the many people who want to create a better environment, but often do not know where to start.

Water use is one of the five issues addressed, the others being waste production, energy use, transport use, and shopping. Firstly, participants receive a questionnaire which enables **Global Action Plan** to give them a GreenScore. Then, every month for five months they receive an 'action pack' on each of the issues. These are full of simple tips, money off incentives and kids activities. The sponsor organisation can also add local information to the packs. In the sixth month participants receive a second questionnaire and they are given a new GreenScore which shows them the difference they have made as a result of taking **Action at Home**.

So far **Action at Home** has helped over 20,000 individuals and is an integral part of 30 local authorities' Local Agenda 21 plans. Recently the North West Region of the Environment Agency has taken part. The results of the initiative are the subject of a four year research programme with funding from the Economic and Social Research Council.

Contact: Sallyanne Flemons, tel: 0171-405-5633, fax: 071-831-6244.

Case study - East of Scotland Water - Wipe Out Water Waste

East of Scotland Water in partnership with Scotland & Northern Ireland Plumbing Federation (SNIPEF) and Edinburgh City Council are promoting a pilot project to demonstrate achievable water efficiencies in the home.

Wipe Out Water Waste (WOWW) will form a crucial part of our wider strategy to address the issues of leakage and water efficiency . The project will operate for four years within Edinburgh and is launched under the Governments **New Deal** initiative. It will include at least 100 **New Deal** participants in the first year and up to 150 in each subsequent year.

At the heart of the project will be a number of audit teams consisting of a fully qualified plumber from a SNIPEF member company and three participants from the New Deal. The teams will target a mixture of private and local authority housing offering inspectors and advice to householders.

The audits will be free of charge and will include:-

- toilet efficiency check (adjustment and repairs as necessary)
- fitting tap aerators
- toilet cistern displacement devices (where appropriate)
- advice on detergent free washing
- rain diverters and water butts
- fitting high performance shower heads
- survey of water using appliances with possible replacement schedule
- lead pipe detection
- internal leak detection and repair
- external leak survey
- frost protection check
- pipe insulation survey

Contact: Jonathan Cape, tel: 0131-453-7535.

Case study - Thames Water

Silver and Pearls is a musical play in eight scenes for primary schools. It was commissioned by **Thames Water** who consulted teacher and pupils. It has been distributed to all schools within the Thames Water supply area with the aim of promoting water conservation in an imaginative and fun way. It is targeted at primary school children and their parents, their teacher and governors. The musical play features Tialoc (an Aztec rain god), who return to earth to tell the audience about the importance of water to his ancient civilisation. He recruits children to be his helpers as they begin a musical journey to spread the message about the need to conserve water.

Contact: Phil Harris, tel: 0118-9593703.

The Agency's **Demand Management Bulletin no. 25** gave a list of some of the ongoing R&D projects. The Bulletin reports regularly on such partnership based ventures. The water efficiency plans of the companies also give an indication of partnership initiatives, both ongoing and planned. **Saving Water - On the Right Track** gives a more detailed look at some of the initiatives taking placed in the water sector with, again, a wide range of collaborators.

The water companies and the Environment Agency have recently cooperated, through UKWIR, on

Case study - Audit Commission - Saving Water in Schools

Water in schools and other public buildings is lost through pipe leaks, overflowing tanks, running taps and continuously flushing urinals. The remedies are primarily a matter of good housekeeping:-

- installing urinal flush controls; so that water is used only when necessary
- fitting taps with flow constrictors
- regular inspection for cistern overflows
- monthly monitoring of meters to identify leaks to underground pipes.

Water is also lost through evaporation when swimming pool covers are not installed - or not used each night - or when the water in the pool is changed too frequently.
Local performance should be compared against certain benchmarks.

Schools (without pools): 4m3 per pupil per annum. **Pools: 10.6 m3 per MI of pool per annum.**

Schools that exceed these targets should take meter readings when the school closes and again in the morning before it opens and any significant consumption should be investigated. High consumption may be due to poor controls, overflows or underground leaks. In one London local education authority, external auditors identified an annual saying opportunity of over £ 100,000.

The investment required to control consumption is generally small and the payback is often less than a year. Auditors have identified substantial potential savings at many councils. At one county, half of the schools exceeded the water consumption benchmarks and, as a consequence, an annual saving opportunity of about £300,000 was available.

Other measures can save money without necessarily reducing consumption. Councils can often reduce their bills by reducing the size of meters to match demand' and by analysing their bills. They can seek a rebate on sewage charges where water is used for playing fields, or is lost through leaks. In neither case does the water reach the sewage system and so incur a disposal charge.

In 1992-93, Coventry's auditors carried out a review of the council's water management systems. The review found that schools in Coventry could save £177,000 per annum through reduced water consumption and £40,600 per annum by reducing meter sizes. As a first step to realising these savings, the Council invested £50,000 in reducing water consumption. The treasurer estimated that this investment would result in annual savings of £95,000 per annum.

Water saving action plan

Action	Expenditure	Estimated annual savings	Action	Expenditure	Estimated annual savings
Meter size reductions	£ 8,000	£10,000	Urinal control devices	£25,000	£15,000
Push taps	£15,000	£ 5,000	Publicity material	£ 2,000	£65,000
Total	£50,000	£95,000			

- undertake systematic monitoring of consumption against benchmarks
- analyse monthly bills to identify sudden large increases in consumption that may denote leaks
- ringfence investment money.

Contact: Paul Orrett, tel: 0171-828-1212.

research into some of the fundamental issues on water resources and demand management. The RSPB and CPRE have recently joined in this cooperation for the study A Socially Acceptable and Environmentally Effective Strategy for Water Metering.

The contacts listing gives a list of potential partners.

3. Regulatory (enforcement powers & planning)

Water conservation should be included in Development Plans. An example is given in the East Hertfordshire case study.

In the case of local planning local authorities should incorporate water conservation into the deliberations.

Planning authorities should speak to their water company at an early stage when drawing up development plans in order to ensure that water resource and conservation measures are incorporated.

An approach, taken from East Hertfordshire, is to:-

ask applicants to consider how

they might incorporate water conservation devices/features
- provide information packs/contacts for follow up
- give advice on devices.

The Government is shortly to replace the old Water Byelaws with new Water Regulations. The new Regulations are more focused on the duty to *'prevent waste and undue consumption of water'*. The water industry's Water Regulations Advisory Scheme has set up a Water Efficiency Committee to oversee water efficiency issues with a remit to:-

- be the water industry's source of authoritative advice on water use in buildings
- ensure customers, both in the domestic and business sectors, are made more aware of the need to make efficient use of water.

It is preferable if those involved in buildings regulations, trading standards and planning within the local authority should work together on the subject of water conservation.

4. Targets & indicators

National indicators and targets are used by Ofwat to regulate the water companies. Leakage targets are published each year and the domestic household per capita consumption (pcc) is a measure of whether customer use is rising or falling.

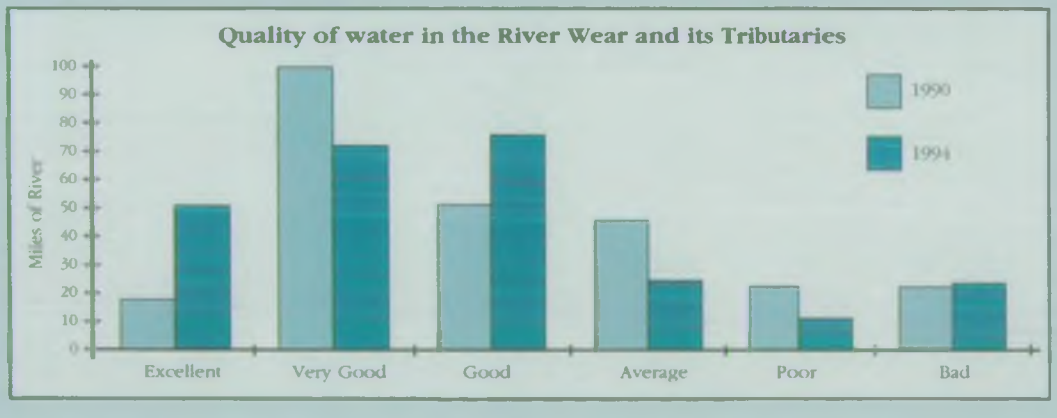
For local authorities it is possible to adapt these to the local situation as targets, where possible, should relate to the local community. The local water company and the Environment Agency should be able to help in devising local water and environmentally related indices.

Inicators and targets have been well developed for water quality, as the Durham County Council case study shows. However, similar effort needs to be put into delevoping water efficiency indicators in future.

Case study- Durham County Council - A Way with Water

Rivers are the hardest working of all natural environments. They drain the land, provide a water supply and sweep away towards from homes and industry. They provide enjoyable sport and recreation including Britain's two favourite pastimes - fishing and walking. It is a wonder that so many plants and animals can survive in Britain's busy rivers! Pollution from sewage works and industrial wastewater outlets has damaged rivers since the Industrial Revolution. In addition, drainage from farming areas often contains fertilisers and pesticides which can degrade water quality.

In **County Durham** the major rivers are cleaner even than 20 years ago. The decline in heavy industry allied to high investment in modern sewage treatment and bigger penalties on polluters has been effective. The River Wear was one or the most polluted, but has improved year by year. However, It is not out of danger yet. Minewater from abandoned workings needs to be continuously pumped to prevent It from rising and contaminating the river.



The cleaner river conditions being achieved is highly desirable for humans and is a good move towards sustainability.

Source: Durham CC Sustainablity Action Plan

Contact: Maggie Bosanquet tel: 0191 383 4253

Check list

- Is there a clear commitment to water conservation by local authority staff?
- Is there an internal policy of water conservation within local authority premises?
- Are these policies communicated within the departments (trading standards, operations, environmental health, planning) of the local authority?
- Is there an overall water conservation policy statement within the structure plan?
- Are there more detailed water conservation elements within the local plan?
- Is there communication with local population on water conservation?
- Does your local agenda strategy include water issues?
- Is the local water company and the Environment Agency involved in any of these processes?
- Has other expertise in NGO, associations and research bodies been called upon?
- Are any of these case studies applicable to the local authority?
- Have targets been set and a monitoring process been put in place with advice from local water companies and the Environment Agency?

Contacts

Local Government

Local Government Association, 26 Chapter Street, London SW1P 4ND, tel: 0171-664-3000, fax: 0171-664-3030, 0171-664-3131, Internet: http://www.lga.gov.uk

Local Government Management Board Layden House, 76-86 Turnmill Street, London EC1M 5QU, tel: 0171-296-6600, fax: 0171-296-6666.

Convention of Scottish Local Authorities Rosebury House, 9 Haymarket Terrace, Edinburgh, tel: 0131-474-9200, fax: 0131-474-9292.

Association of Local Authorities in Northern Ireland 123 York Street, Belfast, BT15 1AB, tel: 01232-249286.

Regulators

Environment Agency Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS12 4UD, tel: 01454-624000, fax: 01454-624409.

National Water Demand Management Centre Environment Agency, Guildbourne House, Chatsworth Road, Worthing, West Sussex BN11 1LD, tel: 01903-832275, fax: 01903-832274, HELPDESK: 01903-832073, email: nwdmc@environment-agency.gov.uk

Scottish Environment Protection Agency Erskine Court, the Castle Business Park, Stirling FK9 4TR, tel: 01786-45700, fax: 01786-446885.

Ofwat Centre City Tower, 7 Hill Street, Birmingham B5 4UA, tel: 0121-625-1300, fax: 0121-625-1400, email: dhall@ofwat.gtnet.gov.uk, Internet:http://www.open.gov.uk/ofwat Contact: Deryck Hall.

Water Utilities

Water UK, Queen Anne's Gate, London SW1H 9BT, tel: 0171-344-1844, fax: 0171-344-1866, email: contact@water.org.uk (Water UK is a contact point for the whole of the water industry in the UK)

Government

DETR Eland House, Bressenden Place, London, SW1E 5DU, tel: 0171-890-3000.

NGO's

Consumers Association 2 Marylebone Road, London NW1 4DF, tel: 0171-830-6000.

Country Landowners Association 16 Belgrave Square, London SW1X 8PQ, tel: 0171-235-0511, fax: 0171-235-4696.

CPRE Warwick House, 25 Buckingham Palace Road, London SW1 0PP, tel: 0171-976-6433, fax: 0171-976-6373.

Friend of the Earth 26-28, Underwood Street, London N1 7JQ, tel: 0171-490-2679, fax: 0171-490-1555.

National Trust 33 Sheep Street, Cirencester, Gloucestershire, GL7 1RQ, tel: 01285-651818.

RSPB The Lodge, Sandy, Bedfordshire, SG19 2DL, tel: 01767-680551, fax: 01767-692365. (RSPB host the Biodiversity Challenge Group).

Housebuilders

National Housebuilders Federation 82, New Cavendish Street, London W1M 8AD.

Research

Building Research Establishment Garston, Watford, Hertfordshire WD2 7JR, tel: 01923-894040, fax: 01923-664010, internet: http://www.bre.co.uk

BSRIA Old Bracknell Lane West, Bracknell, Berkshire, RG12 7AH, tel: 01344-426511, fax: 01344-487575.

UK Water Industry Research 1, Queen Anne's Gate, London SW1H 9BT, tel: 0171-344-1807, fax: 0171-344-1859, email: ukwir@compuserve.com

WRc Henley Road, Medmenham, Marlow, Buckinghamshire SL7 2HD, tel: 01491-571531, fax: 01491-579094, email: solutions@wrcplc.co.uk

Associations

British Bathroom Council Federation House, Stoke on Trent, Staffordshire, ST4 2RT, tel: 01782-747074, fax: 01782-74716.

British Water Saving Forum Agenda Services, 18 Ridge Road, Mitcham, CR2 2ET, tel/fax: 0181-640-1814.

Chartered Institute of Environmental Health Chadwick Court, 15 Hatfields, London SE1 8DJ, tel: 0171-928-6006, fax: 0171-928-6953.

Confederation of British Industry Centre Point, 103 New Oxford Street, London WC1A 1DU, tel: 0171-379-7400, fax: 0171-240-1578.

Institute of Plumbing 64 Station Road, Hornchurch, Essex RM12 6NB, tel: 01708-472791, fax: 01708-448987.

Water Byelaws Scheme WRc Evaluation and Testing Centre, Fern Close, Pen-Y-Fan Industrial Estate, Oakdale, Gwent NP1 4EH, tel: 01495-248454, fax: 01495-249234.

Other

Audit Commission 1, Vincent Square, London W1, tel: 0171-828-1212.

Energy Saving Trust 11-12 Buckingham Gate, London SW1E 6LB, tel: 0171-931-8401, fax: 0171-931-8548.

Environmental Technology Best Practice Programme (ETBPP) ETSU, Harwell, Didcot, Oxon OX11 0RA, Helpline 0800-585794, email: etbppenvhelp@aeat.co.uk
Going for Green Churchgate House, 56 Oxford Street, Manchester M60 7HJ, tel: 0161-272-5221.

Global Action Plan 8 Fulwood Place, London WC1V 6HG, tel: 0171-405-5633, fax: 0171-831-6244.

UK Ecolabelling Board Eastbury House, 30-34 Albert Embankment, London SE1 7TL, tel: 0171-820-1199, fax: 0171-820-104.

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Environment Agency

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- Saving Water - on the Right Track, 1998.
- Shot in the Dark - Money for Nothing and Your Waste Tips for Free, video, 1998.
- Optimum Use of Water for Industry and Agriculture Dependent on Direct Abstraction R & D Technical Report 157.

Ofwat

- 1996-97 Report on Leakage and Water Efficiency, 1997, ISBN 1-874234-32-9.
- 1998-99 Report on Tariff Structure and Charges, 1998, ISBN 1-874234-39-6.

Water Utilities

- All companies in England and Wales have produced Water Efficiency Plans and have publicity material etc on conserving water (see your local company for details or contact Water UK).

UKWIR

- Towards an Environmentally Effective and Socially Acceptable Strategy for Metering in the UK, 1998.
- The Economics of Demand Management, 1997.
- Effects of Climate Change on River Flows and Groundwater Recharge: Guidelines for Resource Assessment, 1997.

Government

- Using Water Wisely, 1992.
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- Scotland's Big Freeze - Lessons to be Learned, 1996.
- Planning for Communities of the Future, Command Paper 3885, 1996, ISBN 01-10-138852-7.
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- Water Conservation and Supply. Report of the House of Commons Select Committee, HMSO, 1996.
- Recommendations for Requirements to Replace the Water Byelaws, 1997, consultation paper.
- Water Summit, 1997 (DETR press release, summarised in the Environment Agency's Demand Management Bulletin no 24).
- Water Charging - A New Approach, 1998, consultation paper.
- Sustainable Development - Opportunities for Change, 1998, consultation paper.

NGO's

CPRE

- Pooling our Resources, 1996.

RSPB

- Waterwise, 1995.

Biodiversity Challenge Group

- High and Dry, 1996.

Other

Audit Commission

- Untapped Savings (water savings in the NHS), 1994.
- Its a Small World, 1997.

BSRIA

- Greywater and Rainwater Systems: Recommended UK Requirements, 1997.
- Water Conservation: Implications of Using Recycled Greywater and Stored Rainwater in the UK, 1997.
- Sustainable Housing - Options for Independent Energy, Water Supply and Sewerage, 1997.
- Water Consumption and Conservation in Buildings - A Review of Conservation Methods, 1998. (An Environment Agency R&D project, issued through the National Water Demand Management Centre).

Environmental Technology Best Practice Programme (ETBPP)

- Summary 1997. Lists all the Good Practice Guides, Case Studies from the DTI's/DETR's initiative. Many have water conservation element.

Water Byelaws Scheme

- Byelaws Scheme Bulletin, issued three times a year.
- Water Fittings and Materials Directory, issued twice a year.
- Customer- group booklets and information guidance notes on Byelaws/Regulations compliance and water saving.

Acknowledgements

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The roundtable discussion was held on 2 April 1998, at the Ideal Home Exhibition, Earl's Court, London. We gratefully acknowledge the support of the Environment Agency for this roundtable.

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