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Changing Context of Water Resources Planning: The Next 25 Years

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THE CHANGING CONTEXT OF WATER RESOURCES PLANNING: THE NEXT 25 YEARS

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Contemplation of the nature of the world of tomorrow has seldom been a profound concern of water resources planners. On the whole, they have been content to assume that the future will be largely an extension of the present. In most water plans little change is anticipated in the nature of human needs, social values, policies, institutions, or technology. Such an assumption simplifies the planning task but it ignores reality. Experience in various parts of the world clearly shows that such changes do occur, and that when they are not anticipated, plans often fail to attain their objectives[1] or encounter substantial opposition. Recent events, such as the questioning of the growth ethic, the mounting opposition to developments that will result in major environmental disruption or adverse impacts on native populations, further emphasize the need to take account of the changing context in which water resources plans are formulated and then implemented.

This article attempts to shed light on the changing context in two ways. First, it describes a simple heuristic model of the social environment within which water resources planning takes place. Knowledge of such an environment is a prerequisite to understanding what the major problems are and how they might be solved. Second, it discusses a number of concepts that have emerged in water resources planning in the past half century, and then relates these to various social environments. The picture that emerges is one of gradual improvement in water management in those countries where planners have been able to successfully blend needs with technological innovation and the modification of institutions. In other countries, however, there have appeared growing discrepancies between needs and technology, or needs and institutional adjustment. As a consequence, problems in many parts of the world have become gradually worse, and in some they have reached crisis proportions.

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1. E. Vlachos, Transfer of Water Resources Knowledge (1973); D. Hendricks, Environmental Design for Public Projects (1975).

Planning has either failed or has been unable to perform the role expected of it. The article concludes with some suggestions as to how this deficiency might be overcome.

A STATE OF SOCIETY MODEL

Effective water resources planning in the future will rest increasingly on an understanding of the factors that shape societies and their institutions. This is a complex subject and far beyond the scope of the present paper. It is possible to discern, however, three types of factors that appear to play an especially important role in this connection, namely (a) needs, (b) technological innovation, and (c) institutions. They may be represented as three interrelated spectra or scales, as indicated in Figure 1.

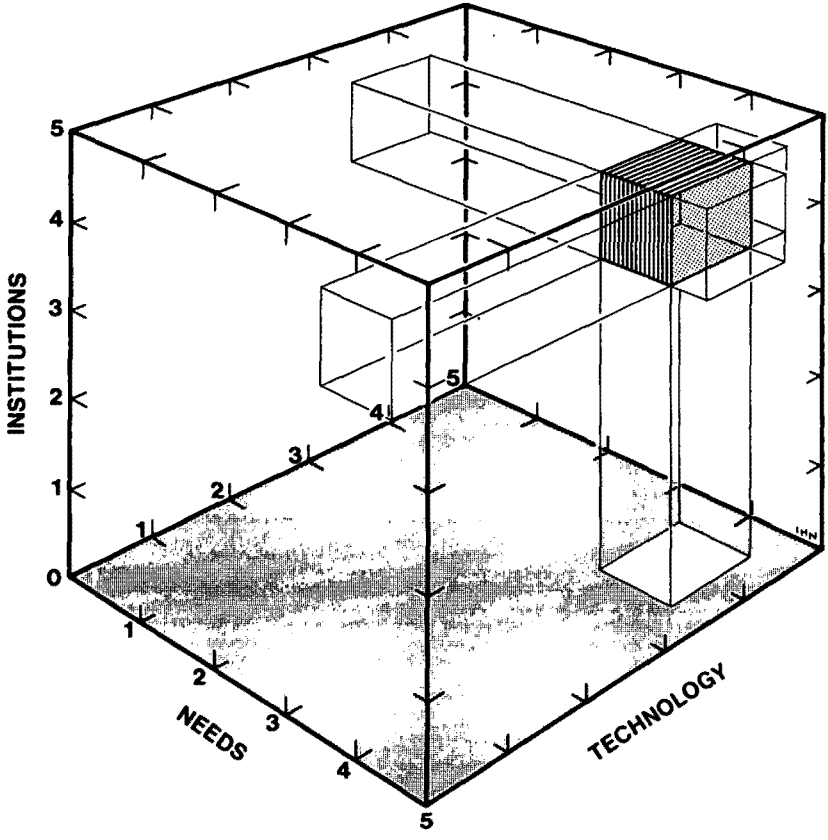


FIGURE 1

Needs

A distinguishing characteristic of societies is what they perceive as needs.[2] In very primitive societies these are defined largely in terms of requirements for biological survival. Depending on climate and activities, these might be a few pints of water a day, a thousand or so Kcal of food, clothing and shelter, and means of defense against wild animals and other marauders. This level of requirements is represented at the lower end of the needs spectrum. Here, aspirations are based mainly on the wisdom of the past and on the limits imposed by the environment. Aspirations tend to rise, however, as contact is made with the outside world and knowledge of attainments elsewhere is spread. Progressively, wants and luxuries are added to the list of satisfactions desired by the society, and gradually as these are attained they come to be regarded as needs. Thus the automobile was once a luxury in western society. Development of the means to make it broadly available allowed the automobile to be transformed into a want. Economic and social organization have since made it a necessity in some parts of the world.

The nature of needs tends to change over time. Initially biological needs are the most critical and most of the society's time and effort is devoted towards their satisfaction. Progressively, however, material wants become more and more important. At the far end of the scale, psychological needs assume an increasingly critical role. This presents modern society with an important challenge. As Rosak, Garcia and others have suggested, the burning desire for societies at this end of the scale is not for an extra car, a larger house, or labor saving devices but for the opportunity for creativity or self-realization.[3]

Technologies and Innovations

Societies can also be classified according to the nature of the technologies they employ, and their propensity to innovate.[4] At one end of the scale are societies which use very simple tools and methods, such as digging sticks, stone axes, boomerangs, or shadoofs. Such technologies are usually well suited to the tasks to be performed and the environment in which they are used. Higher levels of technological sophistication may be introduced, either through local discovery or from ideas brought in from elsewhere. Gradually, technological innovation becomes recognized as a basic ingredient in

2. A. Maslow, Motivation and Personality (1954).

3. T. Roszak, Where the Wasteland Ends (1973); J. Garcia, The Moral Society (1931); Etzioni, *Basic Human Needs, Alienation and Inauthenticity*, 33 Am. Sociological Rev. 870 (1968).

4. L. White, The Concept of Culture (1972); A. McAlester, The History of Life (1968).

economic growth, and it becomes institutionalized. More and more effort is devoted towards the search for new ways of doing things.

At the far end of the scale are sophisticated technologies like satellites, computers, nuclear weapons, artificial chemical compounds, genetic engineering, and so on. Basic biological needs can be easily satisfied, and a considerable proportion of the society enjoys a high level of material well-being. The institutionalization of science and technology, however, tends to bring a continuing commitment to particular kinds of wants, and new kinds of needs may not be readily recognized or provided for. A consequence may be that technological innovations will become increasingly out of phase with needs and may even create more problems than they solve.[5]

Institutions

A third dimension of societal evolution relates to the kinds of institutions that are established for social and economic organizations. Here again one can visualize a scale. At one end there is the primitive tribe with its simple rules governing the relationship of the individual to the group. One's role in such a society is usually determined by birth, tradition, or the needs of the group: there is little freedom of choice. The essential feature is that there is a unity of purpose, that of biological survival.

In contrast, at the other end of the scale is "modern" society, typified by North America and western Europe. Such a society pursues several purposes rather than a single one. Its institutions are highly complex, reflecting the development of an increasing degree of specialization of functions and the tendency to shift the basis of organization from the local area to the national or international level. Progressively, the government becomes more and more involved in economic and social affairs. Modern society is also characterized by a high degree of freedom for the individual in choosing an occupation or a role in that society. There is also considerable tolerance of points of view which may differ from that of the mainstream. In some instances it may even be possible to opt out from the society while still continuing to enjoy some of its benefits.

Modern society, however, is faced with several dilemmas. The pursuit of progressively higher levels of material well-being, for example, may be purchased at the price of declining economic and political independence, and perhaps severe environmental disruption as well.

5. N. Cross, Man-Made Futures: Readings in Society, Technology and Design (1974); H. Brooks, Science, Growth and Society: A New Perspective (1971); F. Harris, Social Science and National Policy (1970); D. Greenberg, The Politics of Pure Science (1969); D. Price, The Scientific Estate (1965).

The attempt to remove social inequalities and economic uncertainty may result in increasingly higher degrees of government intervention. There is also a tendency for institutions to focus attention almost entirely on problems already encountered rather than to prepare for new ones. Inevitably there is inertia and inflexibility. Often it may require a major crisis to stimulate a change in laws, policies, or administrative structures.

The perceived water crisis in North America has demonstrated each of these dilemmas. It seems that water demands in the United States are growing much faster than the long run capacity to satisfy them by the existing extensive approach to water management, in which cities or regions move increasingly further afield to obtain supplies. For its part, technology has been slow in shifting from this approach to an intensive one in which the objective is to make the best possible use of existing supplies. Meanwhile, the institutional framework of laws, policies, and administrative structures has seemed relatively unresponsive to the changing situation. A really intense water shortage, devastating flood, or severe deterioration in water quality appears to be the prerequisite for concerted action.

Implications for Water Resources Management

There are several implications of the model for water resources management. It indicates, for example, that as one moves along the scales of needs and technology, the pressures on the resource base will increase, and that this will be accompanied by growing conflicts in resource use and environmental disruption. It also shows that the nature of the demand for resources may change, reflecting shifts in the type of needs. Thus at one stage the major demand for water will be to satisfy biological requirements, at another it may be to provide for material wants, and at a third to assuage psychological needs.

Locating Various Counties in the Model

Theoretically it is possible to locate any society or country with respect to each of the three dimensions. Canada, for example, ranks fairly high on each of them, at level 4. In terms of needs, the main emphasis is on the satisfaction of material wants, although the importance of psychological needs is beginning to be felt. In terms of water management, the situation is one of continuing high demands for water for homes, factories, and energy and food production. At the same time, however, a rapidly growing demand for water based recreation and the preservation of natural landscapes is emerging.

Canada is technologically sophisticated, although it imports tech-

niques, methods, and ideas from elsewhere, particularly the United States. In addition, economic, social, and political institutions are well developed.

The stage of societal evolution of any country can be located in the diagram at the intersection of its position on the three planes: needs-technology; needs-institutions; and institutions-technology. Canada's position is high and to the right. The United States, the United Kingdom, West Germany, or France would be in a similar location in the diagram. Countries in the Third World tend to occupy lower positions on the various scales. In some instances such countries have attained a successful equilibrium between needs, technology and institutions, and have moved to progressively higher levels on each scale. In other cases, however, disequilibria have appeared, or are beginning to appear. Occasionally, inappropriate technologies have been introduced, with the result that the problem has remained unsolved, or perhaps even worsened. Studies undertaken by Wiener, for example, have shown that irrigation projects have often failed because they were inappropriate to the local culture, or they were unsuitable to the local physical environment.[6] Hewapithirane and White have shown that the introduction of flood control structures has sometimes not only failed to reduce flood losses but, by creating a feeling of maximum protection, has actually induced an increase in such losses.[7] Other researchers have reached similar conclusions about water development schemes in certain parts of the world.[8] In addition, institutional adjustment has sometimes lagged far behind the appearance of new problems, or the need to introduce new concepts or technologies.[9]

CHANGING CONCEPTS AND TECHNIQUES IN WATER RESOURCES PLANNING

Parallel with the changing context of water resources planning, there have been some important modifications in approach and technique. To an important extent these modifications have been a response to the emergence of new concepts in water management,

6. Wiener, *Water Resources Development Policies and Transfer of Knowledge from Developed to Developing Countries* in Transfer of Water Resources Knowledge (E. Vlachos ed.) *supra* note 1, at 237.

7. Hewapathirane & White, *Obstacles to Consideration of Resources Management Alternatives: South Asia Experience* in Transfer of Water Resources Knowledge (E. Vlachos ed.) *supra* note 1, at 252.

8. M. Taghi Farvar & J. Milton, The Careless Technology: Ecology and International Development (1972); C. Goldman, Environmental Quality and Water Development 192-215 (1973).

9. Hendricks *supra* note 1.

generally leading to the adoption of a broader and more comprehensive viewpoint. Gradually there has been a shift from single purpose to multiple purpose projects and from single projects to systems of projects. Increasingly there is an attempt to consider a broad range of alternatives in the search for solutions to water problems. Multiple means programs are replacing the single means approach of the past. At the same time there has been a gradual expansion in the geographical horizon of water resources planning, from the local area to the region, and, more recently, the nation. There are also an increasing number of international ventures in water resources planning. In addition, there has been a shift in the objectives of water planning itself. Formerly the intent was to solve a given water problem, such as water scarcity, drainage, or floods. Today, however, water development is being regarded as an instrument of economic and social change. Programs undertaken under the auspices of the World Bank are illustrative.

White[10] has described the various strategies that have evolved from these concepts, and the ways in which they have been applied in the United States. These are illustrated in Figure 2. The various concepts have been adopted to varying degrees in other countries including many in the Third World. Generally they have stimulated an increase in the sophistication of planning, and in water management institutions.

Despite such improvements, water resources planning in many parts of the world has important deficiencies. One of the most critical weaknesses is the concentration on a narrow range of alternatives. As noted earlier, an extensive rather than an intensive approach is typically used in dealing with water supply problems.[11] In the case of water pollution the emphasis tends to be on punitive legislation and construction of treatment plants with relatively little attention to such alternatives as economic incentives; in the case of floods the emphasis tends to be in keeping the water off the flood plain by constructing dams or dikes rather than minimizing flood losses by selective land use zoning ordinances.[12]

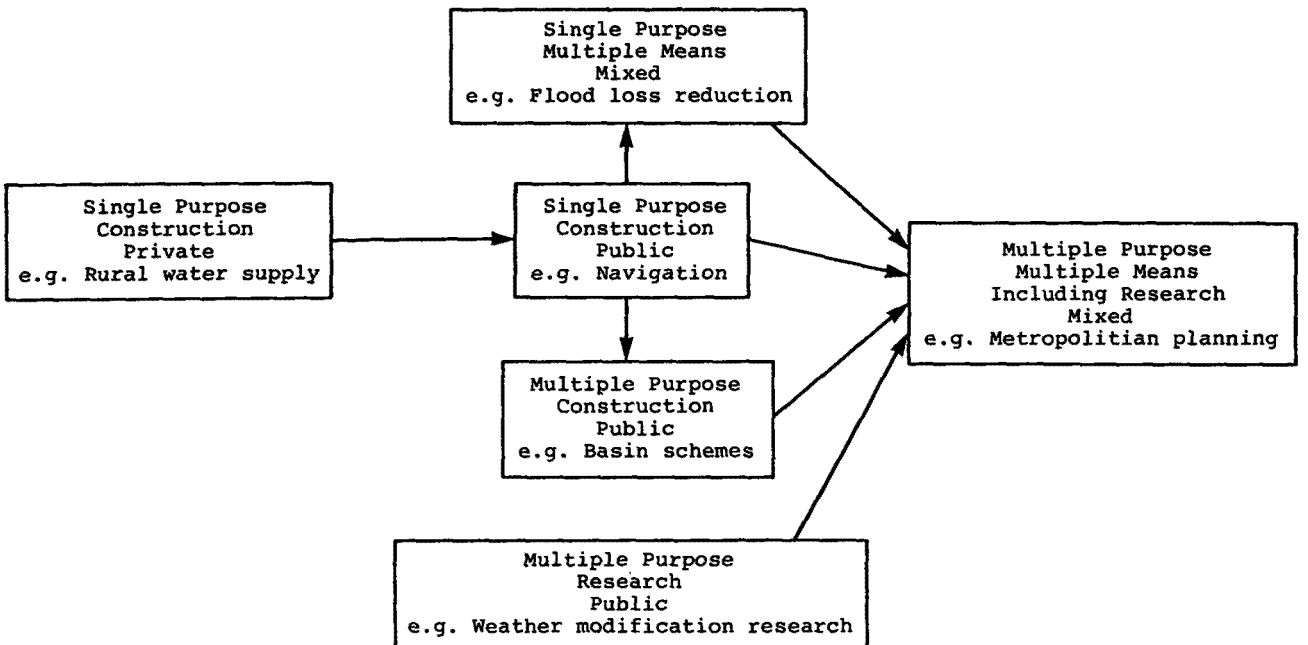
Another deficiency has been the tendency of planners to rely on technical and economic considerations in evaluating proposals for water resource development. The result has been to underplay or even ignore the importance of other factors, which may be even

10. G. White, Strategies of American Water Development (1969).

11. Sewell & Rouesche, *Peak Load Pricing and Urban Water Management: Victoria, B.C., A Case Study*, 14 Nat. Res. J. 383 (1974).

12. G. White, Choice of Adjustment to Floods, Univ. of Chi. Dep't of Geog. Research Ser. No. 93 (1964).

FIGURE 2. SCHEMATIC DIAGRAM OF CHANGES IN WATER MANAGEMENT STRATEGIES



SOURCE: G. F. White, *Strategies of American Water Management* (Ann Arbor: The University of Michigan Press, 1969), p. 102.

more critical in assessing feasibility or desirability. Experience in Africa,[13] India,[14] and North America[15] in the construction of major dams and reservoirs, however, underlines the importance of taking environmental and social impacts into account. The development of the Kariba Dam on the Zambezi River provides a dramatic illustration. Construction of this project resulted in such massive growth of water weeds that local fisheries on the river were severely damaged; the Tsetse fly spread to areas where it had formerly been absent, with devastating effects on cattle populations; reduction in flows below the dam severely limited agricultural production in the area immediately downstream; and native populations from the reservoir area found it impossible to continue their traditional farming practices in the areas to which they were relocated.[16] Unfortunately, such matters were given only limited consideration in the planning of the project. Similar weaknesses occurred in the planning of the Aswan Dam on the Nile,[17] the Indus Diversion Scheme,[18] and the Peace River project in British Columbia, the Churchill-Nelson Diversion in Manitoba,[19] and the James Bay project in Northern Quebec.[20] With the mounting concern about the environment and about the rights of native peoples, it is clear that such matters will need to be given much more attention in the future.

THE NEXT 25 YEARS

The next 25 years will witness a massive increase in the world's population, estimated to reach some 7 billion by the end of this century. Accompanying that expansion will be enormous increases in the demands for water and water-related goods and services, and bitter conflicts among those competing for the use of particular water bodies. The planning task will inevitably become more complex.

What are the ways in which planners can meet this challenge?

13. W. Warren & N. Rubin, Dams in Africa: An Inter Disciplinary Study of Man Made Lakes in Africa (1968).

14. K. Rao, India's Water Wealth: Its Assessment, Use and Projections (1975).

15. C. Goldman, Environmental Quality and Water Development, *supra* note 8.

16. Scudder & Colson, *The Kariba Dam Project: Re-settlement and Local Initiative*, in Technology and Social Change 40 (H. Bernard & P. Pelto eds. 1972).

17. George, *The Role of the Aswan High Dam in Changing the Fisheries of the Southeastern Mediterranean* in The Careless Technology: Ecology and International Development (M. Taghi Farvar & J. Milton eds.), *supra* note 8, at 159.

18. A. Michel, *The Indus Rivers* (1967).

19. Peace-Athabaska Delta Project Group, The Peace Athabaska Delta: A Canadian Resource (1972); Morley, *It's Not Too Late: Yet*, 2 Alternatives 4 (1973).

20. Environment Canada, James Bay Hydro-electric Project: Environmental Concerns (1975); D. Rosenberg, *James Bay Update*, 4 Alternatives 4 (1974).

More specifically, what can they do to accommodate the constantly changing relationships between needs, technology, and institutions on the one hand, and the emergence of new ideas and concepts in water management on the other? Four directions for future attention present themselves.

Improvement of Assessment of Demands

One of the most critical elements in water resources planning is the estimation of present and future demands for water and water related goods and services. At present the data collection programs and methodologies used for such estimation in most parts of the world are relatively crude. As a consequence, even in some of the more industrialized countries, there is only a vague picture of how much water is used for various purposes, and the level of demand for certain goods and services. Forecasting methodologies are weak, and often consist of little more than straight line projections of existing trends.

Inaccurate estimates can lead to important economic and social losses, either because too much capacity is provided or because it is insufficient. In some parts of the world huge reservoirs have been constructed to provide irrigation water which the planners believed farmers would be eager to use. Unfortunately, in certain instances the planners were overly optimistic. The Columbia Basin project, begun in the Pacific Northwest of the United States in 1936, was intended to irrigate over a million acres. So far only one half of that total has been irrigated. The South Saskatchewan project in Canada was hailed on its completion in 1958 as a major means of overcoming the problems of monoculture in the Prairie provinces. It was to irrigate some 500,000 acres of land. So far, less than 10,000 acres have been irrigated. In both instances there have been significant economic losses. The capital could have been put to more productive uses elsewhere.

It is clear that as capital for water resource development becomes increasingly scarce, and as the competition for particular water resources becomes more and more intense, the need for better estimates of future demands will grow. A number of attempts have been made in several countries[21] to develop improved methodologies for forecasting, and the United Nations has undertaken or sponsored

21. W. Sewell & B. Bower, Forecasting the Demands for Water (1969); T. Lee, Approaches to Water Requirements Forecasting: A Canadian Perspective, Environment Canada, Social Sci. Ser. No. 9 (1972); D. Tate & R. Robichard, Industrial Water Demand Forecasting, Environment Canada, Social Sci. Ser. No. 10 (1973); N. Wollman & G. Bonem, The Outlook for Water (1971).

work in this field as well.[22] These attempts have already begun to filter into water resources planning. But several problems remain. One is to develop methodologies that are simple enough to be applied in those countries that do not have large resources of skilled personnel or computers. Another is to devise techniques of estimating demands for non-priced goods and services. Proxies have been worked out for some of the latter, as in the case of certain forms of outdoor recreation. But the area of the satisfaction of psychological needs remains largely uncharted. It is there that some of the major demands are likely to come in the future, particularly in countries that have passed beyond the satisfaction of material wants alone and must deal with the problems of psychological stress and the search for alternative lifestyles, as suggested in Figure 1.

Improved Assessments of Alternatives

A second critical challenge for planners is the improvement of the evaluation of alternatives. In part this will require the examination of a wide range of criteria commonly in use. In part it will entail the development of better techniques for identifying and measuring impacts. Though a great deal of progress has been made with respect to techniques for assessing technical and economic dimensions, there remain substantial weaknesses in methodologies used for evaluating environmental and social effects.[23] To an extent such deficiencies stem from a lack of understanding of the phenomena involved. In some instances, in Africa for example, relationships between water development and the growth of certain weeds or insect species had not been studied before. In others, there had been no opportunity to investigate the effects of scale on the relationships. The Kariba and Aswan projects were several times larger than other projects built previously in that part of the world.

Improvements in evaluation methodology depend partly on an expanded research effort. Equally important, however, is the modification of procedures, administrative structures, and policies to ensure that the advances in knowledge and understanding resulting from research can be incorporated into decision making. Research with respect to environmental impact assessment provides an illustration. A considerable amount of work has been done in the past two or three years to find better ways of identifying and measuring environ-

22. U.N. Dep't of Econ. and Soc. Aff., The Demand for Water: Procedures and Methodologies for Projecting Water Demands in the Context of Regional and National Planning, Nat. Res./Water Series No. 3 (1976).

23. Friesma & Culhane *Social Impacts, Politics, and the Environmental Impact Statement Process*, 16 Nat. Res. J. 339 (1976).

mental effects of resource development projects. As yet, however, no completely successful administrative structure has been devised to insure that relevant information is gathered and objectively evaluated, or that the views of those who would be affected are consulted and these views are visibly taken into account.[24]

The need for improved methodologies of evaluation is equally great in lesser developed countries. Some of the changes that will follow the development of water projects in these countries will be far more dramatic than they would be, say, in North America or Europe. Technical expertise is scarce, however, and resources for data collection are limited. The challenge here is to devise simple methodologies which can be easily applied, and which will give broad indications of effects. Various international bodies have made useful contributions in this connection. The SCOPE Working Group on Man-Made Lakes, for example, has identified a number of parameters that need to be measured, and has offered advice as to ways in which that task can be accomplished.[25] These efforts need to be encouraged and expanded.

Institutional Innovation

A third area for urgent attention is the acceleration of the process of institutional innovation. While there have been important advances in the technology for harnessing and utilizing water resources, and in techniques of analysis, institutional innovation has tended to lag behind. The inertia undoubtedly stems in large part from the weight of tradition in water management and uncertainties of water managers as to how they might relate personally to new agency structures, legal arrangements, or policies. It results also, however, from uncertainties as to whether new structures or institutions that have been tried elsewhere will solve the local problem.

The matter of institutional innovation poses several questions; among them the following seem especially pertinent.

(1) Is the river basin the most appropriate areal unit for water management?
(2) Are problems of co-ordination among resource agencies best overcome by the establishment of an omnibus agency (such as a Department of Environment) or by the creation of inter-departmental committees?
(3) Should water problems be dealt with separately at the local level

24. Dreyfus & Ingram, *The National Environmental Policy Act: A View of Intent and Practice*, 16 Nat. Res. J. 243 (1972).

25. SCOPE Working Group on Man-made Lakes, Man-made Lakes as Modified Eco Systems, SCOPE Report No. 2 (1972).

or should they be treated as but one of the matters with which general purpose local governments must deal?

(4) Are effluent discharge fees a more effective and equitable means of dealing with water quality problems than the imposition of regulations?

(5) Can pricing be used effectively as a means of managing water demand?

(6) Would the establishment of a market for water rights lead to improvements in efficiency, and would the social benefits outweigh the social costs?

There are no simple or universally applicable answers to such questions. It seems, however, that there has been sufficient experience in a variety of hydrologic, economic, and cultural circumstances to permit some generalizations to be made and guidelines to be developed. Thus far, however, there have been few in-depth studies of any of these matters, particularly in the Third World where the problems of institutional adjustment are especially urgent.

International Co-Operation

Another important challenge for water resources planners is to find ways for increasing international co-operation in water management. The need is emphasized by the fact that the number of international water bodies has grown dramatically in the past thirty years as the number of nations has increased, and the fact that the development of such bodies may hold the key to economic and social progress in many parts of the world. In some cases there are considerable incentives for nations to co-operate in developing international rivers or lakes. This is particularly true where such development is highly important to the co-riparians and where the resource involved has either common property or public goods characteristics. The Great Lakes, shared by Canada and the United States, have these characteristics. There are other instances, however, where one or more of the riparians has little incentive to participate in co-operative international action. Switzerland, France and Germany, for example, as upstream riparians have little incentive to share the cost of cleaning up the Rhine with the Netherlands which receives the effluent loads from all of the others. Similarly, India is reticent about mounting major efforts to control floods in the mouth of the Ganges-Brahmaputra system, whilst Bangladesh desperately needs such control. There are other prisoner situations, such as a co-riparian which is situated between two others on a navigable stream.

The search for means of stimulating increased co-operation requires first an understanding of the factors which tend to act as

barriers. It also needs an understanding of the different levels of co-operation. Le Marquand[26] and others[27] have begun to develop models of situations which encourage joint development and others which seem to discourage it. The results of this work seems to suggest that there are certain internal factors (such as the physical characteristics of the water body and the economic features of the region in which it is located) which play an initial role, and other external forces (such as the general state of international relations between the co-riparians, alternative opportunities, defense considerations, etc.) which may be the ultimate determining factor.

There are several possible levels of co-operation. The minimum level of commitment would be in a data collection program where there was a free interchange of information among all parties. There are many bilateral, multilateral, and international agreements for this purpose. The agreement between the countries sharing the Nile River, for the collection of data on stream flows is one example. The programs undertaken under the auspices of WMO, and WHO are others. At a somewhat higher level is joint planning, in which the co-riparians agree to co-operate in investigations of needs and potentialities in the river basin. In some cases the studies are undertaken by the co-riparians without outside aid. In many instances, particularly in the Third World, such studies are generally supported by technical and/or financial assistance from more advanced countries or through international organizations. The highest level is actual development, for this involves continuous commitment of all parties. Several joint ventures of this kind have evolved in various parts of the world. The co-operation between Canada and the United States in the development of the Columbia and St. Lawrence Rivers is one illustration. The planning of the Danube-Rhine-Main Canal by the various countries sharing those rivers is another.

Experience suggests that it is not especially difficult to foster co-operation at the data collection stage. It is somewhat more challenging to do so at the planning stage, but there are a considerable number of illustrations of joint ventures. The most difficult of all is joint development, and especially where the facilities would have to be jointly owned or operated, as in the case of a dam which

26. D. LeMarquand, International River Basin Co-operation: Some Factors Influencing Agreement, UNDP/UN Interregional Seminar on River Basin and Inter Basin Development, Background Paper, Budapest, Hungary (September 1976).

27. U.N., Dep't of Econ. and Soc. Aff., Management of International Water Resources: Institutional and Legal Aspects (1975); Canada-United States, University Seminar, A Proposal for Improving the Management of the Great Lakes of the United States and Canada, University of Waterloo, Dep't of Man-Environment Studies, Waterloo, Ontario (January 1973).

would be astride a river which constitutes the boundary between two countries.

In brief, there are three basic challenges for planners concerned with the development of the world's international rivers. One is the search for incentives to encourage upstream riparians to manage rivers in the interest of downstream riparians. The second is to devise guidelines for co-owners of a common property resource (such as a lake) to manage the water body in such a way as to maximize the returns from its use. The third concerns the problem of raising the level of commitment from data collection to planning, and then development itself.

AN OVERVIEW

Water resources planning has made some major advances in many parts of the world in the past half century. The challenges of the next 25 years, however, will be even more demanding, and a shift in perspective and improvements in techniques of analysis will be required if these challenges are to be met. The basic requirement will be to insure that planning responds to the changing societal context of needs, technology and institutions. Planners, therefore, will have to acquire a much better understanding of social and political processes, and they will have to become visionaries as much as technicians and philosophers.