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Evolving Water Institutions in England and Wales: An Assessment of Two Decades of Experience

ABSTRACT

This paper traces the evolution of water institutions in England and Wales since the 1963 Water Resources Act, and the development of a much broader approach to water management than exists in most parts of the world. Interestingly, the perspective on water services has gradually altered from one based on local "welfare state" ideals of collective provision and finance to one in which water is viewed more as an economic good to be supplied by business and market oriented organizations. The government has declared its plans to "privatize" the water industry and, while this step is yet to be taken, there appears to be a growing acceptance of the idea that economic rules should guide allocation, charges and prices. The adequacy of water institutions in England and Wales is assessed using nine evaluative themes which relate directly to the various objectives of water management.

INTRODUCTION

Water management in England and Wales has reached an important new stage in its evolution representing a major change in direction. The water industry there has been the subject of several major reorganizations in recent times, occurring about once every decade. Beginning with the introduction of the 1963 Water Resources Act,¹ and continuing with further legislation in 1973 and 1983, major alterations have been made in policies and administrative structures. The areal focus has moved from the local area to the larger, river-basin-based region. Water management functions have become concentrated under one roof. Economic principles have been introduced into pricing policies. Conscious attempts are being made to integrate water policy with other areas of government policy. During this period the financing of water management and the shape of water institutions have become important political issues as the water industry has been forced towards the center of the political arena.

The latest phase of change involves an attempt to remove the industry from the public sector. Wishing to reduce its expenditures and to promote

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1. 1963 Water Resources Act, ch. 38.

greater efficiency in public sector activities, in 1986 the Thatcher government began studies of the possibilities for, and the implications of, "privatization" of the water industry. By mid-1986 it appeared to be ready to make a major move in this direction by introducing legislation in the fall of that year. After much discussion, in the House of Commons, the media and elsewhere, however, the government decided to postpone action until after the coming general election, due by the summer of 1988. Meanwhile the debate continues. The government has reconfirmed its intent to privatize the water industry. Even if privatization is not fully introduced, it is certain that further important changes in water institutions in England and Wales are in prospect. These will be of particular interest, not only to water managers in the United Kingdom, but to planners and policymakers elsewhere, notably in North America and Australia where similar challenges are now being faced.

An important point in the evolution of the water industry in England and Wales has been reached where it seems useful to pause and reflect upon two decades of institutional change. What were the stimuli for such a change? What was the intent behind the various modifications of legislation, policies, administrative structures and procedures? Have these modifications succeeded? What are the problems that remain to be faced? These questions provide the central focus for the discussion which follows.

EVALUATIVE THEMES

Laws, policies, and administrative structures and procedures provide an institutional framework within which resources management decisions are made. Such a framework changes over time, in response to pressures from unresolved problems on the one hand, and the emergence of new ideas and changing social values on the other. While in general change tends to be slow and incremental, occasionally it is dramatic and "revolutionary."

In recent times there has been a good deal of discussion among economists, political scientists, geographers and others about the "adequacy" of resource management institutions. This has been especially so with respect to water resources. Of particular concern have been the procedures for allocating water among alternative uses, the bases for setting prices and charges, and coordination within and between levels of government of the public in decisionmaking.² From the resulting literature has come

2. Much of the initial discussion focused upon economic aspects, and especially the management of water resources in the United States. See, e.g., J. Hirschleifer, J. DeHaven & J. Milliman, *Water Supply: Economics, Technology and Policy* (1960); J. Krutilla & O. Eckstein, *Multiple Purpose River Development: Studies in Applied Economic Analysis* (1958). It has since moved on to deal

a variety of suggestions as to criteria that might be used to assess the responsiveness of water management institutions to new challenges.

Fox and Craine addressed the issue of institutional criteria in the 1960s and 1970s.³ In their analysis, the concepts of unified river basin management and democratic decisionmaking figured importantly. They focused upon such matters as adequate legal powers for water management, efficiency and equity in their design of water institutions. Subsequent evaluations of water institutions frequently used one or more of these criteria,⁴ often redefining, molding and developing them to suit particular studies and to generate new insights and explanations.⁵

An analysis of previous work, together with a knowledge of themes which are particularly pertinent to the mid-1980s, indicates that an evaluation of water institutions in England and Wales should be primarily concerned with nine criteria,⁶ which are discussed below. While these criteria are considered to be of prime importance, they are not the only criteria which could be used to assess the adequacy of water institutions. Where relevant, other factors are also commented upon below. For example, the professional and disciplinary composition of water agency staff is an important institutional factor which sometimes threatens to constrain the adequacy of management. Thus water agencies should perhaps also be judged by their staff development and recruitment programs. Some authors, such as Craine,⁷ identify administrative flexibility as an important criterion: whether the administrative system possesses the capacity to adapt to new ideas, information, resources and technologies, and whether administrative discretion is provided for in the law. Others ask whether the range of choice of solutions to water problems is adversely

with other dimensions and to address the situation in other countries. See, e.g., G. White, *Strategies of American Water Management* (1969); E. Haeefe, *Representative Government and Environmental Management* (1973); J. Dales, *Pollution, Property & Prices* (1968); R. Johnson & G. Brown, Jr., *Cleaning up Europe's Waters: Economics, Management and Policies* (1976); *Managing the Water Environment* (N. A. Swainson ed. 1976); Fox, *Institutions for Water Management in a Changing World*, 16 *Nat. Res. J.* 743 (1976).

3. Fox and Craine, *Organizational Arrangements for Water Development*, 2 *Nat. Res. J.* 1 (1962); L. Craine, *Water Management Innovations in England* (1969); Craine, *Institutions for Managing Lakes and Bays*, 11 *Nat. Res. J.* 519 (1971).

4. See, e.g., L. James & R. Lee, *Economics of Water Resource Planning* (1971); B. Mitchell, *Water in England and Wales: Supply, Transfer and Management* (1971) [Liverpool Univ. Dep't. of Geography Research Paper 9]; L. Barr, *Areal Organisation of Water Management in England and Wales* [Unpublished thesis, available at the University of Victoria, British Columbia] (1973).

5. See, e.g., A. Kneese & B. Bower, *Managing Water Quality: Economics, Technology and Policy* (1986); D. Okun, *Regionalization of Water Management* (1977); E. Porter, *Water Management in England and Wales* (1978); D. Parker and E. Penning-Rowsell, *Water Planning in Britain* (1980); W. Sewell, J. Handmer & D. Smith, *Water Planning in Australia: From Myth to Reality* (1985).

6. E. Penning-Rowsell & D. Parker, *Water Planning Institutions: Evaluating Current Arrangements and Future Possibilities in Britain and Australia* (1986) (Working Paper 83, Centre for Resource and Environmental Studies, Australian National University, Canberra).

7. L. Craine, *supra* note 3, at 20-21.

constrained,⁸ while others question whether there are adequate administrative and planning linkages between water agencies at the local, regional and national levels.⁹

The River Basin Management Concept

The river basin or catchment area has become increasingly recognized as a particularly appropriate areal unit for water management.¹⁰ For technical and economic reasons, hydrological boundaries are regarded by those within the water industry, as well as by other professionals, as strongly preferred boundaries for water management agencies.

The rationale for river basin management stems from the concept of the river as an organic system characterized by physical linkages and interdependencies which translate into economic ones.¹¹ For example, effluent disposal in one part of a catchment may well affect river water quality at a downstream water abstraction point in the same catchment, thus raising water treatment costs at that point—and in some cases possibly precluding abstraction. It is preferable, therefore, for the same agency to manage both effluent disposal and water abstraction locations and operations in order to minimize costs. In economists' terms, river basin management is an attractive way of "internalizing externalities."¹² The main difficulty with establishing river-basin agencies is that existing governmental agencies are usually required to surrender part of their jurisdiction and powers to "outside" interests, thus forcing defensive reactions in favor of the status quo. Also river-basin agencies add complexity to the overall political system.

Integrated Management of Water Functions

The success of catchment-based water management often depends upon the extent to which the river-basin agency is legally empowered to manage more than one primary water function within a given region. Thus, there may be uni-functional and multi-functional basin agencies, but where economic and social development is advanced, and demands upon water and associated land resources are multifarious, a multi-function "integrated" approach is often advantageous. Conflicts inevitably arise between water functions, such as between power generation and recreation.

8. E.g. E. Porter, *supra* note 5; D. Parker & E. Penning-Rowell, *supra* note 5, at 85-86; E. Penning-Roswell, D. Parker & D. Harding, *Floods and Drainage: British Policies for Hazard Reduction, Agricultural Improvement and Wetland Conservation* (1986).

9. P. Herrington, *Pricing of Water Services* (1985) (Paper presented for OECD Environment Committee Steering Group on Economic Aspects of Water Conservation).

10. White, *A Perspective on River Basin Development*, 22 *Law & Contemp. Probs.* 157 (1957).

11. *Environmental Effects of Complex River Development* (G. White ed. 1977).

12. A. Kneese & B. Bower, *supra* note 5, at 97-129.

It may be argued that multi-functional agencies are in the best position to reconcile these conflicts by coordinating provisions for each function. Thus, in advanced economies the benefits of river-basin management are most likely to be achieved when water management is also multi-functional. However, separation of functions is sometimes held to be superior to integrated multi-functional management. Thus, where sewage disposal and pollution control are at issue, it may be argued that the water environment is best safeguarded if these functions are managed by separate agencies—one being able to prosecute the other for pollution offenses.

Adequate Legal Powers

Water management comprises a number of functions including data collection and monitoring, planning, development, design and construction, operation, and regulation. There is considerable variation, however, in the extent to which water agencies at different levels of government have adequate legal powers at their disposal to undertake each of these functions.¹³ As society develops, becomes more complex, and becomes more demanding of natural resources such as water, one could expect the regulatory framework and incentive systems for efficient use to be developed progressively through legislation. For example, the ability of water management agencies to regulate groundwater withdrawals is often dependent upon legislation imposing a groundwater withdrawal licensing system with powers to refuse permits where groundwater resources are being depleted. Similarly, the ability of water agencies to operate economically efficient water supply charging systems depends upon these agencies being legally empowered to install water meters.

Adequate Finance

Inadequate financing for water management is often the cause of failure to improve, or delay improving, standards of water service. Financial constraints may lead to deterioration in standards, and thus there is interplay between criteria. For example, the ability of water agencies to safeguard the environment is often related to financial constraints. The quantity of financial resources available to water agencies depends upon many factors. For example, adequate legal powers must exist to raise revenue through charges, and to borrow. Water agencies should be large enough to be able to finance large-scale water resource developments where such are required. They should also be able to subsidize the provision of nonmarketable environmental services, such as pollution control and recreation and amenity, from marketable ones. Government economic policy may control public sector expenditure, perhaps setting expenditure

13. L. Craine, *supra* note 3.

ceilings and rate of return requirements upon water agencies. In some instances private sector finance may have an important role in providing water services.

Economic Principles

The economic perspective on water management is based on the recognition that providing water when and where consumers demand it usually requires the use of economic resources. Therefore water is an economic good. This perspective thus subsumes the concepts of economic efficiency, consumer sovereignty and utility maximization.¹⁴ Thus, economic systems are designed to allocate resources in an economically efficient manner. Economic instruments should therefore be designed to answer questions such as: what goods and services should be produced; what quantity and quality of these goods and services (including environmental ones) should be produced; and for whom should they be produced? Furthermore, it is argued that water should be managed to maximize its net value in use, and allocation decisions should be left to "sovereign" consumer's preferences.¹⁵

In most countries, water legislators and managers are seeking ways of applying such economic principles to water management to ensure the efficient conservation, management and allocation of water services. There is, however, widespread recognition that the application of economic principles does not, in itself, provide total solutions to problems which must also involve social and political choices.

Testing for the sound application of economic principles involves investigating whether current resource allocation methods are economically efficient and whether they are based upon utility maximization and consumer preferences. This leads to analysis of charging structures and whether they encourage efficient resource allocation and whether, for example, marginal cost pricing of water services is used. This line of analysis leads to investigation of the degree to which water is charged for by volume consumed, whether there are economic incentives to avoid waste, and the extent to which the polluter is made to pay for pollution damage. One may also ask whether projects and other water related investments are appraised against economic efficiency criteria, as is sometimes done in the use of benefit-cost analysis of water supply extension, flood mitigation, and pollution abatement projects.

Equitable Policies

Equity (or fairness) is a highly subjective concept. All definitions of equity reflect a value judgment and the adoption of a political standpoint.

14. J. Rees, *Natural Resources: Allocation, Economics and Policy* (1985).

15. P. Herrington, *supra* note 9.

The equity issue concerns whether or not water should be "socially" priced (or subsidized) to ensure that its use is not inhibited by income considerations, or whether or not water management should be a vehicle for directing financial help to the poorer members of the community. Thus, the equity issue is bound up with "income distribution" issues. Where equity issues are concerned there are no right or wrong answers, only social "political" choices. Thus, a "welfare state" water industry model might well lead to subsidized water services, whereas a business corporation model leads towards removing the responsibility of income redistribution from the water industry and towards other government policies, such as social security and taxation systems.¹⁶

A variety of definitions of equity are possible. For example, water service charges may be fixed according to at least three different equity definitions. First, consumers can all be charged the same price for consuming a single unit of water. At first sight this appears equitable but some consumers may place a higher cost upon the supply system than others—which might be interpreted as inequitable. This leads to a second definition of equity: consumers pay according to the cost which they place upon the water supply system. Arguably, however, this is also unfair since consumers living in say, peripheral rural regions, may place a higher cost on water services than those living in central urban regions. A third possibility is that consumers should pay according to their wealth. Thus, the well-off would pay more than the less well-off.¹⁷

The presence of income redistribution objectives within water policy suggests an underlying equity goal. Charging structures may be analyzed to determine whether or not they lead to inequity, however defined. A different test of the equity of institutions or policies concerns whether or not particular groups or individuals are arbitrarily or consciously discriminated against in terms of water charges, or the provision of services. Conflicts often arise between the search for ways to apply economic principles and the search for equitable policies, since what is equitable is not always economically efficient. It is the balance which is struck between these competing criteria which is of particular interest.

Environmental Protection

The water industry is not only concerned with the protection of the aquatic environment but other environmental resources, such as landscape, which is impinged upon by water management. An important test of water management institutions is the degree to which they safeguard and protect environmental values, recognize the limitations imposed by environmental considerations, and seek to modify, and sometimes, reject

16. *Id.* at 14.

17. D. Parker & E. Penning-Rowsell, *supra* note 5, at 85-86.

policies which have adverse environmental impacts. The extent to which environmental interests are represented, consulted and internalized within the decisionmaking process, how far environmental impacts are taken into account in development decisions, and whether environmental impact techniques are employed, are all important measures together with the more objective indicators of environmental quality improvement or decline.¹⁸

Public Accountability

Public accountability in water management is becoming progressively more important as water management develops from being not only a technical issue but a key ingredient in economic and social policy and influenced more and more by political considerations.¹⁹ Accountability is the cornerstone of democratic government. In democracies the most important test of accountability is the degree to which decisionmakers—in this case, water managers—are directly or indirectly answerable to the electorate. A further test of accountability is the extent to which all relevant interests are represented and involved in the planning process. Previous research has either explicitly emphasized accountability²⁰ or has dealt with it more implicitly through recognition of the need for institutions to be responsive to changing social values and needs.²¹

There are many different forms of accountability ranging from direct to indirect and local to central. Essentially, accountability is a political mechanism and is one very important means by which representations and decisions are made over spending. Often water managers prefer technical considerations to dominate in decisionmaking. Thus, a strong system of public accountability can interfere with the technical rationale and cause frustration at the technical planning level. Therefore, public accountability and technical efficiency sometimes conflict with each other and it is the particular balance that is struck within any institutional system which is crucial.

The Integrated Management of Water and Other Areas of Government Policy

Ideally, different areas of government policy should be integrated so that they work towards the same objective rather than negating or jeop-

18. E. Penning-Roswell, D. Parker & D. Harding, *Floods and Drainage: British Policies for Hazard Reduction, Agricultural Improvement and Wetland Conservation* (1986).

19. W. Sewell, J. Handmer & D. Smith, *supra* note 5, at 244.

20. J. Rees, *supra* note 13; E. Porter, *supra* note 5; A. Maass, H. Hufschmidt, R. Dorfman, H. Thomas, S. Marglin and G. Fair, *Design of Water-Resource Systems: New Techniques for Relating Economic Objectives, Engineering Analysis, and Governmental Planning* (1962).

21. L. Craine, *supra* note 3; L. Barr, *supra* note 4; C. Howe, *The Design and Evaluation of Institutional Arrangements for Water Planning and Management* (1971) (Paper presented at United Nations Conference, Mar del Plata, Mar. 24-25).

ardizing each other.²² There are many areas of interface, for example, between agricultural policy and water policy. As an illustration, unless coordination takes place, agricultural policy on the use of fertilizers and pesticides to increase agricultural profitability may work against water policy designed to improve river water quality. Urban land-use development has major ramifications for the quality of urban watercourses. Methods of policy coordination are clearly required. Similarly, flood hazards are worsened by ill-advised flood plain development. Again a system of coordination between flood mitigation and urban development agencies is needed to reduce this problem. A key question is, therefore, the extent to which the key interdependencies between water and other government policies have been recognized, and the extent to which, in consequence, policies are modified and management tools developed to encourage policy integration.

POLICY EVOLUTION: 1963-1986

The present institutional framework for water management in England and Wales has its roots in the 1963 Water Resources Act [1963 Act] and the 1973 Water Act.²³ The 1963 Act followed to varying degrees the recommendations of the Central Advisory Water Committee [Committee], which was set up in 1955 to review water policy. The Committee recognized several important weaknesses in existing institutions, including the fragmentation of the water industry into thousands of small management units, and consequent difficulties arising from lack of coordination among agencies.²⁴ Coordination problems were of particular concern because of the growing scarcity of clean water sources close to major urban areas. The Committee recommended a new approach embracing a consolidation of agencies, the introduction of economic concepts into water policy, and the development of a national water policy.²⁵

The 1963 Water Resources Act was based broadly upon these principles which also sowed some important seeds of change which finally brought about the 1973 Water Act. The 1963 Act failed to accomplish a major consolidation of agencies. Administrative structures in fact changed remarkably little. Although the number of water agencies was marginally reduced, 1,597 agencies remained involved in the management of the principal water functions. Most significantly, the 1963 Act left control of the water industry in local government hands and continued the separate management of sewage disposal and water supply functions. The former continued as a local authority function, while the latter remained in the

22. A. Kneese & B. Bower, *supra* note 5; B. Mitchell, *Geography and Resource Analysis* (1979).

23. 1973 Water Act, ch. 37.

24. Gr. Brit. Central Advisory Water Committee, *The Future Management of Water in England and Wales* (1971).

25. E. Porter, *supra* note 5, at 25.

hands of statutory water undertakings (local authority agencies or private water companies).²⁶

The main success of the 1963 Act lay in the highly significant change of emphasis from single-purpose water management to a more integrated approach, in which some of the most important water functions were performed by the same catchment agency. Thus, the Act established 29 River Authorities with similar catchment boundaries to the 34 River Boards which they replaced (Table 1). However, in addition to land drainage

TABLE 1
Key Events in the Evolution of Water Institutions in
England and Wales Since 1959

Date	Key event	Institutional response
Oct 1959 1963	Conservative govt. elected	Water Resources Act passed 29 River Authorities; 370 Statutory Water Undertakings; 1327 local authority sewage disposal authorities; Water Resources Board created
Oct 1964 1965	Labor govt. elected Water Resources Act 1963 implemented	
May 1966 1969	Labor govt. re-elected	Central Advisory Water Committee re-established
June 1970 1971	Conservative govt. elected	Central Advisory Water Committee report
1973 1973		Water Resources Board publishes national water strategy (25) Water Act passed 10 Multi-functional regional Water Authorities (WAs); recreation function added. 32 Water Companies (water supply function); National Water Council and Water Space Amenity Commission created

26. Sewell & Barr, *Evolution in the British Institutional Framework for Water Management*, 17 *Nat. Res. J.* 395 (1977).

TABLE 1 (continued)

Date	Key event	Institutional response
1974	Water Act 1973 implemented	
Feb 1974	Labor govt. elected	
1974	Implementation of COPA delayed	Control of Pollution Act (COPA) passed
1976		Government consultative proposals (37) for a National Water Authority; integration of private Water Companies with public sector Water Authorities*; increase in local authority membership of WAs; water charges equalization proposals
1977		Government decision to implement 1976 proposals* except for integration of Water Companies. Water Charges Equalization Act passed
May 1979	Conservative govt. elected	
1979	Self-financing directive to WAs	
1980		Internal reorganization of WAs commences
June 1983	Conservative govt. re-elected	
1983		Water Act passed. National Water Council and Water Space Amenity Commission dissolved. Water Charges Equalization Act repealed. Consumer Consultative Committees introduced WA board membership substantially reduced
1984	Annual rate of return set for WAs by Minister	
1985	Review of land drainage administration announced	
Feb 1986	Control of Pollution Act 1974 implemented	10 Water Service Public Limited Companies to be created; Special Public Bodies for land drainage function
July 1986	Government announces postponement of privatization plans until after next general election	
1987– July 1988	General election announcement awaited.	

*Proposals/decisions subsequently abandoned.

(flood alleviation and agricultural drainage), pollution prevention, fisheries and navigation functions held by the River Boards, the new River Authorities were given powers relating to water conservation, development, abstraction and forward planning. Under the 1963 Act, the River Authorities were required to expand data collection, produce long range assessments of future water supply and demand trends, introduce charging schemes for financing water resource development, and license water abstractions. In addition, the 1963 Act established a national Water Resources Board responsible for advising central government and the main water agencies.

At the central government level a basic separation of responsibility for national water policy between the local government Ministry (the Ministry of Housing and Local Government which became the Department of the Environment in 1970) and the agriculture Ministry (the Ministry of Agriculture, Fisheries and Food) was consolidated by the 1963 Act. The agriculture Ministry retained control of land drainage (including flood alleviation) and fisheries, while all other water functions became the responsibility of the local government Ministry.

The 1963 Water Resources Act did not go far enough in consolidating water management units. The major flaw—the continued separate management of the “dirty” (sewage disposal) and “clean” (water supply) sides of the water cycle—quickly surfaced during the late 1960s as a major continuing coordination problem. The issue was exacerbated by the increased reliance upon “dirty” lowland river sources as new “clean” upland sites for water storage became increasingly difficult to find, owing in part to the increasing public concern about adverse environmental and social impacts of reservoir developments.

The separation of powers for pollution control and sewage disposal severely limited effective water quality management which was a major option in the search for new clean water sources. The national water strategy published by the Water Resources Board in 1973²⁷ was excessively constrained by lack of attention to the potential of water quality management to solve water supply problems.²⁸ Instead, the Board produced a plan which foresaw major water supply extension projects—a plan soon to be shelved following the government’s re-establishment of the Central Water Advisory Committee in 1969 whose purpose was to review institutional arrangements once again. The 1971 report of the Central Advisory Water Committee set out several options for institutional reform, including the further consolidation of water agencies.²⁹

27. Gr. Brit. Water Resources Board, 2 *Water Resources in England and Wales* (1973).

28. See L. Craine, *supra* note 3.

29. Gr. Brit. Central Advisory Water Committee, *supra* note 24, at 295-314.

During the late 1960s further deficiencies of the institutional arrangements became apparent.³⁰ The continuation of numerous small management units constrained the achievement of economies of scale and economic efficiency in water management. In addition, water-based recreation grew rapidly, especially at inland sites. Apart from permitting the usage of a number of water supply reservoirs for recreation, however, River Authority responsibilities for recreation and amenity developments remained limited.

The 1973 Water Act: The "Revolution" in Water Management

The 1973 Water Act has been called a "revolution" in water management in England and Wales.³¹ The Act established 10 Regional Water Authorities—later known just as Water Authorities: nine in England and one in Wales. The "revolution" lay in the "overnight" consolidation of the functions of approximately 1500 management units into these 10 Water Authorities on April 1, 1974 (Table 1). The Water Authorities replaced the River Authorities and unified the management of the water cycle—this time including the "dirty" and "clean" sides of the cycle. Some 32 (now 28) private water companies were retained as single function water supply agencies, providing about 22 percent of water supplies, yet these companies became "agents" of the Water Authorities³² (see Figures 1 and 2).

Thus, the Water Authorities became regional-scale, river-basin-based, multi-functional water management agencies operating on a "source-to-mouth" management principle. Water Authority boundaries comprised consolidations of former River Authority areas: no concession was made to political pressures from Wales for an entirely "Welsh" Water Authority.³³ Thus, following the hydrological imperative, the Welsh Water Authority's area excluded a major part of mid-Wales lying in the river Severn catchment which came under the jurisdiction of the predominantly "English" Severn-Trent Water Authority. Water Authorities are responsible for all of the water functions which are important in England and Wales: water resource conservation, water treatment and distribution, sewerage, sewage treatment and disposal, water quality regulation, pollution control, river management including flood alleviation and land drainage, recreation and amenity, fisheries, and navigation. Within each Water Authority a corporate management structure was established com-

30. Gr. Brit. Water Resources Board, *supra* note 27..

31. D. Okun, *supra* note 5, at 16.

32. D. Parker & E. Penning-Rowell, *supra* note 5, at 35-36.

33. Broady, *Welsh Water: The Politics of Water Supply*, in *Water Planning and the Regions*, 9 Disc. Paper 19 (P. J. Drudy ed, Regional Studies Association 1977).

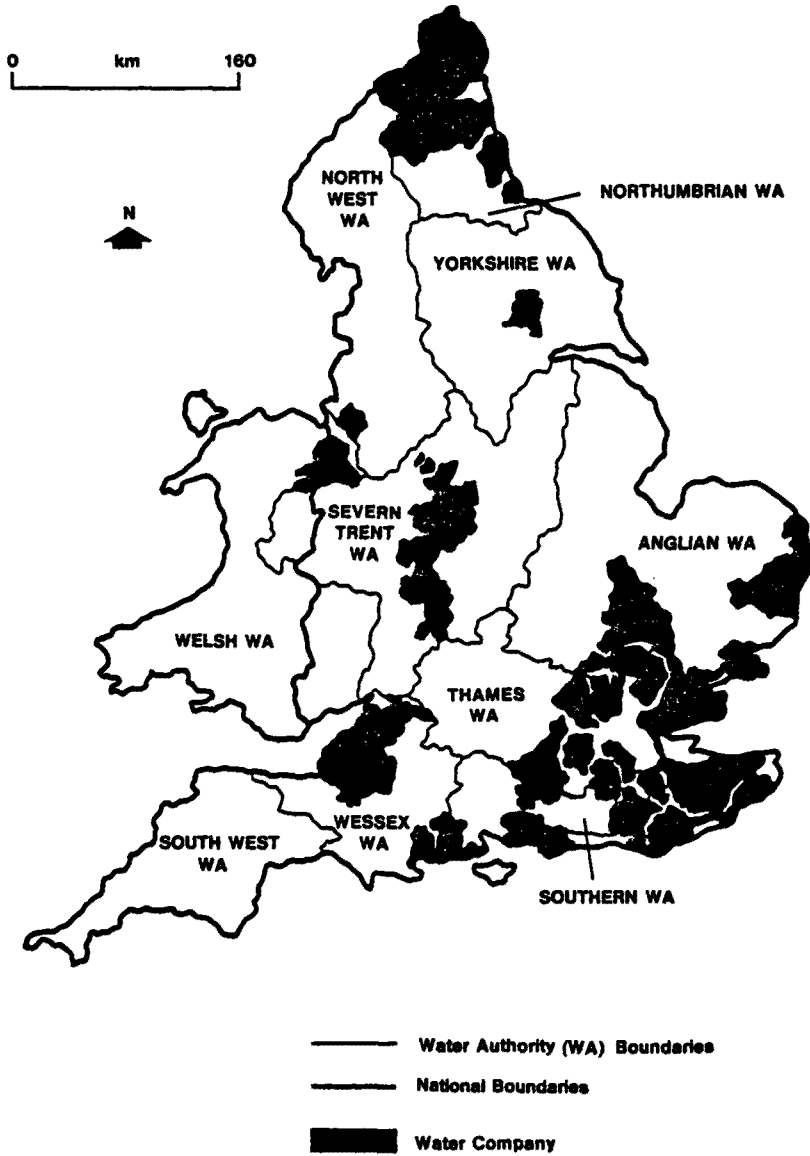


FIGURE 1. The Catchment-based Water Authorities and the Water Companies in England and Wales

Source: D. J. Parker and E. Penning-Rowcell, *Water Planning in Britain*, 26 (1980).

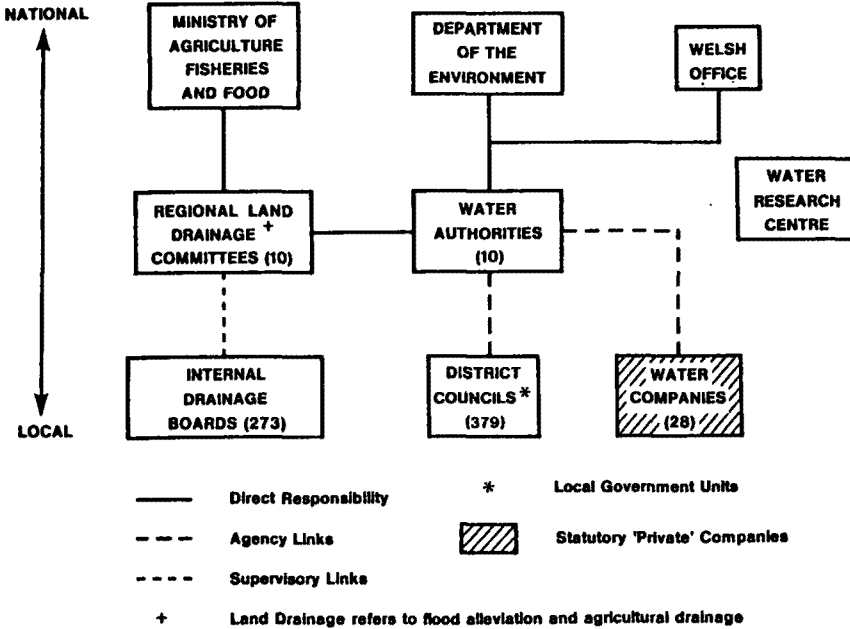


FIGURE 2. The Principal Water Management Agencies in England and Wales

prising a team of headquarter directors responsible for overseeing operations at the divisional (sub-regional) level.

The 1973 Water Act replaced the Water Resources Board with the National Water Council, composed of the Chairmen of the 10 Water Authorities together with appointees from the central government. The National Water Council was an advisory body both to government and to the water industry but did not have the research and planning functions of its predecessor which went to the Central Water Planning Unit and the Water Research Centre. In addition, to help push the water industry into its new recreation and amenity role, the Water Space Amenity Commission was established to promote the development of water-based recreation.³⁴

A major feature of the April 1, 1974 water reorganization was the removal of water management from local government. While each Water Authority was given an executive board of up to 52 members, the majority of whom were local authority appointees, water management was no longer a local government function. Significantly, the financing of water

34. Gr. Brit. Water Space Amenity Commission, *Who We Are and What We Do* (1977).

management was separated from local government.³⁵ The Water Authorities inherited huge debts. No longer were water rates (that is charges) subsidized by the local authority rate support grant from the central government—a change, which together with a move towards self-financing, forced up water charges.³⁶

Amid the “revolution” one unchanging anomalous feature of water management in England and Wales since 1930 can be recognized. The 1973 Water Act did not alter the overall “control” of land drainage by the Ministry of Agriculture, Fisheries and Food (MAFF). While the Water Authorities were given supervisory, maintenance and construction powers relating to land drainage, the executive responsibility for administering land drainage finance was delegated in the 1973 Act to Regional Land Drainage Committees and their local counterparts,³⁷ thus maintaining control of “agricultural drainage” (though urban drainage and flood alleviation was included) in the hands of landowners and farmers who made up the membership of these Committees. In England and Wales, central government grant aid subsidy was given to farmers for drainage improvements in low-lying land with wet soils to enhance agricultural profitability. The rigid defense of the *status quo* and the drainage subsidy system by agricultural interests throughout the passage of the Water Bill through Parliament is a story in its own right.³⁸ Despite attempts to loosen the control of agricultural interests over this aspect of water policy and to concentrate central government responsibility for water policy in the Department of the Environment, the “community network” of mutually supporting agricultural interests—an alliance termed “the MAFFia” by their opponents—campaigns successfully to retain a distinctive administrative system for land drainage.³⁹

The 1973 Water Act brought about more than just a “revolution” in administrative and organizational structures. The Act reflected political moves to reduce the “welfare state” systems of collective provision and finance. In part, this reflected a fundamental economic change in Britain in the late 1960s and 1970s associated with the declining profitability of the nation’s traditional industrial base, an aging population profile, and questions about the affordability of “welfare state” services in the latter part of the century. Thus, the Act initiated changes which have profoundly affected the nature of the relationship between the water industry and its

35. Gray, Regional Water Authorities, in *Regional Government in England* (B. Hogwood and M. Keating eds. 1982); Gray, *Organisational Contingency and Water Authority Structure*, (Middlesex Polytechnic Geography and Planning Paper 3).

36. D. Parker & E. Penning-Rowsell, *supra* note 5, at 84.

37. E. Penning-Rowsell, D. Parker, & D. Harding, *supra* note 18, at 35-37.

38. See A. Kneese & B. Bower, *supra* note 5.

39. Richardson, Jordan & Kimber, *Lobbying, Administrative Reform and Policy Styles: The Case of Land Drainage*, *Political Studies* 47 (1978).

clients. The Act moved the industry towards the philosophy of water as an economic good rather than as a subsidized public health service. The Act was based upon a managerial philosophy, upon a philosophy that "bigger is better" and upon increased administrative efficiency and greater economic efficiency—in short, upon "business" imperatives.⁴⁰

1974 to 1979 and the Water Industry Review

The 1973 Water Act gave Water Authorities important water quality regulation and nature conservation duties. Significantly, these were backed up in the 1974 Control of Pollution Act,⁴¹ known as "COPA," Part II of which covers water pollution. Apart from significantly tightening the control of polluting discharges to sewers and watercourses, through the establishment of public registers recording pollution "consent conditions," the Water Authorities are themselves open to public criticism and prosecution where their sewage treatment works fail to meet consent conditions approved by the Secretary of State. However, although COPA passed through Parliament in 1974, the implementation of major sections of the Act was phased, and Part II was still not completely implemented by 1986. Because of the additional pollution control expenditures necessary for the Water Authorities and industry to comply with the Act, the latter was viewed as inflationary during a period when counter-inflation policy was a major government priority. In addition, the implementation delay allowed Water Authorities to "adjust" their sewage treatment works' consent conditions so that they could avoid embarrassing criticism and prosecutions.⁴²

The 1974 to 1979 period witnessed proposals for further institutional change in the water industry. However, with the exception of the 1977 Water Charges Equalization Act,⁴³ few of these reforms actually materialized.⁴⁴ This period demonstrates the growing tendency since the late 1960s for the water industry to be pulled to the center of the political arena, with institutional proposals increasingly reflecting the progressively polarizing economic and political ideologies of the conservative and labor parties.

The 1973 Water Act was introduced by a conservative government but in 1974 a labor government was re-elected and remained in office until 1979 (Table 1). On gaining office the new government announced a full

40. Penning-Rowse & Parker, *The Changing Economic and Political Character of Water Planning in Britain*, reprinted in *4 Progress in Resource Management and Environmental Planning* (T. O'Riordan & R. Turner eds. 1983).

41. 1974 Control of Pollution Act, ch. 40.

42. National Water Council, *River Water Quality: The Next Stage: Review of Discharge Consent Conditions* (1978).

43. 1977 Water Charges Equalisation Act, ch. 41.

44. D. Parker & E. Penning-Rowse, *supra* note 5, at 86-87.

review of the water industry in England and Wales. This review was published as a consultative document in 1976 inviting public comments.⁴⁵ The labor government's proposals⁴⁶ reflected traditional labor party concerns: a preference for state control through central authority with a national strategy; devolution to the provinces; dislike of the private water companies; local representation and accountability; and equity.

Accordingly, the government's proposals included the establishment of a National Water Authority to replace the National Water Council, the Water Research Centre and the Central Water Planning Unit, and the development of a national strategy for water services. No specific changes were proposed to the functions or the boundaries of the Water Authorities. However, a new Welsh Assembly was to be responsible for water policy in the whole of Wales and local accountability and representation was to be strengthened with a 20 percent increase in local authority membership of Water Authority boards. In the end the proposal that the private water companies were to become state-owned was dropped. With the dramatic rise in water charges during the mid-1970s wide variations in average water bills for unmeasured, mainly domestic, supplies developed between Water Authority regions. For example, in 1976 household water supply bills ranged from 44 percent above the national average to 17 percent below this average.⁴⁷ Although these variations in part reflected different historic debts faced by Water Authorities, they were considered unfair and thus water charges were to be "equalized."

The only major institutional reform to materialize before the general election of May 1979 was the passing of the 1977 Water Charges Equalization Act. The intent of this legislation was for water consumption in high-cost areas such as Wales to be subsidized by low-cost areas, such as the Thames region, where "equalization levies" appeared on water bills. Difficulties were experienced, however, in operating the 1977 Act and it was repealed by the conservative government in 1983. The labor government's proposals to take the private water companies into state ownership also foundered following a strong rearguard action by the companies and the large amounts of compensation that it was claimed would be necessary to integrate the companies with the public sector Water Authorities. The regional devolution movement of the 1970s dissipated towards the end of the decade as proposals for Welsh and Scottish Assemblies gained little public support.

During the labor government administration, public sector investment

45. Department of the Environment and Welsh Office, *Review of the Water Industry in England and Wales: A Consultative Document* (1976).

46. Department of the Environment, Welsh Office and Ministry of Agriculture, Fisheries and Food, *The Water Industry in England and Wales: The Next Steps* (1977).

47. D. Parker & E. Penning-Rowsell, *supra* note 5, at 83-84.

in the water industry declined markedly, not least because of the reductions in public expenditure which were forced in 1977–78 by the intervention of the International Monetary Fund.⁴⁸

1979–1983: The First Thatcher Government and the 1983 Water Act

The main thrust of the conservative government led by Margaret Thatcher has been to continue the transformation of the water industry in England and Wales from a public service to a business organization⁴⁹ ripe for return to the private sector in what the present government hopes will be the third Conservative administration of the 1980s.

The basis for achieving this goal was laid in the 1973 Water Act which removed the industry from local political control and introduced the corporate management approach and search for efficiency. The Act set up large Water Authorities capable of achieving significant economies of scale, removed subsidies from water charges. The Act also made it possible to introduce a self-financing directive for Water Authorities, incorporated a clause by which Ministers could require Water Authorities to earn a fixed rate of return on operations, and made it legally feasible to introduce domestic water metering to enable economic principles to be applied to water charging. From the end of 1979 onwards the water industry came under “external” government-imposed pressures designed to achieve the conservative government’s economic policy goals. In many respects these pressures were more important than legislation in generating institutional change.

The first of these pressures has been the Thatcher government’s monetarist economic policy. This has demanded the continued curbing and cutting of public expenditure and the public sector borrowing requirement so that inflation may be contained. Also, to arrest the declining profitability of British industry, the Thatcher government’s philosophy has been to shift the balance of the country’s capital investment away from the seemingly “unproductive” public services towards more “productive” private industrial capital investment. The second pressure has been “cash planning” and the setting of expenditure ceilings for the public sector, a device to control overspending. By 1981 public sector investment in the water industry in England and Wales had returned to the 1965–66 level⁵⁰ (Figure 3). Thirdly, from 1979 onwards the government began to progressively reduce the proportion of capital expenditure funded from bor-

48. Penning-Rowse & Parker, *supra* note 40, at 189.

49. See A. Patterson, *The Restructuring of Water Production and Consumption* (1987) (Paper presented at the Annual Conference of the Institute of British Geographers, Portsmouth, UK); Penning-Rowse & Parker, *supra* note 40, at 170.

50. Penning-Rowse & Parker, *supra* note 40, at 191.

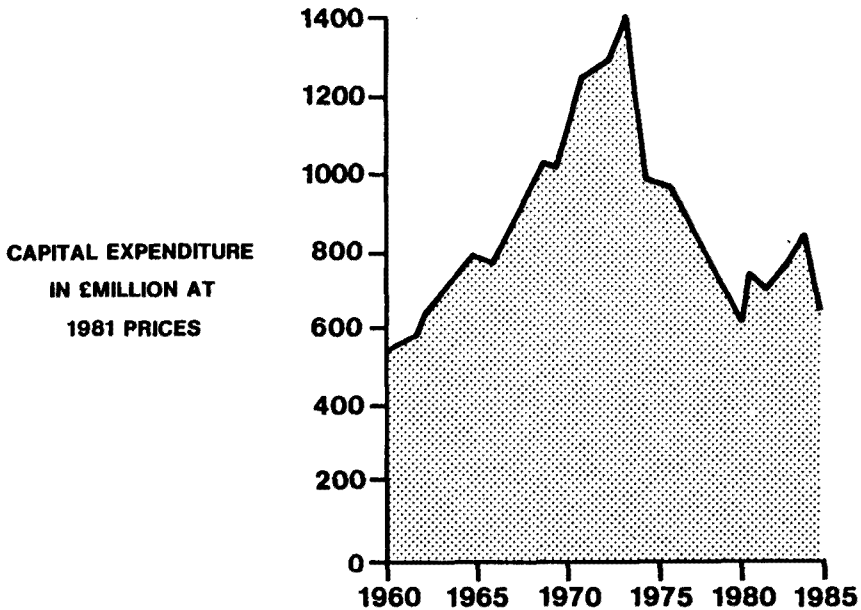


FIGURE 3. Water Authority Capital Expenditure 1960 to 1985

Source: Penning-Rowsell & Parker, *The Changing Economic and Political Character of Water Planning in Britain*, In *Progress in Resource Management and Environmental Planning 4* (T. O'Riordan & R. Turner eds. 1983); The Chartered Institute of Public Finance and Accountancy, *the Water Industry UK Service and Costs 1985* (1986).

rowing, with the intention of forcing Water Authorities towards financial self-sufficiency. This was later followed when the government required Water Authorities to earn a certain rate of return ("profit") on capital invested to generate revenue to more rapidly pay off government loans, thus again reducing the public sector borrowing requirement.

Further adjustments to institutional arrangements were made by the 1983 Water Act. Consistent with the conservative government's philosophy of improving administrative efficiency and tightening central government control over the water industry, the Act significantly reduced the size of English Water Authority boards to between ten and fifteen, and finally eliminated the requirement that local authority members be appointed.⁵¹ Instead Water Authorities were required to set up advisory

51. Kromme, *Regional Water Management: An Assessment of Institutions in England and Wales*, 37 *Professional Geographer* 183-91 (1985).

consumer consultative committees to include local government representatives and different classes of consumers.

Consistent with the conservative government's apparent dislike and abolition of many "quangos"—quasi-autonomous nongovernmental organizations—under the 1983 Water Act⁵² the National Water Council and the Water Space Amenity Commission were also dissolved, removing the national level advisory tier of agencies set up under the 1973 Water Act. Instead, the Water Authorities Association, a kind of "trade association" or water industry pressure group comprising the Water Authority chairmen, was set up.

Also, during the 1979–83 period Water Authorities underwent major internal reorganizations designed to streamline their administration, reduce staff levels by up to 30 percent thereby paring costs, and introduce business management techniques and retraining. To encourage comparison and efficiency, in the early 1980s the government also required Water Authorities to regularly produce "performance indicators" at constant prices for each of their services. Thus, performance targets or levels of service could be incorporated into Water Authority plans.

During this period the conservative government sought a low profile on environmental protection issues which were perceived as a force for greater public expenditure. Thus, implementation of COPA Part II was further delayed. Paradoxically, however, the water industry's duties for environmental protection expanded during the early 1980s not least through the enactment of the 1981 Wildlife and Countryside Act⁵³ which lays additional environmental protection duties on Water Authorities.

1983–1986: The Second Thatcher Government and Plans for Water Industry "Privatization"

The latest period of change has been particularly turbulent. Arguing that board meetings closed to the press are more efficient, in 1984 the Water Authorities closed their meetings to the public. Internal reorganization of Water Authorities has continued apace, pressures for investment and replacement of aging plants and equipment, particularly sewers and water mains, have grown, yet real capital expenditure has been pegged at about 1979–80 levels⁵⁴ (Figure 3). Pressures mounted from the European Commission for water quality control expenditures for United Kingdom compliance with the 23 European Community "water directives."⁵⁵

52. Water Act, 1983.

53. Wildlife and Countryside Act, 1981.

54. The Chartered Institute of Public Finance and Accountancy, *The Water Industry UK Service and Costs 1985* (1986).

55. N. Haigh, *EEC Environmental Policy and Britain* (1984).

During 1985 the chairman of the Thames Water Authority became the principal water industry proponent of "privatization." He objected to the government's continued interference in his Authority's affairs, especially the government's financial policies. These policies, designed to finance more capital investment from water charges, imposed an increase in water charges more than double that required by the Thames Authority. After a period of intense speculation and uncertainty, in February 1986 the conservative government announced its plans to "privatize" the Water Authorities in England and Wales.⁵⁶ These privatization plans are part of the Thatcher government's commitment to a private market philosophy affecting British Airways; the gas, post office and telecommunication industries, nationalized banks, hospitals and health care, and education. The government's privatization plans have received a mixed reaction from within the water industry but Water Authority chairmen antagonistic to the plans have been replaced.

The plan to privatize the water industry envisages a progressive £6000M stock market "flotation" of the Water Authorities, possibly beginning with Thames Water Authority. The Water Authorities will become Water Service Public Limited Companies operating within a regulatory framework (Figure 4).

Integrated river basin management will be retained, although controversial separate institutional arrangements are being debated for the administration of land drainage, flood prevention and coast protection.⁵⁷ Consistent with the application of economic principles to water management, large-scale domestic water metering is being studied and detailed metering trials are being undertaken. Universal domestic metering is now more probable since the government intends to reform the local rating system, currently the basis for calculating charges for unmeasured public water supplies.

POLICY EVALUATION

The evolution of water institutions in England and Wales between 1963 and 1986 has been more dramatic than in most countries. The extent to which river basin management has been adopted is of world-wide interest. It is therefore highly pertinent to evaluate the extent to which institutional arrangements have succeeded. The nine evaluative criteria noted earlier are employed here.

56. See Secretary of State for the Environment, *Privatisation of the Water Authorities in England and Wales* (1986); Department of the Environment and Welsh Office, *The Water Environment: The Next Steps* (1986) (The Government's Consultative Proposals for Environmental Protection Under a Privatised Water Industry); Sewell, *The Continuing Saga of British Water Management: "Privatization Shelved,"* *Water News* 2, 3-5 (1987).

57. Ministry of Agriculture, Fisheries and Food, *Financing and Administration of Land Drainage, Flood Prevention and Coast Protection in England and Wales* (1985).

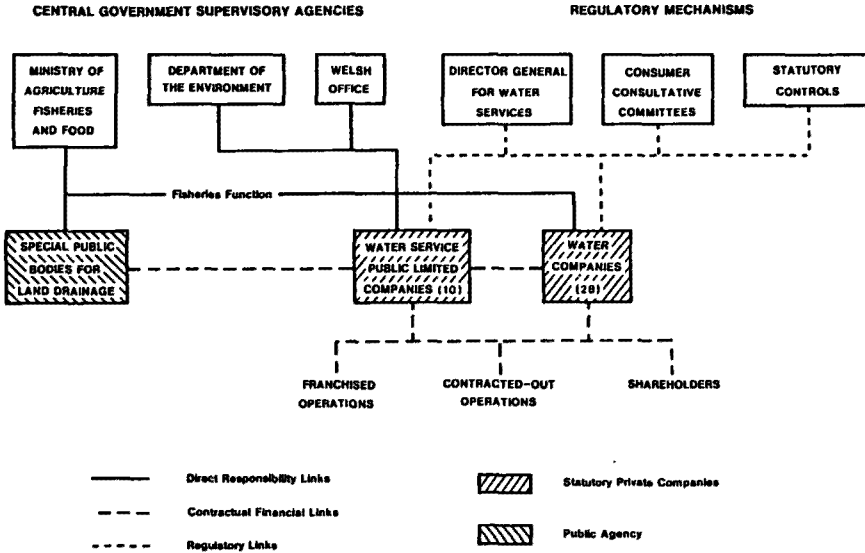


FIGURE 4. The Future Shape of the Water Industry in England and Wales under the Government's "Privatization" Plans

Source: Derived from Secretary of State for the Environment, Privatisation of the Water Authorities in England and Wales (1986).

A Broader Perspective

During the past two decades, water management in England and Wales has been transformed into a progressively broader field of activity. Similar trends have been noted elsewhere.⁵⁸ Not only have the responsibilities of water management agencies expanded but the environmental implications of water management have become more clearly recognized. Water management has become a more clearly political activity, not just because it is distributive. As we have seen, water management has become progressively more affected by wider economic policies and ideological issues.

The broadening of water management has necessitated a major change in the professions represented among water managers. The narrow traditional technical, engineering and water science basis of water management has been replaced by one in which business executives, accountants, and economists dominate. In England and Wales "technical" consider-

58. See, e.g., W. Sewell, J. Handmer & D. Smith, supra note 5.

ations still dominate decisions, but increasingly these decisions now embrace economic and financial considerations.

These transformations have generated a consideration of a wider range of options for solving water management problems. The potential of the social sciences is now being recognized, if not always consciously so, within the water industry. Technical, constructional options have been complemented, and in some cases replaced, by economic and social ones which are often more effective and cheaper to water agencies.

River Basin Management

Water management in England and Wales has benefited greatly from adoption of river-basins as the boundaries of the regional-scale Water Authorities. Importantly, the creation of river-basin agencies permitted the progressive separation of water management from local government. Before 1974, under local government control, water management suffered decades of insufficient attention and finance. In consequence, the Water Authorities inherited a seriously deteriorating sewerage and sewage treatment system which had been allowed to decline by local authorities more intent on spending public money on the more "attractive" vote-winning welfare services such as schools and housing. The creation of the Water Authorities allowed water managers to be "bosses in their own house," enabling a more rational and effective setting of priorities.

Although both the River Authorities, established by the 1963 Water Resources Act, and their successors, the Water Authorities, were river basin agencies, the latter are significantly fewer in number and larger in size than the former. Thus, the Water Authorities have been able to achieve economies of scale—notably in sewage treatment, water supply, administration, research and training—which their predecessors found difficult to achieve. The Water Authorities were also able, through their size and their capability, to manipulate the entire water cycle and to overcome two major droughts—in 1976 and in 1984. The flexibility of operation afforded to the water industry by its reorganization in 1974, and the security of supply created through regional water grids, provided considerable benefit.⁵⁹

River basin management has not, however, been adopted in totality in England and Wales. Although responsibility over some estuaries is divided between authorities thus complicating water pollution control there, the principal exception is the land drainage function. Areal jurisdiction for flood alleviation is divided between the Water Authorities who have powers and responsibilities for "main" rivers (the principal arterial rivers and their tributaries), and the local authority urban district councils who are

59. D. Parker & E. Penning-Rowsell, *supra* note 5, at 92-95.

responsible for "non main" rivers (the small, local, urban streams). Thus, in urban areas the responsibility for drainage is complex and the "source-to-mouth" planning principle is compromised. Similar complexity exists along the coastline where powers to mitigate sea flooding are divided among Water Authorities and local authorities.⁶⁰ These areal divisions of responsibility have led to coordination problems and "irrational" differences in standards of flood mitigation.

Integrated Management of Water Functions

The multi-functional approach established by the 1973 Water Act has contributed heavily to the successful adoption of river-basin management and vice versa. There is a general recognition that water management must often fulfill a range of competing demands, and that optimal use of resources is only attainable through simultaneous consideration of combinations of uses.

In England and Wales the major administrative and economic benefits of the multi-functional approach have come through the coordination of sewage disposal, water supply operation, and recreation and environmental protection on rivers. This has been achieved through the use of river quality objectives. On each reach of every river is set a river water quality objective—a quality standard to be met—according to the present and anticipated future uses of the water. Thus, sewage treatment plant and industrial discharge "consent conditions" for rivers are established according to an assessment of need, taking into account water abstraction and other uses, such as angling or wildlife. Furthermore, improvements in river quality according to need can be coordinated with the alteration of consent conditions and investments in improvement and renewal of sewage treatment plants in order to minimize water abstraction, treatment and supply costs. Thus, integrated management aids the targeting of investments and permits river water quality standards to be adjusted "up" or "down" according to judgments about need. However, while this promotes economic efficiency it does not always favor environmental improvement.

While the management of rivers is a major focus of the benefits of integrated management, such benefits also extend to other areas. The Water Authorities have extended the use of their reservoirs and gathering grounds to recreationists. Unfortunately, though, the extent of water industry-led recreational developments has been constrained because the majority of water space in England and Wales is in multiple private

60. E. Penning-Rowsell and P. Thompson, *Coastal Erosion and Flood Control: Changing Institutions, Policies and Research Needs* (1987) (Paper presented at the Annual Conference of the Institute of British Geographers, Portsmouth).

ownership. The benefits of integrated management are now being turned to the estuaries, where there are major pollution problems, and to the coasts where "bathing waters," as defined by the European Community, require substantial upgrading mainly for amenity purposes through major investments in sewage disposal.

Adequate Legal Powers

The progressive effect of the 1963 Water Resources Act, the 1973 and 1983 Water Acts, and the 1974 Control of Pollution Act Part II has been to provide Water Authorities with powers ranging over all water management functions. The extent to which these powers are "adequate," however, is a matter of much debate. Proposals for privatization have raised additional concerns in this respect.

Existing powers reflect progressive removal of private water rights and the establishment of the powers of the state to control, and enforce the control of, water withdrawals and polluting discharges. Through discharge consent conditions Water Authorities now have largely adequate and wide-ranging powers to regulate the discharge of industrial and trade pollutants and to make the polluter pay. Central government is, in turn, empowered to control the Water Authority's own discharges from sewage treatment works. Legal powers were implemented in 1986 to provide extensions to controls to virtually all types of discharge into water—riverine, coastal and estuarial. The powers of enforcement, including fines and imprisonment for offenses, have been strengthened under COPA.

Certain inadequacies in legal powers are identifiable. The protection of groundwater sources from diffuse and indirect sources of contamination is becoming a major problem requiring further legislation, possibly through the creation of limited water source protection zones. On another matter, although the 1973 Water Act permitted the Water Authorities to install water meters, further legislation is required to permit domestic water metering trials on a compulsory basis.

In England and Wales the major problems associated with legal powers lie in the problem of monitoring and enforcement and the flexibility which these powers afford. Monitoring and enforcement are labor-intensive processes and thereby problematic. The number of river pollution incidents is rising.⁶¹ Moreover, flexibility is a double-edged sword. While it enables Water Authorities to exercise discretion over say, the prosecution of polluters (where curtailment of pollution may be achieved instead by warning and persuasion), it also enables the government and Water Authorities, under severe financial pressures, to delay action. Government has been

61. Water Authorities Association, *Water Pollution from Farm Waste, 1985: England and Wales (1986)*; Department of the Environment and Welsh Office, *River Quality in England and Wales 1985: A Report of the 1985 Survey (1986)*.

criticized over long delays in the full implementation of COPA and, in turn, the flexibility this delay was designed to give the Water Authorities to adjust their discharge consent conditions has also been criticized.

An increasingly important dimension of legal powers is European Community (EC) water legislation which currently comprises 23 "water directives" concerning water quality.⁶² The United Kingdom government is obliged to comply with these measures and may be taken to the European Court if it fails to do so. The EC water directives will contribute to the raising of environmental standards in England and Wales. They have, however, received a mixed reception from government and the water industry for being "unnecessarily stringent" at a time of public expenditure restraint.

Finance

One of the major developing factors influencing water management from the 1974 reorganization onwards, was growing financial stringency. Initially this was a consequence of the removal of local government subsidy of water charges coinciding with a period of inflation. Subsequently, reductions in public expenditure, first by the labor government in 1978, and second through the conservative government's economic policy since 1979 of progressively reducing public expenditure, have forced radical reductions in Water Authority expenditure and investment. Expenditure ceilings, external financing (borrowing) limits and rate of return requirements have all significantly affected the availability of water industry finance.

Financial stringency has forced a continued search for increased administrative and economic efficiency. First since 1979 water supply charges have consistently risen at a rate greater than inflation. There is little doubt that the Water Authorities are now more efficient than previously. Second, the consequences for renewal and replacement of assets have been dire. The inherited derelict, aging sewers of the inner cities, the under-capacity, aging sewage disposal plants, and the aging water mains with growing leakage problems, have in many areas not received the investment required to keep pace with the problems. The Labour Party and water industry interest groups have repeatedly called for a major public works investment program to renew sewers, but these calls to reflate the economy have fallen on deaf ears. Through several reviews of discharge consent conditions, the Water Authorities have revised downwards the consent conditions of their sewage treatment works. There is continued high incidence of sewer collapse and sewage flooding and water wastage problems. Programs for dealing with complaints about public water supplies,

62. N. Haigh, *supra* note 55.

including discoloration, taste and odor, have been slowed down. Financial imperatives have delayed the implementation of COPA and other environmental legislation. Water quality is deteriorating as a result.

Economic Principles

Since the early 1970s water services have been viewed increasingly as economic goods. Unfortunately the movement of the water industry towards an economically efficient marginal cost pricing model for water commodities has been slow.

An important step was the removal of the rate support grant subsidy for water services following the 1974 reorganization. For the first time, consumers began to pay more realistic water supply costs, although water charges still varied according to the historic debts which Water Authorities inherited. Domestic water metering has been recommended as a means of improving efficiency. It has, however, been a source of frequent debate within the water industry. In April 1985, 99.56 percent of domestic water consumers still received unmeasured water supplies charged for according to the "rateable value" (an assessed property value based upon market rental value) of their houses.⁶³ Domestic water charges remain loosely related to consumption. There is only a weak correlation between rateable value and water consumption,⁶⁴ and domestic consumers have no economic incentive to control consumption or to avoid waste. From 1981 onwards the water industry introduced "option metering," by which domestic consumers pay for the quantity of water consumed, but only a small number of consumers have chosen this method of payment. The difficulties of moving away from a rateable value water charging system are considerable and progress awaits further legislation, metering trials and data collection. Universal domestic metering may still prove uneconomic but the water industry appears to be moving inexorably towards a major extension of domestic metering and charging volumes consumed.⁶⁵

Since the 1963 Water Resources Act, abstractors of water from rivers or aquifers have been licensed. From an economic viewpoint this licensing system is inefficient. The withdrawal of licenses where they are underutilized is not legally possible and quantities licensed cannot be re-allocated to more productive uses elsewhere. Where there is competition for abstraction licenses, and where industrialists are willing to pay more than existing license holders, licenses cannot be switched. Since 1969 licensed private water abstractors have been liable for an annual quantity charge.

63. Department of the Environment, *Joint Study of Water Metering: Report of the Steering Group (1985)* [The "Watts" Report].

64. D. Parker & E. Penning-Rowsell, *supra* note 5, at 186.

65. Department of the Environment, *supra* note 63, at 5.

These charges are related to the opportunity costs imposed by abstraction by different types of users. Since 1974 abstraction charges have risen and withdrawals have fallen markedly but this is probably explained more by economic recession and factory closure than by a response of demand to price increases.⁶⁶

The expense of separately measuring and charging for wastes produced by residential users of sewers is too great to warrant volume-related charges. Thus, sewerage and sewage disposal charges are usually made as standardized additions to water supply charges. Direct effluent discharges to rivers are controlled not through charges but through the imposition of standards by the setting of "consent conditions." The extent to which the standards approach leads to an economically efficient allocation of resources is questionable. Charges for industrial discharges into public sewers were introduced on a national basis in 1976, using a formula which agreed with industrial interests. However, the role of the charging system in increasing efficiency is unproven.⁶⁷ Currently, there are no charges for industrial discharges direct to watercourses. Even these place a pollution control cost on Water Authorities. The government believes that making the polluter pay for environmental damage caused by his effluent is too difficult to administer. Thus, a simpler cost recovery system is proposed for the future.⁶⁸

The pressure to ensure value for money from projects and investments has grown. Water Authorities are expected to assess investment programs according to conditions laid down for "nationalized industries": that is, a five percent real rate of return is to be achieved, and benefit-cost methods are to be employed in project appraisal. However, the Monopolies and Mergers Commission investigation of the Anglian and North West Water Authorities⁶⁹ found that for sewage projects benefit-cost appraisals suffered many shortcomings including exclusion of benefits, weaknesses in the development and appraisal of options and, in some cases, failure to cost options. A similar investigation of the Severn Trent Water Authority in 1981 revealed that there were technical deficiencies in the use of project appraisal methods and no systematic economic evaluation of leakage control as an alternative to investment in water supply projects.⁷⁰ However, benefit-cost methods were found to be systematically employed in allocating flood mitigation expenditures.⁷¹

66. J. Rees, *supra* note 14, at 295.

67. P. Herrington, *supra* note 15, at 7.

68. Department of the Environment, *supra* note 56, at § 6.

69. Monopolies and Mergers Commission, *Anglian Water Authority and North West Water Authority: A Report on the Sewage Function of the Two Authorities* (1982).

70. Monopolies and Mergers Commission, *Severn-Trent Water Authority, East Worcestershire Waterworks Company and South Staffordshire Waterworks Company: Report on Services Supplied by the Authority and Companies* (1981) (HC 339).

71. D. Parker, C. Green & P. Thompson, *Urban Flood Protection Benefits: A Project Appraisal Guide* (1987).

The adoption of the business approach to water management during the late 1970s and 1980s has introduced fundamental changes in customer-industry relations. The government's privatization plans⁷² are designed to extend the principles of the marketplace to the water industry in its entirety in order to improve efficiency. Economic efficiency requires that water services are allocated to those consumers who most value them, where values are expressed as prices consumers are willing to pay. The government's rationale is that private water companies will have greater incentives to ascertain the needs and preferences of customers and to tailor their services and charges accordingly. Access to private capital markets, it is reasoned, will make it easier for water companies to pursue effective investment strategies for cutting costs, and the financial markets will be able to compare the performance of individual water companies against each other and other sectors of the economy, thus providing further impetus for performance improvement.

Equity

Since 1974, and with the removal of subsidies from domestic water supply charges, the water industry has moved progressively away from the concept of "socially" priced water services. The fact that "luxury" uses of water now form a high proportion of total water consumption has encouraged the view that income redistribution is not a water industry responsibility—instead a "business" philosophy prevails. This is tempered by the 1973 Water Act which requires Water Authorities to ensure that their water charges do not discriminate against any group in society. Domestic water charges vary quite considerably between Water Authorities and Companies, reflecting differences in costs of supply. The Water Authorities perform a difficult balancing act between setting charges which go some way towards parity while also reflecting local differences in the costs of supply and reducing economic inefficiency. The 1977 Water Charges Equalization Act was a short-lived, and largely unsuccessful, attempt to reduce differences in water charges defined as inequitable by the then labor government.

Within water industry institutions in England, land drainage is anomalous. Subsidy, albeit reduced, remains available for urban flood mitigation projects and, currently lower priority, agricultural drainage projects. Since, often through little fault of their own, urban residents discover that they live in flood prone areas, there is arguably a case for subsidy. However, in reality the continuation of subsidy is probably more related to the power of the agricultural land drainage lobby. Urban flood miti-

72. Secretary of State for the Environment, *supra* note 56, at 1-3.

gation projects are partly financed from local funds raised from all local ratepayers. Since in England and Wales it is unusual for more than a small minority of ratepayers to be flood prone, the local financing of a flood mitigation project involves redistribution of income towards the flood prone. A conflict between equity and economic efficiency objectives is currently being faced in the allocation of grant aid for urban flood alleviation projects. Standard of living and property value differentials between the north and the south in England and Wales have grown in recent years. Thus, it is often economically efficient to spend more upon alleviating flooding in wealthier southern communities because flood damage potential is greater. However, this leads to differential alleviation standards and equity issues. So far Water Authorities have chosen not to pursue strict economic efficiency criteria but pressure is now growing for greater weight to be given to economic efficiency considerations.⁷³

Environmental Protection

The net impact of water policy on environmental protection over the past two decades is difficult to assess but there have been some disturbing trends since the late 1970s. Through the 1973 Water Act and the 1981 Wildlife and Countryside Act, the Water Authority's nature conservation and environmental protection responsibilities have been strengthened and expanded. Environmental protection powers have also been strengthened through COPA. Whereas the 1973 Act only required the Water Authorities to "have regard" for conservation, the 1981 Act made the duties of Water Authorities more specific and made consultation with conservation bodies a statutory requirement.

However, the policy of public expenditure restraint and the financial stringencies affecting the water industry produced delays in implementing environmental protection legislation, notably COPA and European Community laws such as the bathing water quality Directive. These delays also allowed some sewage treatment plant discharge consent conditions to be altered downwards with clearly negative environmental impacts. After a long period during the 1960s and 1970s when river water quality improved, the mid 1980s are witnessing a net decline in river water quality in some regions and a growing farm waste pollution problem.⁷⁴ Falling rates of investment may also be leading to declining public health standards. Between 1979 and 1983 the average weekly number of cases of

73. D. Parker, *Principles of Urban Flood Alleviation Benefit-Cost Analysis* (1986) (Paper presented at Seminar on Flood Protection and Land Drainage, Hydraulics Research Ltd., Wallingford, UK).

74. See Water Authorities Association, *supra* note 61; Department of the Environment and Welsh Office, *supra* note 56, at 19-27.

dysentery and diarrhea tripled and may be related to the decay of urban water supply and sewer systems.⁷⁵

On the other hand, through the establishment of conservation guidelines, Water Authority land drainage projects are now more environmentally sensitive than previously. Even so, Water Authorities often fail to recognize the nature conservation opportunities provided by their reservoir and other facilities. Non-marketable environmental services including water quality regulation, pollution alleviation, recreation and amenity, fisheries and navigation, have all been substantially subsidized by the "marketable" services of Water Authorities—a principle to which the government stated its continuing commitment in 1986.⁷⁶ Whether the size of this subsidy is large enough remains a matter of intense debate.

Public Accountability

During the past 15 years local accountability of the water industry has been progressively dismantled. Prior to the 1973 Water Act, local government councilors had this responsibility. The creation of the Water Authorities in 1974 and the "removal" of water management from local government was the first major step in reducing local accountability.⁷⁷ Even so, until the 1983 Water Act, a majority of Water Authority board members were appointed from local government (although because of the large number of local government units many were not directly represented on boards). The 1983 Water Act was the final "nail in the coffin" of local control, as the requirement for local government members to be appointed to boards was finally eliminated.

The water industry in England and Wales is now characterized by a system of central "ministerial" accountability—arguably a system inherently inferior to local accountability because of greater remoteness from "local" consumers (Table 2). This model has developed as part of the government's plans to control public expenditure and to lay the basis for water industry "privatization." All Water Authority board members are now appointed rather than elected to the new "streamlined" boards. The consumer consultative councils are advisory bodies and lack "teeth." However, during the 1980s government has chosen to make greater use of the Monopolies and Mergers Commission to investigate the efficiency of the water industry and to determine whether individual Authorities are operating in the public interest. As in many areas of public policy in Britain, there is now greater use of Parliamentary Select Committees to investigate water policy.

75. Johnson, *Old Drains and Diseases*, *New Statesman*, 9-10 (1985).

76. Department of the Environment and Welsh Office, *supra* note 56, at § 2.15.

77. D. Parker & E. Penning-Rowsell, *supra* note 5, at 247.

TABLE 2

**The Principal Public Accountability Mechanisms of the Water Industry in
England and Wales in 1987**

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1. Water Authorities are accountable to Parliament through the Secretary of State for the Environment and the Minister of Agriculture, Fisheries and Food.
 2. Ministers have power of direction.
 3. The government sets external financing limits, capital investment limits and performance aims.
 4. Water Authorities are subject to investigation by Parliamentary Select Committees and the Monopolies and Mergers Commission.
 5. Water Authority board members are appointed by Ministers.
 6. The form of borrowing is determined by government.
 7. The annual plans of Water Authorities are submitted for approval by Ministers and the annual report is laid before Parliament.
 8. The Water Authorities are subject to public audit.
 9. The discharge consent conditions of Water Authority sewage treatment works and results of monitoring of discharges are available for inspection in public registers.
 10. Water Authorities are advised by statutory consumer consultative councils.
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Integration with Other Areas of Government Policy

Recognition of the need to integrate water policy with other areas of government policy has grown.⁷⁸ Agriculture and water policy is proving a particularly problematic area where there is a major need for policy integration. For many years agricultural policy has been geared to increased farm output. Expansion has been encouraged and driven by a wide range of price supports, subsidies and government grants. Farmers have received incentives to drain wetlands and to "improve" farm land. The environmental effects of these policies in terms of wetland loss have been dramatic.⁷⁹ During 1984, under pressure from conservationists and the public unpopularity of European Community food surpluses, the Ministry of Agriculture, Fisheries and Food changed its policy towards grant-aiding wetland drainage. Agricultural drainage is now a low priority and farmers are being compensated to continue traditional farming practices rather than "improving" their land through drainage. Progress has therefore been made in creating wetland conservation and agricultural policies which are more mutually supportive rather than conflicting.

During the past two years strenuous efforts have been made by the Department of the Environment to halt the growth in river pollution from

78. Parker, *Integration of Water Policy with Other Government Policies: UK Country Overview*, Report for OECD Environment Committee (1987).

79. E. Penning-Rowsell, D. Parker & D. Harding, *supra* note 18, at 120.

farm wastes.⁸⁰ Even though the Minister of Agriculture, Fisheries and Food is jointly responsible for promoting national water policy, the agriculture ministry has been reluctant to agree to measures designed to reduce the pollution problem. Nitrate concentrations in water supplies have steadily increased posing threats to public health. An inter-departmental committee is about to report on remedial measures.

A liaison system exists between Water Authorities and local planning authorities over developments likely to increase surface water runoff and developments in flood risk areas. This liaison system appears to have avoided some of the more extensive flood plain developments which would have otherwise occurred, but there is growing evidence that incremental flood plain development continues causing flood loss potential to rise.⁸¹

NEW CHALLENGES: 1987 AND BEYOND

As of mid-1987 the water industry in England and Wales finds itself part way through a major institutional transformation which has its roots in the 1960s. This transformation has already witnessed the creation of river-basin based multi-functional agencies, the demise of the locally controlled public health service oriented water industry which was part of the post-war "welfare state," and its replacement by a regional-state controlled business management oriented industry bent on introducing economic and financial imperatives into water management. If the Thatcher government is elected to a third term, the next major step is likely to be "privatization" which will be the basis for the "completion" of the transformation. Whatever happens, the water industry now looks certain to continue to be well and truly at the center of the political arena.

Whether privatized or not, the water industry faces several major challenges. Much of the physical plant is run down—owing to inheritance and reduced spending—and the prospects of replacement are not bright in most regions. Water charges have risen consistently above the rate of inflation and there has been adverse public reaction. Environmental quality standards have come under great pressure and standards have fallen in some areas. Though much has been achieved in improving water quality in some regions, the record of the 1980s is much less impressive and discharge consent conditions for many sewage treatment works have been slackened. Also, to some extent river water quality improvement has been

80. Water Authorities Association, *supra* note 61.

81. Parker & Penning-Rowse, *Flood Hazard Research in Britain*, 7 *Progress in Human Geography*, 182 (1983).

achieved at the cost of moving the areal incidence of the problem—from the rivers to the estuaries and to the coasts.

Despite the growing acceptance of a business management philosophy, the introduction of economic principles into water management has been slow. It seems certain, however, to continue. The more rigorous pursuit of economic efficiency increasingly raises problematic equity implications and thus political choices. There is no universal agreement that the present emphasis on economic profitability should be the main consideration in decisionmaking. While privatization may solve some of the problems of the water industry, it clearly cannot be relied upon as a panacea for dealing with all of them. Whether consumers will receive a better service from a privatized water industry remains very much in the balance.

CONCLUSION

The Thatcher government called the awaited general election for June 1987, one year earlier than necessary, and succeeded in being returned for a third term with a large majority. Since then the government has confirmed its intention to "privatize" the water industry. However, the "privatization" proposals published in July 1987⁸² reflect a radical rethink following intense lobbying. The industrial lobby believes that one private company should not be allowed to regulate the polluting discharges of other private industrial companies, and the environmental lobby has raised serious questions about private water companies serving shareholder's interests also being responsible for water quality regulation.

The government's revised proposals envisage the creation of state-run National Rivers Authority which will take the responsibility for "regulatory" functions including those relating to water resource planning, pollution control, land drainage, fisheries and some recreation and conservation duties. The remainder of the water industry—the "utility" functions such as water supply and sewage disposal unencumbered by regulatory and environmental functions—will be "privatized." These latest proposals herald the reformation of integrated river basin management which the Thatcher government found so attractive eighteen months earlier.⁸³ Ironically, the chairman of Thames Water Authority—the leading proponent of "privatization" of the water industry and a strong supporter of integrated river basin management—now finds himself being the most outspoken critic of the government's new proposals.

82. Department of the Environment, *The National Rivers Authority—the Government's Proposals For a Public Regulatory Body in a Privatized Water Industry* (1987).

83. Secretary of State for the Environment, *supra* note 56.