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Annotated literature

To aid those in their research on the topics found in this document, we have included some abstracts and annotations for materials found in the reference list. There was no systematic judgement made as to what would be included or excluded; it was based on availability at time of completion of this document.

af Ornas, A.H. and S. Lodgaard. 1992. *The Environment and International Security*. Oslo, Norway: Uppsala University, Department of Human Geography/International Peace Research Institute. The book consists of proceedings of a workshop held in Uppsala in 1991. It aimed to explore the many links between environment and security, looking at two types of environmental conflict: conflicts between man and nature, centring on sustainability, and conflicts between man and man, centring on development. Nine short papers examine environmental destruction as a method of warfare, cases of social conflict arising from ecological destruction, the internationalization of the Finnish forest conflict, and water resource conflicts. (M. Amos)

Alemu, Senai. 1995. The Nile Basin: Data Review and Riparian Issues. Final Draft Report. Washington, DC: AGRPW, The World Bank. This report highlights the background information essential to evaluate the prevailing characteristics of the Nile basin as a unified system. Population trends, flow regimes of the Nile and its main tributaries, water use patterns, future and potential water requirements and water availability in the 10 riparian countries are discussed. The report makes a review and assessment of Nile water treaties and agreements entered between different parties in the last 100 years, including the recent endeavours for regional cooperation. Efforts were made to make an overview of the dynamics of riparian positions on certain key issues of the Nile. The report also narrates previous suggestions forwarded with respect to Nile water allocation criteria and specific proposals. Special emphasis is made of the key riparians of the Nile basin – Egypt, Ethiopia, Sudan, and Uganda. It is believed that the report may be useful to Nile basin policy-

makers, the donor agencies, professionals engaged in water projects in the basin, and above all to those initiators of change who are committed to resolve conflicts and bring about change – change for a better quality of life for the present, and a better world for tomorrow's generations of the Nile basin countries.

Alheritiere, Dominique. 1985. Settlement of Public International Disputes on Shared Resources. *Natural Resources Journal* 25(3): 701–11. A literary and ideological overview of the negotiation of existing resource conflicts. The author begins with a discussion of some treaties and history of UN-era resource conflicts. The author continues with a catalogue of the various means of peaceful dispute resolution as encouraged by the United Nations texts.

Ali, Mohammed. 1965. *The River Jordan and the Zionist Conspiracy*. Cairo: Information Department. Short history of the Middle East and water politics since 1916, legal aspects, and some technical data.

Allan, J.A. 1992. Substitutes for Water Are Being Found in the Middle East and North Africa. *GeoJournal* 28(3): 375–85. Evident mismatches exist between the demand and supply of water in many countries particularly in the semi-arid and arid worlds. The resulting food gaps which concern both the national governments of these countries as well as the international agencies which extend assistance to them, appear at first sight to pose challenges beyond the economic and political capacity of peoples and institutions to make the necessary adjustments. It will be argued that everywhere there are examples of conflict over water being avoided, and while the avoidance of conflict can in many cases be calculated to have been at a cost to the environment, nevertheless, to date serious conflict has been avoided. Case studies from a region seen to have the worst water resource future outside the industrialized world, the Middle East and North Africa, will be discussed, which exemplify the numerous strategies adopted by countries in their various ecological, economic, and political circumstances. A fortunate few governments have substituted oil capital for water while others have filled the food gap, which is generally an expression of the water gap, by ceding economic and political autonomy. (abstract)

Allee, D.J. 1993. Subnational Governance and the International Joint Commission: Local Management of United States and Canadian Boundary Waters. *Natural Resources Journal* 33 (Winter): 133–51. This article explores the subnational governance and the International Joint Commission on the local management of the shared waters of the Great Lakes. The focus, by both United States and Canada, for water management issues is on the states and the provinces involved, not just country to country. Allee suggests generalizations about some roles subnational governments have played, how they have been involved in Commission decisions, blocked or facilitated them, enjoyed access, been frustrated in meeting local objectives, and were able to use the process to complement other relations with their federal governments.

Amy, Douglas J. 1987. *The Politics of Environmental Mediation*. New York: Columbia University Press. An in-depth view of alternate dispute resolution, environmental conflicts, and mediation in the United States. Includes a grid of conflict types and the best situations in which to seek an ADR.

Andah, K. and F. Siccardi. 1991. Prediction of Hydrometeorlogical Extremes in the Sudanese Nile Region: A Need for International Co-operation. In *Hydrology for the Water Management of Large River Basins*, ed. F.H.M. Van de Ven et al., 3–12. International Association of Hydrological Sciences. Analysis of the 1988 floods in Sudan have shown that a lead time of at least one month is required for mitigation interventions. The present five days' lead time for prediction of Nile floods in Khartoum are not adequate for an efficient advance warning. The rainfall over Sudan exhibits frequent positive and negative anomalies. Two approaches are suggested in the present work. The first involves further analysis on the possible spatial coherence and teleconnections of rainfall anomalies over

Africa to enhance the lead time based on prediction of extreme events in other regions. The second requires an integrated real time flood forecasting and an effective weather monitoring system covering the countries sharing the Nile basin. These demand technical cooperation between the countries within the basin. (abstract)

Anderson, E.W. 1991. Hydropolitics. *Geographical Magazine* (February): 10–14. Discusses the likelihood of conflict as it governs some riparian politics. He examines all aspects of a water conflict: geographical location, national interest, military and/or political power to bear on the issue, and money.

—— 1991. Making Waves on the Nile. *Geographical Magazine* (April): 31–4. The Nile's course and geography creates heavy difficulties when anyone tries to divide it fairly. Sudan and Egypt use most of the water but contribute almost none in rainfall, whereas Ethiopia contributes a great deal of water but cannot use much at all due to technical considerations and war.

—— 1991. The Source of Power. *Geographical Magazine* (March): 12–15. Discusses Turkey and her relations with Iraq and Syria. Turkey controls both oil and water conduits to several nations, causing concerns on all sides. However, "friction is not the same thing as war."

Anderson, Kirsten Ewers. 1995. Institutional Flaws of Collective Forest Management. *Ambio* 24 (6, September): 349–53. This article examines the institutional development within the afforestation of village revenue lands in India as well as institutions set up for management of already existing forests. These institutions are "collective or joint forest-management committees" indicating a joint government-village arrangement for forest protection. However, it is often unclear or skewed who has which rights and to what. The present article argues for a careful analysis of the kinds of rights, of the categories of rightholders as well as the biophysical character of the resource itself. The degree of sociopolitical overlap between new induced institutions and the existing ones of local government such as the village panchayat is counterproductive. Another critical issue is the match between the institutional set-up and the biophysical characteristics of the resource itself. Both issues are examined in the article. (abstract)

Anon. 1994. Protection and Use of Transboundary Watercourses and International Lakes in Europe. *Natural Resources Forum* 18(3): 171–80. This paper analyses recent developments in national strategies and policies in Europe for the protection and use of transboundary waters, and describes progress made by European states in cooperating on these issues, in particular under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) pending its entry into force. (abstract)

Anonymous. 1987. Where Dams Can Cause Wars. *The Economist* 18 (July): 37–38. Discusses Turkey's place in the Middle East water issue. Turkey's dams will increase salt content of the Euphrates waters and reduce hydroelectric output of Syrian and Iraqi dams. Quotes Turgut Ozal (Prime Minister of Turkey), who says that competition over water will help foster peace.

Ashworth, John and Ivy Papps. 1991. Equity in European Community Pollution Control. *Journal of Environmental Economics and Management* 20 (1, January): 46–54. This paper examines the impact of an EEC pollution control directive on the profits of the firms in the chlor-alkali industry. Various definitions of equal treatment are developed and it is argued that knowledge of the relationship between discharges and various methods of abatement (the discharge function) is crucial to an investigation of the extent to which the directive meets the equity criteria. Estimation of total, average, and marginal costs implies that these criteria are not met by this directive. (abstract)

Associated Press. 1995. Water Crisis Looms, World Bank Says. *The Washington Post*, Monday, August 7. This newspaper article is a warning by Ismail Serageldin, a World

Bank vice president, on the water crisis that is looming. Serageldin discusses in general the areas that the Bank will be looking to fund in the future, indicating that the Bank will not fund projects that look only at irrigation or only at municipal use, but the plans impacting on the resource.

Azar, Christian and John Holmberg. 1995. Defining the Generational Environmental Debt. *Ecological Economics* 14 (1, July): 7–20. Assume that we have borrowed the earth from our children, and that we one day shall give it back to them and account for what we have done to it. Then we would have to try to restore the damage we have caused. Further, we would have to offer compensation for the damage we have done that we cannot repair at a lower cost. The generational environmental debt (GED) is a measure of these costs. In this paper we define and discuss the concept of GED and calculate GED for emissions of the greenhouse gas CO2. The global GED for CO2 emissions is estimated at 10,000 billion US dollars and the Swedish GED for CO2 emissions is estimated at 60 billion US dollars. (abstract)

Azar, Edward E. 1990. *The Management of Protracted Social Conflicts*. London: Aldershot. Discusses framework and backgrounds on the social implications of protracted conflicts, as well as Track Two diplomacy. Also extensive discussion of global problem solving: Lebanon, Sri Lanka, and the Falklands/Malvinas issues.

Bakour, Y. 1991. *Planning and Management of Water Resources in Syria*. Damascus, Syria: Arab Organization for Agricultural Development. A detailed account of Syrian water resources and policy bodies.

Barnard, William S. 1994. From Obscurity to Resurrection: The Lower Oranger River as International Boundary. In *Political Boundaries and Coexistence: Proceedings of the IGU-Symposium, Basle/Switzerland, 24–27 May*, ed. Werner A. Galluser, 125–34. New York, NY: Peter Lang. Situated in a remote part of Southern Africa, the lower course of the Orange river forms the international boundary between South Africa and Namibia for some 670 km. Boundary evolution commenced in 1847 when the river was proclaimed the northern limit of the Cape Colony; in 1890 the lower course became an international boundary between the British and German Empires, to be inherited and resurrected by their respective successor states in 1990. The spatial differentiation of the boundary area is controlled by the incised character of the river valley rather than its human occupancy; a border region never developed. For the 75 years when Namibia was a South African dependency, the separating functions of the boundary were suppressed although not entirely obliterated. Integrating functions were strengthened by a growing demand for the river's water in the hyper-arid boundary environment. Boundary resurrection comes at a time when South Africa is planning to tap up to 90% of the mean annual run-off of 11,480 million m^3 in the upper basin. Future trends suggest an intensification of irrigation and tourism on both banks of the lower course, but riparian users will have to accept reduced, stringently budgeted allocations of water. (abstract)

Barret, S. 1994. *Conflict and Cooperation in Managing International Water Resources*. Centre for Social and Economic Research on the Global Environment, Vol. Wm 94094. This article is written from the premise that conflicts can arise about shared water resources and the question whether negotiated treaties can ensure that nations which share bodies of water share gains from cooperation. Three case studies are examined, the Columbia River Treaty, the Indus Waters Treaty, and the Convention on the Protection of the Rhine Against Pollution Chlorides. Analysis of game theory is done exploring primarily the Coase Theorem.

Bau, Jao. 1995. Cooperation Among Water Research and Development Institutions of Europe. *Water International* 20: 129–35. This article discusses the problem of environmental degradation in central and eastern Europe. The obstacles facing East-West cooperation are analysed, and Bau presents a programme of cooperation offered by the European Communities Commission.

Baumann, Duane D., John J. Boland, and John H. Sims. 1984. Water Conservation: The Struggle Over Definition. *Water Resources Research* 20 (4, April): 428–34. During the 1970s much attention was focused on the role of water conservation in the planning and management of urban water supplies, and actions to implement water conservation were taken at all levels of government. Yet many policies and programmes appear to rely on conceptions of water conservation which confuse supply and demand oriented strategies or which inefficiently conserve water at the expense of other scarce resources. Through an analysis of the underlying concepts and values, a definition of water conservation is reached which is both precise and practical and which provides a sound basis for the development of water conservation policies. Examples drawn from recent field studies illustrate the application of the definition.

Beaumont, Peter. 1994. The Myth of Water Wars and the Future of Irrigated Agriculture in the Middle East. *Water Resources Development* 10(1): 9–22. Beaumont argues that water tensions will not result in war because irrigation water will be diverted to higher value urban uses before people will fight over crop-watering.

Beckerman, Wilfred. 1992. Economic Growth and the Environment: Whose Growth? Whose Environment? *World Development* 20(4): 481–96. The widespread clamour for immediate draconian action to reduce the danger of global warming is an unjustifiable diversion of attention from the far more serious environmental problems facing developing countries. Resource constraints do not consitute limits to growth, and the likely economic damage done by climate change would be a negligible proportion of world output. The loss of welfare for the population in developing countries today as a result of inadequate access to safe drinking water and sanitation, or of urban air pollution, is far greater, and should be given priority over the interests of future generations. The ''sustainable'' growth concept is either morally indefensible or totally non-operational. (abstract)

Bell, F.C. 1988. The Sharing of Scarce Water Resources. *Geoforum* 19(3): 353–66. Australians have been sensitive about water issues from the beginning, and like the United States, many engineering projects were undertaken in the 1950s and 1960s when a true cost-benefit analysis would not have permitted the projects to go on. The author seeks to prove that the idea of using such a high number of engineering ''fixes'' came from the perception that Australia's water resources were scarce, but that in a physical sense water is not scarce. Economically, water is scarce because of the difficulty of containing and managing it.

Benvenisti, E. and H. Gvirtzman. 1993. Harnessing International Law to Determine Israeli-Palestinian Water Rights: The Mountain Aquifer. *Natural Resources Journal* 33 (Summer): 543–67. Focusing on the question of joint management of the water of the Mountain Aquifer, this article applies the generally accepted principles of international law to a peaceful arrangement regarding the management of this resource. This study is limited to examining the implications of the management of the Mountain Aquifer for only those options which would establish a separate legal entity for the Palestinians of the area, be it an autonomous territory, an independent state, or a Jordanian-Palestinian confederation.

Bercovitch, Jacob. 1992. Mediators and Mediation Strategies in International Relations. *Negotiation Journal* 8 (2, April): 99–112. Discusses kinds of mediation; discusses strategies and behaviour among nations resolving differences and among those trying to help them resolve those differences. The author provides frameworks for possible negotiation strategies as well as some possible actions for the mediator. Ways to evaluate the mediator and success of the negotiations are also offered.

Berthelot, R. 1989. The Multidonor Approach in Large River and Lake Basin Development in Africa. *Natural Resources Forum*, August, 209–15. From the outset of its efforts to promote the socio-economic development of river and lake basins in developing countries, UNDP took the position that in most cases the river basin was the appropriate goegraphical entity for development. However, the amount of technical assistance re-

quired to evaluate the potentialities of a large river or lake basin is beyond the capabilities of any single donor of assistance. Similarly, the capital investment required to implement a basin development programme, ranging from US$ several hundred million to possible US$ several thousand million, is usually beyond the capabilities of any single financial institution. On the basis of the experience gained in the development of the Mekong river and the Senegal river, UNDP advocates concerted and coordinated cooperation among donors interested in different aspects of one given large river or lake basin development, for which it coined the phrase "multidonor approach". (abstract)

Bhatti, Neeloo, David G. Streets, and Wesley K. Foell. 1992. Acid Rain in Asia. *Environmental Management* 16(4): 541–62. Acid rain has been an issue of great concern in North America and Europe during the past several decades. However, due to the passage of a number of recent regulations, most notably the Clean Air Act in the United States in 1990, there is an emerging perception that the problem in these western nations is nearing solution. The situation in the developing world, particularly in Asia, is much bleaker. Given the policies of many Asian nations to achieve levels of development comparable with the industrialized world – which necessitate a significant expansion of energy consumption (most derived from indigenous coal reserves) – the potential for the formation of, and damage from, acid deposition in these developing countries is very high. This article delineates and assesses the emissions patterns, meteorology, physical geology, and biological and cultural resources present in various Asian nations. Based on this analysis and the risk factors to acidification, it is concluded that a number of areas in Asia are currently vulnerable to acid rain. These regions include Japan, North and South Korea, southern China, and the mountainous portions of southeast Asia and southwestern India. Furthermore, with accelerated devlopment (and its attendant increase in energy use and production of emissions of acid deposition precursors) in many nations of Asia, it is likely that other regions will also be affected by acidification in the near future. Based on the results of this overview, it is clear that acid deposition has significant potential to impact the Asian region. However, empirical evidence is urgently needed to confirm this and to provide early warning of increases in the magnitude and spread of acid deposition and its effects throughout this part of the world. (abstract)

Bingham, Gail and Suzanne Goulet Orenstein. 1991. The Role of Negotiation in Managing Water Conflicts. Submitted to American Society of Civil Engineers for publication. This article seeks to address the role of negotiation in solving water resource problems which inevitably in some cases have led to conflict. Starting first with a section entitled Defining Negotiation and Mediation, the authors then turn to the History of Mediation in Environmental Conflicts, Creating Efficient and Effective Problem-solving Processes for Water Conflicts, Requirements for Successful Use of Conflict Resolution Processes, and then concludes with the recommendation that in negotiation one must remember that effective negotiation requires facing the differences that divide groups and developing strategies that allow constructive solutions in spite of those differences.

Biot, Yvan, Piers M. Blaikie, Cecile Jackson, and Richard Palmer-Jones. 1995. *Rethinking Research on Land Degradation in Developing Countries*. World Bank Discussion Papers, Vol. 289. Washington, DC: World Bank. This paper critically reviews the three main approaches to land degradation and conservation – the classic, populist, and neo-liberal. The implications of these paradigm shifts are examined in terms of research needs. Next, the paper discusses the role of science and technology, and the origins and substance of differences in the perception, evaluation, and diagnosis of degradation. Focus is then shifted to analysing how farmers and pastoralists make decisions about resource use and management, and a research approach is suggested for analysing decision-making. Two case studies illustrate the approach. (abstract)

Biswas, Asit K. 1992. Indus Water Treaty: The Negotiating Process. *Water International* 17:

201–09. This paper is an analysis of the negotiating process that resulted in the Indus River Treaty between India and Pakistan. This analysis stems from the issues surrounding arid and semiarid countries international water bodies. Biswas contends that not enough attention has been paid to review the negotiating processes that have led to successful water treaties.

—— 1993. Management of International Waters: Problems and Perspective. *Water Resources Development* 9(2): 167–88. The purpose of this paper is to review objectively some of the major developments on the increasingly critical issue of management of international water resources during the past two decades. It is the author's opinion that the management of international water resources has not received adequate attention in the recent past. He is calling for a change to the current ''softly, softly'' approach by international organizations in dealing with these complex issues.

—— 1995. Institutional Arrangements for International Cooperation in Water Resources. *Water Resources Development* 11(2): 139–45. Three papers were specially commissioned for a Special Session on ''Institutional Arrangements for International Cooperation in Water Resources'' during the 8th World Congress on Water Resources in Cairo, Egypt, in November 1994. The Session also included a panel discussion in which presidents or senior officials from six major water-related professional associations made brief presentations on the desirability of establishing a World Water Council. This paper is a summary of the entire Special Session. (abstract)

Blake, Gerald. 1994. International Transboundary Collaborative Ventures. In *Political Boundaries and Coexistence: Proceedings of the IGU-Symposium, Basle/Switzerland, 24–27 May*, ed. Werner A. Galluser, 359–71. New York, NY: Peter Lang. International boundary studies generally focus upon the delineation and function of boundaries, and their impact upon borderlands and borderlanders. Alternatives to full state territorial sovereignty such as international zones, neutral zones etc. deserve more attention, not least because of their potentially useful role in a world of geopolitical change. Similarly, more systematic evaluation of a whole range of transboundary collaborative ventures should be attempted. As a start, attention is drawn in this paper to the range of such activities, associated with resource management, economic development, transport management, and environmental protection. The focus is upon cases which involve genuine cooperative effort, and which to some degree mean a diminution of national sovereignty in a specific region. An attempt is made to devise a classification of the types of collaboration currently being undertaken in various parts of the world, on land and sea. Finally, consideration is given to the significance of trends towards transboundary cooperation for international boundary studies. (abstract)

Bochniarz, Zbigniew. 1992. Water Management Problems in Economies in Transition. *Natural Resources Forum*, February, 55–63. Ambitious programmes of reform in Central and Eastern Europe (CEE) are threatened by a serious deterioration of the environment. Large-scale damage of the natural environment in many forms, including water pollution has created development barriers which adversely affect the living conditions of current and future generations. Despite similar patterns of environmental policy in the CEE countries compared with their western counterparts, neither environmental legislation nor economic incentives have produced any significant improvement in water quality over the last 10–20 years. For that very reason in the transition period, it is necessary to identify existing deficiencies in the system and to build up a mixed system of new institutions of water management, more realistic legislation with a strong enforcement system, and market-based incentives for water conservation and protection against pollution. (abstract)

Bolin, I. 1990. Upsetting the Power Balance: Cooperation, Competition, and Conflict Along an Andean Irrigation System. *Human Organization* 49(2): 140–48. The purpose of this

study, centred on an Andean irrigation system in Peru, is to show that in-depth research on patterns of social interaction prior to the initiation of a project will achieve greater satisfaction and sustained cooperation among all groups affected by development. This paper examines the effects of a development project which provides a plentiful water supply along an entire canal system done through canal construction and improvement.

Brooks, David B. 1993. Adjusting the Flow: Two Comments on the Middle East Water Crisis. *Water International* 18 (1, March): 35–39. Whereas almost all nations in the Middle East face a chronic problem of water shortage, the riparians of the Jordan River (mainly Israel, Jordan, and Palestine) are close to crisis. To deal with this situation, it is suggested that the emphasis in water management be shifted from supply to demand and from quantity to quality. This approach emulates alternative energy analysis, dubbed the "soft path," which has demonstrated that it is typically economically cheaper and ecologically less damaging to approach problems from the demand than from the supply side. Major opportunities exist to increase efficiency of use in the Jordan river basin, particularly for irrigation, which is by far the main consumer. Other opportunities lie in avoiding the degradation arising from excessive use of pesticides and fertilizers, inadequate treatment of sewage, and industrial dumping. Continuing the analogy with energy, policy analysis should be recast in terms of normative scenarios so as to determine the feasibility and impacts of alternative policies and reactions. All sides see close linkage between water and security. Therefore, only through exploration of alternative futures, not simply protection of the present into the future, can we find ways to minimize the potential for conflict. (abstract)

Bruhacs, J. 1992. Evaluation of the Legal Aspects of Projects in International Rivers. *European Water Pollution Control* 2(3): 10–13. International law involves legal norms relating to the management of international rivers. Therefore there are procedural obligations for the evaluation of possible impacts resulting from projects. This paper attempts to clarify some implied difficulties of this legal regime. (abstract)

Buck, S.J., G.W. Gleason, and M.S. Jofuku. 1993. "The Institutional Imperative": Resolving Transboundary Water Conflict in Arid Agricultural Regions of the United States and the Commonwealth of Independent States. *Natural Resources Journal* 33: 595–628. The hypothesis of this study is that conflict created by disjunction in intranational contexts is resolved through multi-level institutional interaction. The results of the study indicate there is a phenomenon which suggests an "institutional imperative" of maintaining the vitality of subnational and supranational institutions to resolve international transboundary water conflict. The case studies for this report are the arid agricultural regions of the United States and the Commonwealth of Independent States.

Butts, Kent Hughes. 1993. *Environmental Security: What is DOD's Role?* Carlisle, PA: Strategic Studies Institute, U.S. Army War College. When newly appointed Secretary of Defense Les Aspin reorganized his principal staff, he created the position of Deputy Under Secretary of Defense for Environmental Security. The creation of this position draws attention to an issue that has a powerful following in Congress and the current administration – the use of the military for environmental security missions. This study examines important environmental roles and missions currently being executed by the Department of Defense (DOD), provides an assessment of their contributions to national security, and makes recommendations concerning DOD's future environmental peactime role. (abstract)

Calleros, J. Roman. 1991. The Impact on Mexico of the Lining of the All-American Canal. *Natural Resources Journal* 31 (Fall): 829–38. This article, written from Mexico's perspective, urges Mexico to take a strong position in opposing the proposed lining of the All-American canal. If this project is developed, the groundwater recharge will be significantly reduced affecting 121 wells in Mexico and more than 33,000 acres of farmland.

Cano, Guillermo. 1989. The Development of the Law in International Water Resources and the Work of the International Law Commission. *Water International* 14: 167–71. Provides an overview of international law, including NGOs.

Capistrano, Ana Doris and Clyde F. Kiker. 1995. Macro-scale Economic Influences on Tropical Forest Depletion. *Ecological Economics* 14 (1, July): 21–29. The paper examines the influence of global and domestic factors on forest depletion in 45 tropical developing countries from 1967 to 1985. It links forest depletion with conditions in the international markets and with domestic macroeconomic and demographic factors. Calculated elasticities suggest that real exchange rate devaluation, debt service, food self-sufficiency, income, and export prices of forestry and agricultural output had significant influence on the depletion of tropical forests during the study period. (abstract)

Caponera, Dante A. 1987. International Water Resources Law in the Indus Basin. In *Water Resources Policy for Asia*, ed. Mohammed Ali et al. Boston, MA: A.A. Balkema. Discusses Indo-Pakistani/Indo-Bangladeshi water disputes, and the international agreements between states. Caponera emphasizes the need for multilateral negotiations.

—— 1993. Legal Aspects of Transboundary River Basins in the Middle East: The Al Asi (Orontes), the Jordan, and the Nile. *Natural Resources Journal* 33: 629–63. This article presents an analysis of the legal situation of three international river basins in the Middle East: the Al Asi (Orontes), the Jordan, and the Nile. This analysis is used to determine the rights and obligations of the co-basin states to the waters available in each basin. The rivers were chosen for this study because of their similarity in being located in an arid area. Caponera tentatively presents regional or local solutions for cooperative arrangements from the legal standpoint.

Chaube, U.C. 1990. Water Conflict Resolution in the Ganga-Brahmaputra Basin. *Water Resources Development* 6(2): 79–85. This article analyses interstate water disputes within India and the conflict over sharing of water between India and Bangladesh over the Ganga-Brahmaputra basin. This was done using a simplified two-level decomposition – coordination study of the Indo-Nepal region of the Ganga basin.

—— 1992. Multilevel Hierarchical Modelling of an International Basin. In *Proceedings of the International Conference on Protection and Development of the Nile and Other Major Rivers,* Vol. 2/2. International Conference on Protection and Development of the Nile and Other Major Rivers. Cairo, Egypt, 3–5, February. This article discusses the results of a simplified two-level decomposition-coordination study of the Indo-Nepal region of the Ganga basin which was conducted using deterministic linear programming models to provide a scientific basis for resolution of conflicts and explanation of interlinkages. The issues for study of the Ganga-Brahmaputra water resources (GBWR) system is viewed in terms of the geopolitical, temporal and goal/functional requirements and multiplicity of independent decision authorities.

Chitale, M.A. 1995. Institutional Characteristics for International Cooperation in Water Resources. *Water Resources Development* 11(2): 113–23. There has been a steady evolution in the arrangements for cooperation in the management of international river basins over the last two centuries. Rather than aiming at a standardized set-up for all the international river basins, basin organizations can best be allowed to grow in phases according to the emerging needs of the respective basins. The river basin organizations and regional water management bodies will need a global common platform for exchanging their experiences and for developing common global strategies. A World Water Council can provide such an umbrella set-up with its General Assembly comprising international basin entities, regional bodies, international professional associations, and the UN agencies dealing with water. (abstract)

Clarke, R. 1991. *Water: The International Crisis*. London: Earthscan. Describes the world's freshwater shortage and examines both the economic and political factors which have led

to it, then discusses how climatic conditions and poverty, leading to poor land management and overpopulation, have contributed to water scarcity. Many of the world's major rivers, including the Rhine, Danube, Nile, and Niger meet the water requirements of several countries, however, agreements for managing these supplies are, in many cases, fragile. The author considers the possibilities of international conflict over water control and outlines the effect of water availability on development in poor countries. The book concludes with a number of solutions, both traditional and technological, which could lead the way towards ensuring world water security. (M.Z. Barber)

Cohen, Saul B. 1992. Middle East Geopolitical Transformation: The Disappearance of a Shatterbelt. *Journal of Geography* 91 (1, January/February): 2–10. The Cold War's end has brought about major global geopolitical restructuring. It is also cause for regional geopolitical reordering. The Gulf War and its aftermath are but one expression of Middle Eastern disequilibrium. This shatterbelt region has been caught up in both intraregional tensions and the post-World War II history of competition between the Maritime and Eurasian continental realms. Now the Middle East is becoming strategically reoriented to the West. While powerful centrifugal forces still prevail, the reduction of external competitive pressures permits centripetal forces to become more salient. In addition to Arabism and Islan, these include migration and capital flows and water and oil transportation lines. A new balance among the Middle East's six regional powers can be fostered but not dictated by the outside world. Equilibrium can best be promoted, not by a Pax Americana, but by the United States and the European Community acting as two competitive but allied stabilizers. (abstract)

Conant, M.A. 1990. The Middle East Agenda. *Geopolitics of Energy* 12(6): 3–7. Change has come to key relationships in the Gulf as a consequence of the Iraqi-Iranian stalemate, the suspected ambitions of Hussein, and the return of Egypt to prominence among Arab states. An Iran-Iraq war is still a concern for regional relationships as there are worries about Iraqi intentions. Other factors discussed included the position of Saudi Arabia and Kuwait, the oil price policy, nuclear weapons availability, regional stability, and political change, as well as internal disputes over water, and trade and relations with the ''Superpowers.'' (abstract)

Crane, M. 1991. Diminishing Water Resources and International Law: U.S.-Mexico, A Case Study. *Cornell International Law Journal* 24(2): 299–323. The objective of this study is to illustrate the need to improve the international legal regime governing transboundary groundwater. This is achieved by analysing the recent dispute between the United States and Mexico over shared groundwater resources. Included is a presentation of the applicable international law, an explanation of why the customary international law of groundwater is in such a rudimentary stage, an application of the definitive international environmental law to the US-Mexican dispute, concluding by borrowing from US domestic law to resolve the dispute between Mexico and the US.

Crow, B. and A. Lindquist. 1990. Development of the Rivers Ganges and Brahmaputra: the Difficulty of Negotiating a New Line. *DPP Working Paper – Open University* 19: 1–46. Periodic floods making international news are only one symptom of the untamed state of the major rivers of South Asia. With the declaration of the 1989 Group of Seven Summit, and subsequent agreement on an Action Plan for Floods in Bangladesh, some taming is now planned. The slow development of irrigation and of hydroelectric power in the region nevertheless remains a major factor keeping living standards low in an area with perhaps the largest concentration of poverty in the world. Disagreement between the governments of India and Bangladesh constitutes a serious constraint contributing to that slow pace of development. This paper examines the last major round of negotiations. New ideas on both sides and a thorough re-evaluation by a group in the Bangladesh government brought the negotiators close to agreement. The paper indicates the need for interdisciplinary perspectives on international development negotiations. (abstract)

Cummings, R.G. and V. Nercissiantz. 1992. The Use of Water Pricing as a Means for Enhancing Water Use Efficiency in Irrigation: Case Studies in Mexico and the United States. *Natural Resources Journal* 32: 731–55. The purpose of this article is to examine the role of water markets in enhancing irrigation water use efficiency. Particular concern in this paper was focused on water pricing as a means for improving water use efficiency in irrigation. The authors explore a number of alternative ways in which water prices might be used to provide farmers with incentives to collaborate in programmes to enhance efficiency. These issues are examined in the context of the case studies of Mexico and the United States.

Curtuis, M. 1995. More Contentious Than West Bank is Resource Below: Water. *Los Angeles Times*, Saturday, 15 July. This newspaper article is an exploration of the dispute over water between Israel and Palestine.

Day, R. and J.V. Day. 1977. A Review of the Current State of Negotiation Order Theory; an Appreciation and a Critique. *The Sociological Quarterly* 18 (Winter): 126–42. It is argued that the theory of negotiated order, which has remained largely submerged within a series of fairly specific ''grounded'' case studies of occupations, professions, and complex organizations in the health field, has a number of attractive qualitites to it. As such, it represents one of the more exciting recent developments in the study of organizations. The present paper examines the more recent historical origins of the theory, summarizes its major points, and critically assesses its strengths and weaknesses. Since most of the substance of the theory is found in studies of health professionals working in hospital settings, the examples used here are also derived from this particular body of literature. Some future possible directions which we believe will improve the overall explanatory power of the perspective are presented in the concluding section. (abstract)

Delli Priscoli, Jerome. 1988. Conflict Resolution in Water Resources: Two 404 General Permits. *Journal of Water Resources Planning and Management* 114 (1, January): 66–77. The use of alternative dispute resolution techniques in water resources is demonstrated and experience evaluated against current theory of bargaining and negotiating. Conflicts among environmentalists, developers, and government agencies are well known; they involve planning, constructing, operating, and regulating water-resources projects. Two Section 404 permit cases are compared. One in 1980, involves issuing a general permit (GP) for wetland fill on Sanibel Island, Florida. The other, in 1987, involves issuing a GP for hydrocarbon exploration drilling throughout Louisiana and Mississippi. Generally, permits are granted on a case-by-case basis, but Corps district engineers may also issue GPs for activities that produce no negative cumulative impacts. In these cases the Corps adopted a revolutionary approach to GPs. Rather than writing the permit in-house, the Corps suggested that the parties who conflict over permit applications get together and write the technical specification for a GP. The Corps told environmentalists, citizens, contractors, industrialists, developers, and representatives of government agencies if they agree to the specifications of a permit within the broad legal constraints of the 404 law, the Corps would confirm the agreement and call it a GP. The price of such an agreement is consensus among the parties normally in conflict over permit applications. In this way the Corps becomes the facilitator of consensus among interested parties by using its authority. The Sanibel permit operated unchallenged for five years, the legal life of such a permit. The Mississippi/Louisiana permit was just issued. These cases both confirm and question some propositions emanating from the fields of negotiating and bargaining. (abstract)

—— 1989. Public Involvement, Conflict Management: Means to EQ and Social Objectives. *Journal of Water Resources Planning and Management* 115 (1, January): 31–42. Engineers, scientists, and even some social scientists prefer to look at water resources planning and management as primarily analytical. However, more and more of the water professionals' analytical work depends on people-oriented techniques either to relate their activities to outside interests or to build better internal team relationships. Frequently, the major problems that engineers and scientists face are not technical. They are problems of

reaching agreement on facts, alternatives, or solutions. Public involvement and conflict management techniques are key to servicing such needs. After briefly describing public involvement and conflict management techniques, seven observations on why incorporating social and environmental objectives into water resources planning and management require these process techniques are presented. (abstract)

Derman, Bill and Anne Ferguson. 1995. Human Rights, Environment, and Development: The Dispossession of Fishing Communities on Lake Malawi. *Human Ecology* 23 (2, June): 125–42. In a growing number of cases throughout Africa, communities' resource bases are being undermined or appropriated by outsiders, a process which seriously threatens the continuation of local cultures and livelihoods. In this article, we use a political ecology framework to examine how the linked processes of economic development, political power, and environmental change are transgressing the rights of fishing communities on the shores of Lake Malawi. In the cases described, these communities, or community members within them, find themselves powerless to prevent the expropriation of the resources over which they previously had either legal or customary control. Thus, it is not the economic processes of dispossession alone which lead to human rights violations but rather dispossession combined with an authoritarian political context. (abstract)

Deshan, T. 1995. Optimal Allocation of Water Resources in Large River Basins: I, Theory. *Water Resources Management* 9: 39–51. The purpose of this paper is to present the techniques of optimal allocation of water resources (OAWR) and to demonstrate how these methods can be employed in practice for studying both simple and complex water resources problems. Used as an application, the techniques and methods are applied to the OAWR of the Yellow river basin.

—— 1995. Optimal Allocation of Water Resources in Large River Basins: II, Application to Yellow River Basin. *Water Resources Management* 9: 53–66. This paper is an application of the theoretical approach of the optimal allocation of water resources in large river basins to the Yellow river basin. The objective of using a case study is to attain the optimization of water allocation to achieve the maximum national economic benefits and the optimal reservoir storage required to maintain the long-term balance of water resources.

Devlin, John F. 1992. Effects of Leadership Style on Oil Policy. *Energy Policy*, November, 1048–54. Neighbours, with similar systems of government and sharing a common ideological origin, Syria and Iraq have none the less had markedly different oil histories since 1980. Syria's oil production has tripled since 1982; Iraq's has yet to return to the 3.5 million barrels per day it reached in 1979 and 1980. The reason lies in their markedly different leadership. Asad in Syria has, in his patient, cautious style, virtually eliminated the country's reliance on oil or oil product imports; oil exports are earning substantial sums annually. Saddam Hussain in Iraq, ambitious to make himself and his country leaders in the Arab world, has made a series of decisions having disastrous consequences for Iraq's oil industry – invasion of and war with Iran, seizure of Kuwait, and rejection of UN terms for resumption of oil exports. Contrary to conventional wisdom, he has not authorized exports despite his country's real need for the earnings they would bring. (abstract)

Dewitt, David. 1994. Common, Comprehensive, and Cooperative Security. *The Pacific Review* 7(1): 1–15. An overview of the changing idea of security to one not dependent on military hardware or nuclear deterrence.

De Silva, K.M. 1994. Conflict Resolution in South Asia. *International Journal on Group Rights* 1(4): 247–67. South Asia has some of the most intractable political conflicts in the world today, and at three levels: international, national, and subnational. Conflict resolution in South Asia has three unusual features, beginning with the Sino-Indian dispute over their common border along the Himalayas. Second, the principal asymmetrical feature of the South Asian political system, the overwhelming dominance of India, makes multilat-

eral negotiations over issues that involve India's vital interests. Third, separatist agitation, politicized religion and ethnic conflicts disturb the peace in many parts of South Asia. Potential conflicts of the future include disputes over the sharing of scarce resources, especially water and irrigation works; and the problem of refugees and displaced persons arising from the region's many disputes, as well as its problem of severe overpopulation. (abstract)

Dinar, Ariel, P. Seidl, H. Olem, V. Jorden, A. Duda, and Johnson R. 1995. *Restoring and Protecting the World's Lakes and Reservoirs*. (Technical Paper Number 289). Washington, DC: World Bank. The purpose of this report is to call on specialized UN agencies and other international support organizations and governments to take the necessary actions to make development activities more sustainable with regard to lakes and reservoirs. Aspects of threats to beneficial uses, ecosystem degradation as well as economics, regulations, institutions, and a comprehensive approach to managing, protecting, and rehabilitating lakes and reservoirs are examined. A series of 14 lake pollution and restoration case studies are included as appendixes to the paper.

Dorman, S. 1991. Who Will Save the Aral Sea? *Environmental Policy Review* 5(2): 45–54. The purpose of this article is to examine the problems facing Central Asia and Kazakhstan, economic, social, and environmental. The author's position is that many of these problems have been caused, at least in part, by the water management policies implemented in the region. Dorman suggests that a review of the literature indicates that the Central Asians and the Kazakhs believe that it is Moscow's responsibility to solve the water-resources problem in the region.

Druckman, D. 1993. The Situational Levers of Negotiating Flexibility. *Journal of Conflict Resolution* 37(2): 236–76. This study was conducted by examining the effects of a number of situational variables on decisions to be flexible or inflexible in a simulation of an international negotiation on the regulation of gases contributing to the depletion of the ozone layer. Druckman created four negotiating-stage scenarios using a combination of variables. The experiment was conducted using two international samples, one group of scientists, the other of diplomats from different countries.

Drysdale, A. 1992. Syria and Iraq – the Geopathology of a Relationship. *GeoJournal* 28(3): 347–55. The decision by Syria to support the anti-Iraq coalition during the Gulf War has to be understood within the wider political geographic and historical regional context. Mutual feelings of territorial injury in the demarcation of the states' territory and centrifugal forces threatening the continued integrity of the state, intense ideological and territorial disputes have resulted in bitter interstate enmity. Disputes have arisen over Syrian closure of Iraqi oil pipelines, the allocation of water flowing from the Euphrates and Syrian support of Iran during the Iraq-Iran war. The collapse of Syria's superpower ally, the Soviet Union, resulted in Syria supporting the anti-Iraq international coalition during the 1991 Gulf War, in an attempt to regain wider international legitimacy. (abstract)

Dryzek, John S. and Susan Hunter. 1987. Environmental Mediation for International Problems. *International Studies Quarterly* 31: 87–102. Environmental mediation has found some success as a mechanism for dispute settlement and problem solving in domestic settings. The prospects for its application in the international polity are explored here in the context of both localized transboundary issues and global environmental problems. Though facing a formidable set of necessary conditions, international environmental mediation could prove efficacious. Indeed, mediation offers one of the few methods for coping with environmental problems that retains the essentially decentralized character of the contemporary international political system. (abstract)

Dudley, N.J. 1992. Water Allocation by Markets, Common Property and Capacity Sharing: Companions or Competitors? *Natural Resources Journal* 32 (Fall): 766–78. This article explores the concept of capacity sharing, a new way of defining and allocating rights to

flowing and stored surface water in a river valley. Also explored, as a point of comparison, is the literature on common property approaches to resource management.

Dudley, R.L. 1990. A Framework for Natural Resource Management. *Natural Resources Journal* 30 (Winter): 107–22. The actual practice of setting up multiple-use natural resource management on federal lands has been a case of "muddling through." No overall theoretical rationale exists on a nationwide basis. However, it is possible to envision a theoretical framework for managing natural resources based on a political economy paradigm of market failure/government failture. This paper proposes such a framework involving three parts. The first identifies resources and areas best served by private ownership or by public ownership. The second identifies principles and standards which would guide management. The third develops the bureaucracy needed to set up and manage the identified areas. The paper also looks at theoretical requirements for effective implementation of the proposed framework. (abstract)

Dufournaud, Christian. 1982. On the Mutually Beneficial Cooperative Scheme: Dynamic Change in the Payoff Matrix of International River Basin Schemes. *Water Resources Research* 18(4): 764–72. Utilizing metagame theory (game theory not dependent on rational behaviour of those involved), the author addresses the point at which one party will leave the agreement because it is advantageous at that point.

Dworsky, L.B. and A.E. Utton. 1993. Assessing North America's Management of its Transboundary Waters. *Natural Resources Journal* 33 (Spring): 413–59. This report is a summarization of the results and recommendations of a project entitled "The North American Experience Managing International Transboundary Water Resource: International Joint Commission and the International Boundary and Water Commission." This article presents nine issues the authors feel are of overriding importance to prepare the International Joint Commission (US-Canada) and the International Boundary and Water Commission (US-Mexico) for future challenges of change due to population growth, industrialization, greater demands on jointly owned resources, and shifting trading patterns.

Eagleson, Peter S. 1986. The Emergence of Global-Scale Hydrology. *Water Resources Research* 22 (9, August): 6S–14S. Emerging problems of environmental change and of long-range hydrologic forecasting demand knowledge of the hydrologic cycle at global rather than catchment scale. Changes in atmosphere and/or landscape characteristics modify the earth's metabolism through changes in its biogeochemical cycles. The most basic of these is the water cycle which directly affects the global circulation of both atmosphere and ocean and hence is instrumental in shaping weather and climate. Defining the spatial extent of the environmental impact of a local land surface change, or identifying, for forecasting purposes, the location and nature of climatic anomalies that may be casually linked to local hydrologic persistence requires global scale dynamic modelling of the coupled ocean-atmosphere-land surface. Development, evaluation, verification, and use of these models requires the active participation of hydrologists along with a wide range of other earth scientists. The current state of these models with respect to hydrology, their weaknesses, data needs, and potential utility are discussed. (abstract)

Eden, S. 1988. Negotiation and the Resolution of Water Allocation Disputes. M.Sc. thesis. Tucson: University of Arizona. Negotiation as a process for resolving water allocation disputes has advantages and disadvantages with respect to other dispute resolution methods. The principal advantages are derived from direct participation of interested parties. The chief disadvantages are that it cannot produce agreement in all conflicts and that such agreements as are reached may not adequately consider the public interest. No satisfactory method was found to evaluate the public interest content of negotiated settlements, although several paradigms are examined. Instead, the public interest was assumed to receive adequate protection in negotiations when all the parties with a stake in the outcome participate or are represented. (abstract)

El-Yussif, Faruk. 1983. Condensed History of Water Resources Development in Mesopotamia. *Water International* 8: 19–22. El-Yussif begins with water projects in Mesopotamia from 1900 BCE and continues forward.

Falkenmark, Malin, J. Lundqvist, and C. Widstrand. 1989. Macro-scale Water Scarcity Requires Micro-scale Approaches: Aspects of Vulnerability in Semi-Arid Development. *Natural Resources Forum* (November): 258–67. This paper shows that water scarcity is a complex problem when it affects countries with a semi-arid climate, ie countries for which there are fluctuations between a dry season and a season when rain occurs. The paper discusses the general vulnerability of the semi-arid zone in terms of four different types of water scarcity, the effects of which are being superimposed on each other: two are natural (type A, arid climate, type B, intermittent drought years) and two are man-induced (type C, desiccation of the landscape driven by land degradation, and type D, population-driven water stress). When fuelled by a rapid population increase, a risk spiral develops, manifesting itself in social and eoncomic collapse during intermittent drought years. The paper concludes that many countries in Africa are heading for severe water scarcity – in fact two-thirds of the African population will live in severely water-stressed countries within a few decades. This severe water stress will largely be the result of unfettered population growth. (abstract).

Fashchevsky, B. 1992. Ecological Approach to Management of International River Basins. *European Water Pollution Control* 2(3): 28–31. The problems of an ecological approach to water-resources utilization of transboundary rivers are discussed in this report. The need for consideration of ecological factors, particularly qualitative ones, is illustrated by a number of river basins. The importance of water regime and floodplain for a river's life and the need to consider these factors in water resources management are pointed out. Methods are suggested for ecological flow assessment in different flow probability years. (abstract)

Fearnside, Philip M. 1993. Deforestation in Brazilian Amazonia: The Effect of Population and Land Tenure. *Ambio* 22 (8, December): 537–45. LANDSAT data for 1978, 1988, 1989, 1990, and 1991 indicate that by 1991 the area of forest cleared had reached 426,000 km^2 (10.5% of the 4 million km^2 originally forested portion of Brazil's 5 million km^2 Legal Amazon Region). Over the 1978–1988 period, forest was lost at a rate of 22,000 km^2 yr-1 (including hydroelectic flooding), while the rate was 19,000 km^2 yr-1 for 1988–1989, 14,000 km^2 yr-1 for 1989–1990 and 11,000 km^2 yr-1 for 1990–1991. The reduction in the rate since 1987 has mostly been due to Brazil's economic recession rather than to any policy changes. The number of properties censused in each size class explains 74 per cent of the variation in deforestation rate among the nine Amazonian states. Multiple regressions indicate that 30 per cent of the clearing in 1991 can be attributed to small farmers (properties <100 ha in area), and the remaining 70 per cent to either medium or large ranchers. The social cost of reducing deforestation rates would therefore be much less than is implied by frequent pronouncements that blame ''poverty'' for environmental problems in the region. (abstract)

Fishelson, Gideon. 1992. Solutions for the Scarcity of Water in the Middle East in Times of Peace. In *Kfar Blum Conference*. Kfar Blum Conference. Tel Aviv: Armand Hammer Fund for Economic Cooperation in the Middle East, December. Tradeable water rights/permits only occur at the local level, whereas nations use a quota system for water allocations. The author addresses water sharing, cooperation, conservation and augmentation.

Fisher, Franklin M. 1993. An Economic Framework for Water Negotiation and Management. Massachusetts Institute of Technology, 7 November. The author has created a proposal, broken into small sections and based on economic analysis, to mitigate water conflicts. He discusses Resource Allocation, Negative Externalities, Joint Management, National Water Policies, and Property Rights.

Flack, J.E. and D.A. Summers. 1971. Computer-Aided Conflict Resolution in Water Resource Planning: An Illustration. *Water Resources Research* 7(6): 1410–14. The computer system illustrated in this article is called Cognograph. It is used to make explicit to water planners their sources of agreement and disagreement and to aid them in resolving their difference. The authors contend that conflict analysis that uses an interactive computer graphics system holds promise of helping decision-makers resolve the judgemental differences that arise in the planning process.

Flatters, Frank and Theodore Horbulyk, M. 1995. Water and Resource Conflicts in Thailand: An Economic Perspective. Prepared for Natural Resource and Environment Program, Thailand Development Research Institute, April. This paper, from the economist's perspective, is a study on recent conflicts over the use of water in Thailand. The examples used were drawn from case studies commissioned by the Natural Resources and Environment Program of the Thailand Development Research Institute (TDRI) for its study of water and resource conflict. A number of the important water-resource issues such as the allocation of surface and groundwater within and between river basins; and water quality and the discharge of effluent are surveyed in this paper. The paper concludes with suggesting some data and research needs that must be met to speed the adoption of economic criteria and instruments to resolve water use conflicts.

Flint, C.G. 1995. Recent Developments of the International Law Commission Regarding International Watercourses and Their Implications for the Nile River. *Water International* 20(4): 197–204. The International Law Commission of the United Nations has recently presented a set of Rules on the Non-Navigational Uses of International Watercourses to the General Assembly for approval. This article evaluates the potential implications of this new legal regime for the unusual but important case of the Nile river, which is dominated by the strength and control of its furthest downstream state, Egypt. The relationship between upstream and downstream riparian states is critical in determining the applicability of any new legal regime as is shown by the Nile river example. This article begins with a presentation and evaluation of the International Law Commission's new legal framework for international watercourses with primary focus on the General Principles. Following an evaluation of these principles, the international situation of the Nile river is described, illuminating the need for new legal solutions to historically troublesome water conflicts. The article concludes with an evaluation of the potential implications of the International Law Commission's Rules on the Non-Navigational Uses of International Watercourses for the Nile River and more broadly for international water law in general. (abstract)

Folk-Williams, J.A. 1982. Negotiation Becomes More Important in Settling Indian Water Rights Disputes in the West. *Resolve* (Summer): 1–5. The US Department of the Interior announced it would negotiate all pending disputes over Native American water rights and forego litigation. The author examines the role of the federal government and discusses several concepts of water rights such as the Winters Doctrine and reserved water rights.

—— 1988. The Use of Negotiated Agreements to Resolve Water Disputes Involving Indian Rights. *Natural Resources Journal.* 28 (Winter): 63–103. The purpose of this article is to summarize key problems and offer suggestions about negotiation processes that might be helpful to parties considering or engaged in negotiating Indian water cases. Also emphasized is that each case must be examined independently before a judgement is reached on whether or not negotiation can be used successfully.

Forster, Bruce. 1989. The Acid Rain Games: Incentives to Exaggerate Control Costs and Economic Disruption. *Journal of Environmental Management* 28 (4, June): 349–60. This paper contends that the lack of developments in acid rain control in the United States may be approached by considering Hartle's Intersection of Games: the special interest group game; the political game; and the bureaucratic game. The special interests groups – electric utilities, coal companies, coal miners and electricity consumers in the mid-west and

east – have an incentive to emphasize scientific uncertainty of benefits of control while exaggerating the costs of control and economic disruption that would result in order to avoid or at least delay any legislation that would reduce their economic welfare. It is shown in this paper, using estimates from various sources, that the cost and disruption is not as firm as the opponents claim. The views of the politicians are consistent with the special interests for the regions they represent, but couch their opposition in the more altruistic sounding argument that benefits are uncertain while costs are high and known. The scientists and bureaucrats may also be caught in a bureaucratic game in which research activity is forced to justify policy positions rather than improve knowledge. This paper concludes using an insurance analogy that the various uncertainties provide a reason for acid rain control action rather than inaction in order to avoid potential irreversibilities associated with acid rain impacts. (abstract)

Fox, Irving K. and David LeMarquand. 1979. International River Basin Co-operation: The Lessons from Experience. *Water Supply and Management* 3: 9–27. This article is based on a report prepared for the United Nations Secretariat in which 10 case studies of successful arrangements for managing and using international water resources were summarized and assessed to provide a basis for arriving at some conclusions about how to create constructive action, to manage and utilize international water resources efficiently and fairly. In addition, drawing upon the experiences reported in the papers found in the Appendix, the authors attempt to illustrate how cooperative action has been achieved and the kinds of institutions which have facilitated cooperative action. The concluding section is a summarization of the kinds of measures and institutional arrangements that experience suggests will foster the best use of international water resources.

Fox, Jefferson, John Krummel, Sanay Yarnasarn, Methi Ekasingh, and Nancy Podger. 1995. Land Use and Landscape Dynamics in Northern Thailand: Assessing Change in Three Upland Watersheds. *Ambio* 24 (6, September): 328–34. This study analysed human-induced loss and fragmentation of tropical forests in three upland watersheds in northern Thailand between 1954 and 1992. During this 38-year period, forest cover declined, agricultural cover increased, population and population density grew, and agriculture changed from subsistence to cash crops. These changes resulted in a spatially diverse landcape with implications for biological and cultural diversity, sustainable resource use, and the economic conditions of the region. By qunatifying the spatial and temporal patterns of tropical forest change, we have attempted to show how the landscape in these upland tropical forests is controlled by physical and biological, as well as social and economic, parameters. The study illustrates the hierarchy of temporal and spatial events that result in global biome changes. (abstract)

Frankel, N. 1991. Water and Turkish Foreign Policy. *Political Communication and Persuasion* 8: 257–311. This study examines Turkish perspectives on water management and the influence of water on Turkish domestic and foreign affairs. The purpose of Turkey's water management projects and their influence on Turkish relations with her neighbours are specific issues addressed in the article.

Fraser, N.M. and K.W. Hipel. 1984. *Conflict Analysis: Models and Resolutions, Series Volume 11*. New York, NY: North-Holland. Chapter 2, Garrison Diversion Unit is a large water-resources project in North Dakota that may eventually cause environmental damage in Canada and also in the United States. The purposes of this chapter are to provide a comprehensive example of a complex conflict study and thereby introduce some important considerations and features in conflict analysis. The authors contend to show how risk can be realistically considered in the conflict analysis of environmental controversies. Chapter 7, Computer Assistance in Conflict Analysis, presents algorithms for outcome removal which were implemented in FORTRAN and APL. An analysis of the Popular River conflict using the Conflict Analysis Program (CAP) is performed.

—— K.W. Hipel, J. Jaworsky, and R. Zuljan. 1990. A Conflict Analysis of the Armenian-

Azerbaijani Dispute. *Journal of Conflict Resolution* 34 (3, December): 652–77. The authors use a computer program to research the conflict models the authors created. The authors give a history of the conflict 1905–1990, their analysis of the conflict, and the computer-generated equilibria for their model.

Frederick, K.D. 1993. *Balancing Water Demands with Supplies, The Role of Management in a World of Increasing Scarcity*. (Technical Paper Number 189). Washington, DC: World Bank. This paper deals with how to balance water demands with supplies. The experience of OECD countries are examined. While one cannot apply the exact same management practices to all water demand problems, the author suggests that the principles described should be considered a value to those who wish to introduce demand management techniques into their nation's water equation.

Frederiksen, H.D. 1992. *Water Resources Institutions: Some Principles and Practices*. (Technical Paper Number 191). Washington, DC: World Bank. This article examines the history and state of resources development of variations in application of particular situations by water resources institutions. The nation's institutions are defined by the author as laws, customs, organizations, and all that is associated. This article summarizes the principles followed by many countries in dealing with the situations they are confronting.

—— 1996. Water Crisis in the Developing World: Misconceptions About Solutions. *Journal of Water Resources Planning and Management* (March/April): 79–87. The premise of this article is that there are severe consequences of the international community's confined perspectives on solutions of the water crisis in the developing world. Frederiksen suggests that there are four constraints that are inadequately considered in the debate dealing with the water crisis: (1) scarce time to act to meet the pending needs; (2) the limited measures available for securing essential water supplies; (3) the competing demands for funds to provide the means; and (4) minimal ability to manage unpredicted droughts. The case study used to show these consequences is India's Sardar Sarovar project.

Frey, Fred W. 1993. The Political Context of Conflict and Cooperation Over International River Basins. *Water International* 18(1): 54–68. The purpose of this article is to present a power-analytic framework and some initial steps toward such a theory. Examined in this paper are the basic concepts of conflict and cooperation, contributions of international law, and the best known typologies of conflict. Analysis is also included of the actors involved, relevant motivational factors, perceptual (cognitive) processes, and features of power structures. The setting for the application are examples from the Middle East.

Frisvold, George B. and Margriet F. Caswell. 1994. Transboundary Water Agreements and Development Assistance. International Conference on Coordination and Decentralization in Water Resources Management. Rehovot, Israel, 3–6 October. This paper considers the impact of international development assistance on transboundary water transfer and pollution abatement agreements. Section two of this paper presents an example of two countries applying for an assistance grant to develop jointly surface water resources and reduce water pollution. A game-theoretic model was developed to represent the negotiations of countries over the particulars of the development plan. In section three, the model results are used to examine how the bargaining outcome is affected. Section four examines the impact of how allocation of water rights or environmental regulations affect the distribution of gains from bargaining. Section five considers how alternative opportunities and pre-existing development plans affect optimal grant programme design.

Galtung, Johan. 1994. Coexistence in Spite of Borders: On the Borders in the Mind. In *Political Boundaries and Coexistence: Proceedings of the IGU-Symposium, Basle/Switzerland, 24–27 May*, ed. Werner A. Galluser, 5–14. New York, NY: Peter Lang. The basic thesis of the paper is that as geographical, political borders are gradually losing their significance, for many places in the world the borders in the mind, based on the nation (which in turn is based on culture and particularly the macro-cultures known as civilizations) become more

salient. Concretely this means that goods and services, labour and capital, people and ideas will flow across old borders, but mainly within the same culture. At that point new goegraphical borders will rapidly increase in salience, defining super-states harbouring super-nations. An example is, of course, the European Union based on Catholic-Protestant Christianity and Latin-Germanic languages. Similar developments will probably take place in Orthodox-Slavic and Muslim-Turkish regions. The paper then discusses the problems that arise when such nations see themselves as chosen by God (and others as chosen by the Devil), and indicates some possible solutions. (abstract)

Gleick, Peter. 1992. Effects of Climate Change on Shared Fresh Water Resources. In *Confronting Climate Change*, ed. I.M. Mintzer, 127–40. Cambridge University Press, for Stockholm Environment Institute. Climate change will not only affect the level and location of the seas. It will also alter the timing, and distribution of precipitation and runoff – the renewable sources of freshwater on which human societies and natural ecosystems depend. The paper analyses the implications of general circulation modelling experiments for rainfall, soil moisture, and streamflows, and notes that the potential impacts in some regions may be severe. Growing populations may add more demand for this water. These effects may be particularly important where two or more nations depend heavily on shared rivers or lakes. Where water resources are already tightly stretched, freshwater availability could become a military security development for some struggling nations. Even if climate change does not take place, concerns over shared water resources will probably become an increasingly important part of international relations in the future. Minimizing potential damage and conflict will require changes in water management strategies, improved water efficiencies (in supply and use), and a systematic evolution of international strictures on military/environmental aggression. Ultimately, sharing water resources will require unprecedented levels of regional cooperation. (Editor)

—— 1992. *Water and Conflict*. Environmental Change and Acute Conflict, Vol. 1. Toronto, Canada: University of Toronto and the American Academy of Arts and Sciences. Gleick's article of 1993 (below) is a modification and updated version of this paper.

—— 1993. Water and Conflict: Fresh Water Resources and International Security. *International Security* 18(1): 79–112. This article explores the relationship between water resources and international security. The author provides ways in which water resources have historically been the objectives of interstate conflict and how they have been used as instruments of war. Several quantitative indices for measuring the vulnerability of states to water-related conflict are presented. The sections of this paper include: Environment, Resources, and International Security; The Geopolitics of Shared Water Resources; Resource Inequities and the Impacts of Water Developments; Future Conflicts over Water; Indices of Water-resources Vulnerability; Reducing the Risks of Water-Related Conflicts; and Conclusions.

—— 1993. Water and War in the Middle East. Briefing for U.S. Congress. Washington, DC: Energy and Environmental Study Institute, 5 November. A relatively general briefing for the US Congress. Discusses water as a flashpoint (along with other related tensions) in the Middle East.

—— 1993. *Water in Crisis: A Guide to the World's Fresh Water Resources*. New York, NY: Oxford University Press. This book is a guide to the world's freshwater resources providing background information on critical water issues and water data on both global and regional scales. This volume consists of nine essays on freshwater issues by various authors: An introduction to global freshwater issues; World freshwater resources; Water quality and health; Water and ecosystems; Water and agriculture; Water and energy; Water and economic development; Water, politics, and international law; and Water in the 21st century. Data are also included on a variety of subjects: global and regional fresh water resources; rivers, lakes, and waterfalls; sanitation and water-related disease; water

quality and contamination; water and agriculture; water and ecosystems; water and energy; water and human use; water policy and politics; and units, data conversions, and constants.

—— 1994. Water, War and Peace in the Middle East. *Environment* 36 (3, April): 6–42. The purpose of this article is to explore the water resource problems in the Middle East. This article stresses the need to manage jointly the shared water resources of the region which Gleick suggests as an unprecedented opportunity to move toward an era of cooperation and peace. Some historic information as well as general data about the various water resources in the Middle East are discussed.

Goldie, L.F. 1985. Equity and the International Management of Transboundary Resources. *Natural Resources Journal* 25 (3, July). Discusses how equitable principles of international law can provide guidelines and benchmarks for treaty makers and policy-makers. Addresses cooperative management in place of competitive management to create economic efficiency, and criteria for such measures.

Gradus, Y. 1994. The Israel-Jordan Rift Valley: A Border of Cooperation and Productive Coexistence. In *Political Boundaries and Coexistence: Proceedings of the IGU-Symposium, Basle/Switzerland, 24–27 May*, ed. Werner A. Galluser. New York, NY: Peter Lang. This article is a proposal for binational cooperation between Israel and Jordan in the areas of transportation, natural resource exploitation, water, agriculture, and tourism. The proposed water issue cooperation is joint management of the water table and the Dead Sea.

Grover, B. and M. Jefferson. 1995. A World Water Council: One Possible Model. *Water Resources Development* 11(2): 125–38. Discusses the World Energy Council as a possible model for a new Water Council. An annual budge of US$2 million is likely to be adequate. It is somewhat unlikely that any existing water-related international organization can be transformed successfully into a World Water Council. (abstract)

Guariso, Giorgio, Dale Whittington, Baligh Shindi Zikri, and Khalil Hosny Mancy. 1981. Nile Water for Sinai: Framework for Analysis. *Water Resources Research* 17 (6, December): 1585–93. The purpose of this article is to explore the concept of transporting Nile water to the Sinai. To complete this analysis, the authors formulate a multi-objective programming model in order to examine the trade-offs between the economic and political objectives and to study their interrelationships with such variables as water quantity, water quality, water transport costs, crop rotations, and irrigation technology. The analysis results provides evidence that shows that official plans largely ignore the sensitivity of the value of water in the rest of the country with regards to the reclamation efforts in the Sinai.

Handley, Paul. 1993. River of Promise. *Far Eastern Economic Review*, 16 September, 68–72. View of the economic efforts of Mekong basin countries to benefit trade and development along the river.

Hayes, Douglas L. 1991. The All-American Canal Lining Project: A Catalyst for Rational and Comprehensive Groundwater Management on the United States-Mexico Border. *Natural Resources Journal* 31 (Fall): 803–27. This article is a call for cooperation between the United States and Mexico to look at the current dispute over the All-American Canal Lining Project as an opportunity to mutually develop these groundwater resources instead of producing short-term results to the detriment of the sharing neighbour. Both the United States and Mexico claim rights to the groundwater currently leaking from the All-American Canal under the 1944 Colorado River Treaty.

Haynes, Kingsley and Dale Whittington. 1981. International Management of the Nile – Stage Three? Water Supply. *Geographical Review* 71 (1, January): 17–32. The purpose of this article is to show that a new management stage may soon be required to recognize the shift from concerns about water quantity to water quality consideration and from single large-scale project development to small-scale project planning. The authors suggest that

the new third stage of basinwide management will be an expansion of international riparian interests and increased operations complexity of the Nile.

Hayton, R.D. 1993. The Matter of Public Participation. *Natural Resources Journal* 33 (2, Spring): 275–81. Examines the current status of and recent progress in cooperative arrangements for the development of water resources shared by two or more countries. Such arrangements may range from the simple exchange of data to the design and implementation of major projects and formal resolutions of disputes. Topics which are of growing concern to river-basin organizations include integrated development and management of shared water resources and dealing with the freshwater-maritime interface. The article indicates that optimum coordinated development, use and protection of shared water resources is still a distant goal, and that increased institutionalization of cooperation is required. (abstract)

—— and A.E. Utton. 1989. Transboundary Groundwaters: The Bellagio Draft Treaty. *Natural Resources Journal* 29 (Summer): 663–722. This article presents the Bellagio Draft Treaty, a draft international groundwater treaty developed by a group of multidisciplinary specialists over an eight-year period. Added commentary by the authors provides greater understanding to the 20 articles found in the treaty. The purpose of the Bellagio Draft Treaty was to provide a system for the mutually agreed management of international aquifers in critical areas.

Hennessy, J. and N. Widgery. 1995. River Basin Development – the Holistic Approach. *International Water Power and Dam Construction* 47(5): 24–26. The holistic approach to water management advocated by the International Committee on Irrigation and Drainage (ICID) is discussed. Appropriate water management is defined as the use of the right solution to meet development needs in a particular environment sustainably. Underpinning principles are outlined. Institutional changes and a radical reappraisal of management practices will be required. Some initiatives and examples are presented. These include the Lesotho Highlands water project in South Africa; multi-purpose resource development of the Komati river basin in Swaziland; and the project to heighten the Roseires Dam in Sudan. (J.M. McLaughlin)

Heraclides, Alexis. 1989. Conflict Resolution, Ethnonationalism and the Middle East Impasse. *Journal of Peace Research* 26(2): 197–212. From the perspective of ''ethnic'' conflict resolution, the author categorizes (14 separate categories) state-ethnonationalist conflicts. Identifies 10 problems whose resolution is necessary for forward movement of the peace process.

Hill, Barbara J. 1982. An Analysis of Conflict Resolution Techniques: From Problem-Solving Workshops to Theory. *Journal of Conflict Resolution* 26 (1, March): 109–38. Discusses problem-solving workshops as developed by Burton, Doob, and Kelman, and suggests how such theories might be implemented.

Hipel, K.W. and Niall M. Fraser. 1980. Metagame Analysis of Garrison Conflict. *Water Resources Research* 16(4): 629–37. Metagame analysis is a type of game theory which can be employed for assessing the political feasibility of large-scale water-resources projects. The Garrison Diversion Unit, a planned irrigation scheme in North Dakota has caused a complex international controversy, which is analysed by using metagame analysis. Based upon the options available to the participants in the conflict and also the preferences of the participants, metagame analysis is used to predict possible feasible political solutions to the Garrison conflict. In addition, metagame analysis provides a framework for systematically studying the Garrison dispute so that the political complexities of the problem can be understood and put into proper perspective. (abstract)

—— R.K. Ragade, and T.E. Unny. 1976. Metagame Theory and Its Applications to Water Resources. *Water Resources Research* 12 (3, June): 331–39. The authors use metagame theory to examine water resource conflicts because it is a positive descriptive approach for

political resolution. This article illustrates that resource problems that are formulated using classical game theory, based on the theory of rationality, do not work. The results show that the conflicts examined in this article portray the potential of metagame theory for analysing water-resource management problems.

Hof, Frederick. 1995. The Yarmouk and Jordan Rivers in the Israel-Jordan Peace Treaty. *Middle East Policy* 3 (4, April): 47–56. Following a short history of Israel-Jordan water politics and conflict, Hof discusses key elements of the 1994 peace treaty. Syria and the Palestinian Entity are given a brief treatment as well.

Hofius, K. 1991. Co-operation in Hydrology of the Danube Basin Countries. In *Hydrology for the Water Management of Large River Basins*, ed. F.H.M. Van de Ven et al., 37–43. International Association of Hydrological Sciences. Since 1965 the Danube basin countries, ie the FRG, Austria, Czechoslovakia, Hungary, Yugoslavia, Rumania, Bulgaria, and the Soviet Union, have been cooperating under the International Hydrological Decade and the International Hydrological Programme. The type and the results of that cooperation are discussed. The first part of the paper deals with the organization of the cooperation, which at the beginning was difficult because of the different social systems of the Danube Basin countries. The cooperation under the International Hydrological Programme includes joint conferences at two-year intervals on hydrological forecasts and the preparation of a monograph on the hydrology of the Danube basin. After the completion and publication of the monograph, the Danube countries now continue work on four specific projects. In the second part of the paper the hydrological characteristics of the flow regime of the Danube are presented. The author of the paper is at present the co-presenter, and is at present coordinator of the Danube countries for the follow-up programme to the monograph. The paper is submitted by order of the Danube basin countries. (abstract)

—— 1991. Cooperation in Hydrology of the Rhine Basin Countries. In *Hydrology for the Water Management of Large River Basins*, ed. F.H.M. Van de Ven et al., 25–35. International Association of Hydrological Sciences. Since 1970 the Rhine basin countries, ie Austria, Switzerland, FRG, France, Luxembourg and the Netherlands, are cooperating under the International Hydrological Decade and the International Hydrological Programme. The type and the results of that cooperation are discussed. The first part of the paper deals with the administrative possibilities of implementing the cooperation of several states bordering a large river basin. It is important that the programmes to be set up are not too comprehensive so that they lead to results within a reasonable time. Particular problems arise in integrating the results at the borders. Isolines, for instance, do not agree with one another etc. Through the cooperation of the Rhine basin countries experience has been gained, which may be of use for other states in their cooperation for large river basins. The results of the work achieved so far by the International Commission for the Hydrology of the Rhine Basin established in 1970 are presented. In the second part of the paper the most striking hydrological characteristics of the flow regime of the Rhine are presented. (abstract)

Hori, Hiroshi. 1993. Development of the Mekong river basin, Its Problems and Future Prospects. *Water International* 18: 110–15. This paper describes the necessity, history, and problems of the development and the status of the entire Mekong river basin, and describes prerequisites for sustainable development.

Hosh, Leonardo and Jad Isaac. 1992. Roots of the Water Conflict in the Middle East. In *The Middle East Water Crisis*. The Middle East Water Crisis. University of Waterloo, 7–9 May. Discusses political boundaries and water sources, paths, and springs. ''Today's boundaries in the Middle East are, primarily, artificial frontiers imposed within the past 75 years by distant foreign powers.'' The authors then examine previous proposals for Middle East peace, identifying mistakes and defining portions of a new plan.

Howell, P.P. and J.A. Allan. 1994. *The Nile: Sharing a Scarce Resource. An Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge, MA: Cambridge University Press. Following recent climatic fluctuations, and consequent fluctuations in river flow in the Nile basin, forecasts of water availability will have to be greatly revised and new management strategies formulated to adapt to the new conditions. This book contains 19 papers presented at a conference held to address these issues. Papers are divided by theme into four sections. Section I contains five papers outlining the environmental history of the Nile and its past management. Section II contains two papers addressing the environmental data needs for predicting environmental change and devising future management strategies. The third section contains six papers proposing future strategies for managing water supply in the Nile basin. Individual papers discuss strategies for Egypt, Sudan, and Uganda. The final section contains six papers addressing international agreements, legal issues, and economic considerations for the effective management of the Nile Basin. (N. Davey)

Huddle, Franklin P. 1972. *The Mekong Project: Opportunities and Problems of Regionalism*. Report to House Committee on Foreign Affairs. Washington, DC: US Government Printing Office. Explores the concept of regionalism as a technique for systematically applying science and technology to bring Southeast Asia out of its series of conflicts. Gives detailed history of Mekong development.

Hulme, Mike and Mick Kelly. 1993. Exploring the Links Between Desertification and Climate Change. *Environment* 35 (6, July/August): 4–11. The African Sahel and many of the people it has tenuously supported are retreating southward, giving way to the inhospitable Sahara Desert. Why is the Sahara spreading? Is unsustainable land use or climate change to blame? And, if climate change is a factor, how much of that change is natural and how much results from all the greenhouse gases people have pumped into the atmosphere? Before an effective attempt can be made to stop desertification, its causes – and particularly any self-reinforcing cycles – must be understood. (abstract)

Ingram, H., and D.R. White. 1993. International Boundary and Water Commission: An Institutional Mismatch for Resolving Transboundary Water Problems. *Natural Resources Journal* 33 (Winter): 153–200. The purpose of this article is to analyse the performance of the International Boundary and Water Commission (IBWC) on the basis of its established record in resolving water problems. The authors recognize the usefulness of the IBWC model for other nations that share boundaries. However, criticisms of the IBWC are also explored through a review of scholarly and professional evaluations of the IBWC, particularly related to the Commission's United States section's ability to respond to state and local problems.

Islam, N. 1992. Indo-Bangladesh Common Rivers: The Impact on Bangladesh. *Contemporary South Asia* 1(2): 203–25. This article deals with the environmental and legal issues arising from Indo-Bangladesh common rivers, the diplomatic problems over water usage and the impact on Bangladesh's economy and society and indeed its security in the long term. It finds that the problem of sharing the water of the common rivers has soured the relationship between India and Bangladesh. The competing claims for land where meandering rivers have altered land structure have already taken the form of armed skirmishes between the security forces of the two countries. Failure to tackle the problem could have a disastrous impact on the environment. The multinational character of the river system necessitates multinational cooperation, aiming at securing bilateral and regional cooperation and security. (abstract)

Jacobs, Jeffrey W. 1994. Toward Sustainability in the Lower Mekong River Basin Development. *Water International* 19: 43–51. Discusses deforestation, water development projects, and the Mekong Committee.

Jamail, M.H. and Stephen Mumme. 1982. The International Boundary and Water Commis-

sion as a Conflict Management Agency in the US-Mexico Borderlands. *The Social Science Journal* 19(1): 45–60. The analysis completed in this article is a concentration on the development of the International Boundary and Water Commission (IBWC) since the signing of the US-Mexican Water Treaty in 1944. New problems facing the IBWC and the growing political dominance in US-Mexican relations are examined.

Jordan, Jeffrey L. 1992. *Resolving Intergovernmental Water Disputes Through Negotiation*. Athens, GA: University of Georgia. Examines the conflict between a city and county government in the southern United States. An 11-step process was used to solve the dispute under consideration.

Jovanovic, D. 1985. Ethiopian Interests in the Division of the Nile River Waters. *Water International* 10(2): 82–85. Jovanovic points out the flaws in the current Nile water allocations. Then he offers some possible solutions to future division of the waters. One must consider rain-fed agriculture, population, and maximum return per hectare of irrigated land. He also addresses non-water natural resources within a country that could support the economy.

Judge, Shana. 1994. The Nile: River of Hope or Conflict? *Transboundary Resources Report* 8 (2, Summer): 1–3. This report is a brief look into the current legal regime governing the Nile river. It is also a call for cooperation among all riparian states to form a comprehensive legal regime.

Just, Richard E., John K. Horowitz, and Sinaia Netanyahu. 1994. Problems and Prospects in the Political Economy of Trans-Boundary Water Issues. University of Maryland, College Park, MD, September. The main focus of this paper is the development and applied framework used to evaluate the potential for transboundary cooperation for water-resource sharing. The authors identify two distinct stages in water allocation decisions, the design and payment for large-scale projects such as reservoirs and dams, and the problem of who is allocated the use of the water must be solved. The case study used in this article is the relationship between Israel and its neighbours.

Kahhaleh, Subhi. 1981. *The Water Problem in Israel and its Repercussion on the Arab-Israeli Conflict*. Beirut: Institute for Palestine Studies. History and political analysis of Jordan river issues. Contains good figures and numerical references to dams and rivers in the area.

Kally, Elisha. 1989. The Potential for Cooperation in Water Projects in the Middle East at Peace. In *Economic Cooperation in the Middle East*, ed. Gideon Fishelson, 303–25. Boulder, CO: Westview Press. This article suggests that every project is independently feasible, but technical, economic, and political conditions as well as other projects being done in this framework will determine whether a project is implemented. The projects used in this study are the conveyance of Nile water eastward to the Gaza Strip, and a joint Jordanian-Israeli project for utilizing the Yarmouk river. Kally suggests that it is possible to envisage different combinations of various projects, and only the concrete shape of the peace will determine the ''basket'' of projects that could be undertaken.

Karsh, Efraim. 1991. Neutralization: The Key to an Arab-Israeli Peace. *Bulletin of Peace Proposals* 22(1): 11–24. Discusses a strategy for neutralizing the entire Arab-Israeli ''sector.'' Provides US and Russian views of neutrality. The author realizes that the scheme is almost unbelievable.

Kassem, Atef M. 1992. The Water Use Analysis Model (WUAM): A River Basin Planning Model. In *Proceedings of the International Conference on Protection and Development of the Nile and Other Major Rivers,* Vol. 2/2. International Conference on Protection and Development of the Nile and Other Major Rivers. Cairo, Egypt, 3–5, February. This article presents the Water Use Analysis Model (WUAM) which unlike most river basin planning models built around the concept of ''supply management,'' was developed by placing a special emphasis on water demand modelling and incorporating the key vari-

ables affecting water use, which are missing in the other planning models. The paper explores all aspects of WUAM and its potential for other water applications.

Kattelmann, Richard. 1990. Conflicts and Cooperation over Floods in the Himalaya-Ganges Region. *Water International* 15(4): 189–94. Flood damage near the Ganges has increased due to population pressures. Unsupported scientific theories are fuelling a conflict unnecessarily. Some engineering approaches have merit, but the more effective strategies are flood forecasting and warning.

Kaye, Lincoln. 1989. Resources and Rights: Rivalries Hamper Indo-Bangladesh Water Sharing. *Far Eastern Economic Review* 2 (February): 19–22. Discusses floodwaters in Bangladesh and the 1970 talks between India and Bangladesh, including some discussion of the water-sharing agreements.

—— 1989. The Wasted Waters. *Far Eastern Economic Review* 2 (February): 16–18. Kaye discusses India and the water needs of that country. He offers advice based on India's behaviour in the past when negotiating with riparian neighbours, including issues of economics of scale, information sharing, and multilateral negotiations.

Kelman, Herbert C. 1982. Creating the Conditions for Israeli-Palestinian Negotiations. *Journal of Conflict Resolution* 26 (1, March): 39–75. Kelman addresses necessary conditions for a win-win settlement of Israeli-Palestinian issues, working to overcome zero-sum ideas.

Kershner, Isabel. 1990. Talking Water: Secret U.S.-mediated Negotiations Could Herald Regional Cooperation in the Middle East. *The Jerusalem Report*, 25 October, 44–45. Kershner downplays the idea that the next Middle East war will arise out of a water dispute. She reports on behind-the-scenes mediation by the United States and water issues on the Yarmouk river.

Khan, M. Yunus. 1990. Boundary Water Conflict Between India and Pakistan. *Water International* 15 (4, December): 195–99. Details the agreements between India and Pakistan over the Indus system. Water was first apportioned with ''preferential right to existing uses.'' Also includes information on the Permanent Indus Commission.

Khan, Tauhidul Anwar. 1994. Challenges Facing the Management and Sharing of the Ganges. *Transboundary Resources Report* 8 (1, Spring): 1–4. Problems of managing and sharing the Ganges. Includes negotiation history 1975–1992 and discussion of several proposed projects.

Khan, Z.A. 1976. *Basic Documents on Farakka Conspiracy From 1951 to 1976*. Dacca: Khoshroz Kitab Mahal. This book primarily uses newspaper references. It highlights the economic and transportation stresses that the Farakka diversion would place upon Bangladesh.

Kirmani, S. 1990. Water, Peace and Conflict Management: The Experience of the Indus and Mekong River Basins. *Water International* 15 (December): 200–05. Includes some history of the Indus and Mekong river problems. Proposes three points for negotiation strategy: understanding that without negotiations, one or more nations will be harmed; third-party negotiation; and financial support for management of the problem.

—— and R. Rangeley. 1994. *International Inland Waters: Concepts for a More Active World Bank Role*. Technical Paper, Vol. 239. Washington, DC: World Bank. This article is a review of the World Bank's role in international water affairs. The purpose of this report is to address concerns expressed by the delegates of an international workshop on comprehensive water resources management organized by the Bank in June 1991. The paper recommends that the Bank should play a more proactive role in international water affairs, its policy should be flexible, and its immediate focus should be to assist riparian countries in their efforts to establish cooperative arrangements.

Kishel, J. 1993. Lining the All-American Canal: Legal Problems and Physical Solutions. *Natural Resources Journal* 33 (Summer): 697–726. The purpose of this article is to explore

the potential solutions to a developing transboundary conflict between the groundwater laws of the United States and Mexico. Kishel suggests that the conflict can be solved with physical and institutional solutions, which are developed outside of conventional transboundary dispute resolution mechanisms.

Kliot, Nurit. 1995. Building a Legal Regime for the Jordan-Yarmouk River System – Lessons from Other International Rivers. *Transboundary Resources Report* 9(1): 1–3. The purpose of this paper is to present possible regimes for the Jordan-Yarmouk river based on international regimes. These regimes are established by exploring treaties and agreements in other international rivers with particular attention to those rivers where there is conflict and in which the regime or institutional arrangement deal with consumptive water.

—— and Yoel Mansfeld. 1994. The Dual Landscape of a Partitioned City: Nicosia. In *Political Boundaries and Coexistence: Proceedings of the IGU-Symposium, Basle/Switzerland, 24–27 May*, ed. Werner A. Galluser, 151–61. New York, NY: Peter Lang. The 1974 Turkish invasion and occupation of North Cyprus imposed a new border on Cyprus and divided the small island into two entitites separated by a demilitarized zone and by the UN peacekeeping forces. The ''Green Line'' is a defacto border with very restricted cross-border transactions as the government of Cyprus acknowledges the northern territory as an occupied area and not as the (self-proclaimed) Turkish Republic of North Cyprus. Cooperation between the two partitioned parts is limited to sharing water. (abstract)

Kolb, Deborah M. and Susan S. Silbey. 1990. Enhancing the Capacity of Organizations to Deal with Disputes. *Negotiation Journal* 6 (4, October): 297–304. Deals with conflict within existing businesses or other such organizations. They address prevention, the capacity to handle disputes and barriers to a larger such capacity. The authors affirm that conflicts are inevitable and one key to resolving them amicably is to make sure that all involved feel their needs will be addressed.

Kowalok, Michael E. 1993. Common Threads: Research Lessons from Acid Rain, Ozone Depletion, and Global Warming. *Environment* 35 (6, July/August): 12–20. Research on environmental hazards is often haphazard: studies from different disciplines suddenly fit together in an unexpected way; scientists geographically far apart come to similar conclusions; and what initially appears to be a minor effect turns out to be critical. This brief account of the research leading to the discovery of three major environmental threats demonstrates that successful environmental research, despite its unpredictability, has several important characteristics. (abstract)

Kremenyuk, Victor, ed. 1991. *International Negotiation: Analysis, Approaches, Issues*. San Francisco: Jossey-Bass. This book intentionally concentrates on aspects of negotiation with least relation to political considerations. It traces the role of applied systems analysis, history of conflict negotiation at the International Institute for Applied Systems Analysis, and several approaches to international negotiation.

Kriesberg, Louis. 1988. Strategies of Negotiating Agreements: Arab-Israeli and American-Soviet Cases. *Negotiation Journal* (January): 19. The author compares situations of international conflict that do and that do not result in de-escalation of the problem, from the 1947 Austrian State US-Soviet talks to the 1986 PLO-Hussein-Peres talks.

Kuffner, Ulrich. 1993. Water Transfer and Distribution Schemes. *Water International* 18 (1, March): 30–34. Wherever water is needed, solutions have been sought to bring it to cities, industries, and dry fertile lands. Large water transfer schemes have a long history dating back thousands of years. In modern times, water transfer projects have been built in several countries, including Israel. They have found wide interest and have drawn attention to similar solutions for the Middle East. The gradual transformation of transfer schemes into large-scale distribution networks has found less attention. In Israel and, to a lesser extent in Jordan, extensive distribution systems bring water over large distances from various sources to the main consumption centres. The advantages of these networks in-

clude the possibility of balancing supply and demand over large distances, of pooling the financial resources of communities and regions, of sharing important structures such as reservoirs and treatment facilities, and providing greater security against local supply failures. It is suggested that consideration should be given to the expansion of large-scale distribution networks across national borders. The gradual acceptance of water as an economic good in the international community may facilitate the acceptance of such a solution. Reference is made to World Bank assistance to water projects in the Middle East and to World Bank support for international river basin development in the Indus basin and, more recently, in Southern Africa. (abstract)

Landau, George D. 1980. The Treaty for Amazonian Cooperation: A Bold New Instrument for Development. *Georgia Journal of International and Comparative Law* 10 (3, Fall): 463–489. All eight countries of the Amazon basin signed the TAC (Treaty for Amazonian Cooperation) on 3 July 1978. This article details the aspects of the treaty, a history of the negotiations, issues raised by the treaty, and the strategy for development that the treaty proposes.

Lee, Kai N. 1982. Defining Success in Environmental Dispute Resolution. *Resolve* (Spring): 1–3. The author seeks to find a measure or benchmark of success when using non-adjudicatory methods for environmental disputes.

Lee, T. 1992. Water Management Since the Adoption of the Mar del Plata Action Plan: Lessons for the 1990s. *Natural Resources Forum* (August): 202–11. In the 13 years since the United Nations Water Conference, the policies applied to the administration of water resources have undergone considerable modification in most countries. For most of this period no overall trend in the direction of change can be easily seen. Recently, however, with the general adoption of policies decentralizing water management responsibilities away from central governments, an opportunity has been presented for the general application of some of the basic management principles enunciated in the Mar del Plata Action Plan. This paper presents a review of current water administration policies and of water management problems in Africa, Asia, Latin America, and the Caribbean. (abstract)

LeMarquand, David. 1989. Developing River and Lake Basins for Sustained Economic Growth and Social Progress. *Natural Resources Forum* (May): 127–38. The purpose of this article is to provide a context for evaluating how best to advance well-conceived water-resources development in Africa. The author looks at: river basin development planning concepts and experiences as they have evolved; their application and aptness to developing countries, particularly in Africa; the role of foreign assistance with emphasis on multidonor financing; and the complications of developing water resources shared by two or more states. The conclusion suggests that concepts of multipurpose projects, river basin planning, river basin institutions and regional development provides a useful framework for planning the various water-related issues facing Africa.

Lesser, J.A. 1990. Resale of the Columbia River Treaty Downstream Power Benefits: One Road from Here to There. *Natural Resources Journal* 30 (Summer): 609–28. Joint Canada-United States development of the Columbia river system was made possible by the Columbia River Treaty. To finance the construction of the storage projects it would be required to build, Canada sold its share of the additional hydroelectric power benefits made possible by the treaty to the United States. That power will be completely repatriated to Canada by 2003. Unless a new sale is arranged, the Pacific Northwest may have to replace as much as 600 average megawatts of energy, and 1,400 megawatts of capacity. The issues associated with any potential resale, however, will be complex. This paper presents estimates of the value of the Canadian share of energy from the perspective of the Pacific Northwest, and discusses policy issues that eventually will have to be addressed by both countries. (abstract)

Libiszewski, Stephan. 1994. Sources of Life, Sources of Strife. *Swiss Review of World Affairs*

6: 8–10. Water is being wasted and polluted everywhere, while population growth strains the supply. International tensions over this vital resource are increasing so much that in a number of places where important rivers cross borders, war could break out. This article focuses on the Tigris-Euphrates basin, where ethnic hostilities and power politics among nations only amplify the conflicts over water. The author is a scholar working on an international research project called "The Environment and Conflict" at the Research Institute for Security Policy and Conflict Analysis at the Swiss Institute of Technology (ETH) in Zurich. (abstract)

Linnerooth, J. 1990. The Danube River Basin: Negotiating Settlements to Transboundary Environmental Issues. *Natural Resources Journal* 30: 629–58. This article explores the environmental degradation factors as major issues surrounding the Danube river. Detailed are both the scientific and institutional complexities involved in negotiating agreements among the Danube riparian nations. Forms of cooperative action are suggested as well as the potential role for an independent analyst in the negotiation process.

Linnerooth-Bayer, Joanne. 1993. Current Danube River Events and Issues. *Transboundary Resources Report* (Winter): 7. A brief discussion of the Gabcikovo-Nagymaros hydroelectric project and the Rhine-Main-Danube canal.

Lonergan, Stephen C. and David B. Brooks. 1994. *Watershed: The Role of Fresh Water in the Israeli-Arab Conflict*. Ottawa: International Development and Research Centre. A detailed and comprehensive view of the Arab-Israeli water conflict. Of particular note is Chapter 8, "Water and Security in Israel."

Lord, W. 1980. Water Resource Planning: Conflict Management. *Water Spectrum* 12: 2–10. The purpose of this article is to explore whether there are institutional obstacles to effective conflict management within the planning process. There is a focus on the institutional aspects of water-resources decision-making. The author's conclusion is that there are aspects of existing institutions which militate against effective conflict management.

Lynne, Gary D., J. Walter Milon, and Michael E. Wilson. 1990. Identifying and Measuring Potential Conflict in Water Institutions. *Water Resources Bulletin* 26 (4, August): 669–76. Scarcity combined with differences in values, beliefs, and attitudes can lead to behaviour differences and conflicts over water. This paper develops an index for measuring potential conflict using survey information about water attitudes and beliefs of individuals in three groups in a Florida case study. The index helps in assessing the current capability of the institution to reduce conflict. The results suggest that the current institution is effective, but changes may help to streamline the consumptive-use permitting process, to improve educational programmes, and to seek improved institutional arrangements to reduce future conflict over economic uses of water. (abstract)

MacAvoy, Peter V. 1986. The Great Lakes Charter: Toward a Basinwide Strategy for Managing the Great Lakes. *Case Western Reserve Journal of International Law* 18(49): 49–65. A history of the Great Lakes Charter – an eight-state, two-province pact signed in February 1985. It outlines tenets of the charter and offers some next steps in basinwide strategy.

MacDonnell, L.J. 1988. Natural Resources Dispute Resolution: An Overview. *Natural Resources Journal* 28 (Winter): 5–19. This article is the introductory piece in an issue of *Natural Resources Journal* devoted to emerging alternative approaches to addressing natural resources-based disputes. Under consideration are the sources and types of conflict in natural resources, general approaches to dispute resolution, and choices in determining which approach to use. Included is a table of the distribution of environmental disputes.

Mageed, Y.A. and G.F. White. 1995. Critical Analysis of Existing Institutional Arrangements. *Water Resources Development* 11(2): 103–11. The need for improved institutional arrangements in water resources management has been recognized for many years; prior

to Mar del Plata, and most recently at Dublin and Rio. Consensus seems to be emerging that a new global organization should be created from representatives of local, national., regional, and international organizations embracing environmental, economic, and political concerns. It would promote exchange of information and experience to define issues and methods deserving of attention, and would critically appraise previous actions in selected sectors and areas of water management. It should not duplicate existing organizations. (abstract)

Mahendrarajah, S. and P.G. Warr. 1991. Water Management and Technological Change: Village Dams in Sri Lanka. *Journal of Agricultural Economics* 42(3): 309–24. This paper studies the intertemporal allocation of monsoonal water storage in village dam-based irrigation systems in the dry zone of Sri Lanka. The tradiational water management practices observed in these villages are based on common property access and serve to minimize social conflict over water rights. They are also acceptably efficient in economic terms, given the water demands of the traditional rice production technology. Adoption of high-yielding variety (HYV) rice technology produces a dramatic increase in rice output, but the traditional water-management practices then become less efficient. The paper demonstrates a method for determining the nature of an efficient water-management system and for estimating the economic magnitude of the inefficiency arising from the traditional practices. In the case study, efficient water management increases the gains available from HYV adoption by a further one-fourth. (abstract)

Maluwa, T. 1988. Legal Aspects of the Niger River Under the Niamey Treaties. *Natural Resources Journal* 28 (Fall): 671–97. The primary conclusion of this study is that the West African conventions, the Niamey Treaties, should be regarded as constituting an undeniable contribution to the development of international fluvial law in general. As such, concepts embodied in these treaties have been found to be expresses in preliminary drafts being considered by the International Law Commission in a codification programme. This article contains primarily legal terminology.

Marr, P. and W. Lewis, eds. 1993. *Riding the Tiger: The Middle East Challenge After the Cold War*. Boulder, CO: Westview Press. A collection of essays dealing with negotiation and policy issues in the aftermath of the USSR's collapse. Includes analysis of military, resource, ethnic, and religious issues, by various authors.

Mateo, R.M. 1992. Administration of Water Resources: Institutional Aspects and Management Modalities. *Natural Resources Forum* (May): 117–25. While water has always been important to people, recent pressures of population, ecology, geography, and economic development have created new demands for water and call into question the old institutional arrangements for the administration of water resources. Drawing upon experience, largely from Spain and Latin America but including some examples from Europe, this paper examines the role that private enterprise and water cooperatives could play in promoting more efficient water use. The paper concludes that private management techniques under public control may prove useful but are no panaceas. (abstract)

Mather, T. 1989. The Planning and Management of African River and Lake Basin Development and Conservation. *Natural Resources Forum* (February): 59–70. The purpose of this article is to identify the constraints which impede development of African river basin resources. The author suggests these identifications should be included to aid the predicted outcomes of planned proposals for the ultimate successes of these plans. The identification of these constraints include physical and climatic reasons, socio-cultural characteristics and priorities of national economies.

Matsuura, Shigenori. 1995. China's Air Pollution and Japan's Response to It. *International Environmental Affairs* 7 (3, Summer): 235–48. Long-range transport of air pollutants has been a serious global environmental problem. Japan's Central Research Institute of Electric Power Industry (CRIEPI) researchers are investigating the possibility of acid rain

from China. So far, the acid rain that has appeared in Japan has not had a significant effect. However, because of the high economic growth projected for the coming years in China, acidic fallout from that country is likely to cause serious damage there and in Japan as well. China is one of the largest coal users in the world. One of the biggest factors making air quality worse is the lack of appropriate technologies. Although Japanese desulphurization technologies are well advanced, they cannot be directly applied to stationary pollution sources in China, because of their costs. Japan has sophisticated technologies, but lacks experience in and knowledge of alternative, intermediate, and low-technology solutions. Given this, Japan may attempt to buy pollution control technology equipment from the United States, which provides a wider range of desulphurization technologies, as a part of the Official Development Assistance programme. At the same time, international support that includes the establishment of additional global environmental monitoring states in China are also necessary. (abstract)

McKinney, Matthew. 1992. Designing a Dispute Resolution System for Water Policy and Management. *Negotiation Journal* 8 (2, April): 153–64. Examines the case of Montana's Department of Natural Resources and Conservation and its attempt to implement a state water-planning process. Includes history 1988–1992, an evaluation of the process, and more general guidelines for dispute resolution systems.

Megahan, Walter F. and Peter N. King. 1985. Identification of Critical Areas on Forest Lands for Control of Nonpoint Sources of Pollution. *Environmental Management* 9 (1, January): 7–18. Most non-point source pollution problems on forest lands can be controlled by careful planning and management of specific critical areas. Critical areas include sites with high mass and surface erosion hazards, overland flow areas, and the riparian zone. Some guides for identifying critical areas are presented along with examples of land-use constraints that might be applied. (abstract)

Meier, Richard L. 1991. *A Global Role for the Palestine Arabs: The Integrated Agro-Industrial Complex*. University of California, Berkeley, April. Discusses the Oak Ridge Nuclear labs attempt to provide a solution to the Palestinian problem with desalination plants and fertilizer. Then the author moves on to discuss some of his work that followed the Oak Ridge proposal.

Miller, Morris. 1995. Transformation of a River Basin – Case of the Mekong Committee. Asian Water Forum. Bangkok, Thailand: United Nations University, 30 January–1 February. Answers the questions "Why examine the functions of the Mekong Committee?" and "What should and could be done to enable the MC to more effectively promote the development of the Mekong region?"

Moore, J. 1992. *Water-Sharing Regimes in Israel and the Occupied Territories*. Ottawa: Department of National Defence, Canada. This study outlines an approach for equitably apportioning the transboundary groundwaters shared between Israel and the Palestinians of the occupied territories.

Mumme, Stephen. 1993. Innovation and Reform in Transboundary Resource Management: A Critical Look at the International Boundary and Water Commission, United States and Mexico. *Natural Resources Journal* 33 (Winter): 93–132. The purpose of this study is to examine the reform needed of the International Boundary and Water Commission (US-Mexico) in this time of numerous changes along the border, demographic, political, and attitudinal. These changes are impacting the Commission's ability to manage transboundary resource problems of the region. The author indicates that there are limitations on the Commission detailed in the treaty mandate, however, there are several areas where development and improvements can be made, including, sanitation and water quality, instream flow, and creative approaches to project financing.

Murakami, M. and A.T. Wolf. 1995. Techno-political Water and Energy Development Alternatives in the Dead Sea and Aqaba Regions. *Water Resources Development* 11(2): 163–

83. Water and energy will be key elements in any regional development schemes in arid regions, being the limiting factors for planned tourism/resorts, industry, and commerce. Two regions may be particularly attractive for regional economic development planning: the Dead Sea region, including the territory of Israel, Palestine, and Jordan; and the Aqaba/Eilat area, which includes Egypt, Israel, Jordan, and Saudi Arabia. These two regions could act as showcases of cooperation between the countries of the Middle East. This study describes both technical and political priorities for water and energy development projects, including non-conventional alternatives, particularly proposed hydro-solar and seawater pumped-storage schemes with hydropowered reverse osmosis (RO). Technical and political implications of these projects are examined in a framework of interstate regional economic cooperation. (abstract)

Murphy, I.L. and J.E. Sabadell. 1986. International River Basins: A Policy Model for Conflict Resolution. *Resources Policy* 12 (June): 133–44. The need to facilitate agreements between countries in dispute over the management and use of a shared river basin increases as water needs and new pollution issues emerge. Develops a policy model to track the decisions made within countries to resolve international differences. The decision process is better understood and its outcome more predictable when data about the joint goals and decisions of governments are matched with the components of the policy model. Three case studies are summarized and conclusions with respect to the impact of political processes on the resolution of international river basin conflicts are presented. (abstract)

Murray, John S. 1990. Dispute Systems: Design, Power, and Prevention. *Negotiation Journal* 6 (2, April): 105–09. Report on a conference of the Society of Professionals in Dispute Resolution. Accents the dispute resolution system designer's responsibility and the role of prevention.

Naff, Thomas and Ruth C. Matson. 1984. *Water in the Middle East: Conflict or Cooperation?* Boulder, CO: Westview Press. A comprehensive work that addresses water issues along the Jordan, Litani, Euphrates, Orontes, and Nile rivers. Legal aspects and the potential for cooperation are also discussed. Each river chapter details hydrology, technical aspects, history, conclusions, and additional references.

Nazem, Nurul Islam and Mohammad Humayun Kabir. 1986. *Indo-Bangladesh Common Rivers and Water Diplomacy*. Dacca: The Bangladesh Institute of International and Strategic Studies. Discusses such topics as Farakka, Indo-Bangladesh relations since 1971 (when Bangladesh became independent), augmentation of dry-season flows, smaller rivers, and perceived policy options for both states.

Newson, M. 1992. Water and Sustainable Development: the "Turn Around Decade?". *Journal of Environmental Planning and Management* 35(2): 175–83. The paper comments on the development of an international movement towards both sustainability and subsidiarity in the management of large river basins, and also stresses the significance of river basins for their sense of place and symbolism as environmental territory. Two contrasting efforts are compared, in the developed world (European Community) through the Freshwater Europe Campaign, and in the developing world through the lead-in to the Earth Summit. Finally, suggestions are made that the best manifesto for the problem of water and development is an ecosystems approach to the river basin, modified by a greater use of approaches from social science and objectives of social justice. (abstract)

Nickum, J.E. and K.W. Easter. 1990. Institutional Arrangements for Managing Water Conflicts in Lake Basins. *Natural Resources Forum* 14 (3, August): 210–21. Water conflicts may arise from market failures caused by (i) poor specification or transferability of water rights; (ii) incentive problems such as rent seeking, open access or free riding; or (iii) transaction costs. They may also occur because of failures in non-market alternatives such as government management. Recent recognition of non-market failures has led to greater consideration of market-based approaches to conflict resolution such as tradeable permits

or bargaining. It has also enriched our understanding of government-based approaches. All approaches would appear to benefit from greater attention to promoting collective action by the users of water. For illustration we refer to the problems of lake basins, using several specific examples from Asia. (abstract)

Nishat, Aminun. 1995. Impact of Ganges Water Dispute on Bangladesh. Asian Water Forum. United Nations University, 30 January-1 February. Offers a brief history of Ganges negotiations and adverse effects of the Farakka's reduction of the Ganges flow, including economic detriment due to Ganges diversions.

Nomas, H.B. 1988. The Water Resources of Iraq: An Assessment. diss, 486 pp. University of Durham. The Euphrates and Tigris are international rivers with renewable but finite resources, shared by four riparian states, Turkey, Syria, Iraq, and Iran. At present, only Iraq is a major water user and, due to the dominant arid to semi-arid climate, relies almost entirely upon this drainage system. In recent decades, the upstream riparian states have planned for large-scale irrigation and hydroelectric power developments. These will certainly affect water availability and quality in the lower riparian state, Iraq, if they are fully implemented as planned. Thus, the objective of this study is to emphasize the Euphrates and Tigris as an integrated crucial shared resource and to determine the whole aspect of the present and prospective water development situations. The main solution to the problem is achieving a mutual international agreement to secure the appropriate share for each state in terms of water quality and quantity. It is hoped that the riparian states will promote these cooperative efforts to achieve lasting agreements in order to avoid potential conflict. (abstract)

North, Ronald M. 1993. Application of Multiple Objective Models to Water Resources Planning and Management. *Natural Resources Forum*, August, 216–27. This paper provides a self admitted brief and incomplete example of a macroeconomic-based, multiple objective, water-resource planning and management model. The authors approach is to use generally accepted principles of strategic planning and management. In addition, there is a recommended goal programming algorithm which is capable of integrating the combinations of structural and management solutions. This is achieved by a comparison of results in terms of incommensurate values for economic, environmental, and social indicators.

Okada, Norio, Keith W. Hipel, and Yoshiharu Oka. 1985. Hypergame Analysis of the Lake Biwa Conflict. *Water Resources Research* 21 (7, July): 917–26. Hypergame modelling of conflicts and predicting the compromise solutions. The authors expect that their conflict analysis can be used in any conflict, and have had success with predicting the actual outcomes of historical conflicts.

Okidi, C.O. 1988. The State and the Management of International Drainage Basins in Africa. *Natural Resources Journal* 28 (Fall): 645–69. The purpose of this paper is to examine some of the macro-policy questions of state involvement in actual management and utilization of the waters of any basin in Africa. The author suggests that whether the management and utilization of the water is done within a national or regional framework, the role of the state will evince common conditions which are similar when looked at from the perspective of promotion of the socio-economic well-being of the human population.

Ozawa, Connie P. and Lawrence Susskind. 1985. Mediating Science-Intensive Policy Disputes. *Journal of Policy Analysis and Management* 5(1): 23–39. Proposes means to not let scientific issues mask underlying distributional issues.

O'Connor, David. 1992. The Design of Self-Supporting Dispute Resolution Programs. *Negotiation Journal* 8 (2, April): 85–91. A report on the experience of the State of Massachusetts' Office of Dispute Resolution. It relates history of the following topics: generating business, programme goals, design considerations, the referral of disputes (from other agencies), dispute acceptance screening procedures, selection and performance of the dispute resolvers, and the quality with which these duties were performed.

Paul, T.V. 1994. *Asymmetric Conflicts: War Initiation by Weaker Powers*. Cambridge, MA: Cambridge University Press. This book examines the question of why militarily and economically weaker states initiate war on stronger ones? The author questions the idea that a stronger power (with a suitable retaliatory capability) can maintain peace by remaining stronger. Case studies include Japan-Russia (1904), Japan-US (1941), Chinese-UN (Korea, 1950), Pakistan-India (1965), Egypt-Israel (1973), and Argentina-UK (1982).

Paulsen, C.M. 1993. Policies for Water Quality Management in Central and Eastern Europe. In *Two Essays on Water Quality in Central and Eastern Europe. ENR93-20*, 15–25. Washington, DC: Resources for the Future. Charles M. Paulsen, of Resources for the Future, examines the design of source-control policies for point sources of water pollution in Central and Eastern Europe (CEE) with an emphasis on policies that will meet ambient water quality targets cost-effectively. Paulsen argues that cost-effective policies are difficult to implement, and that the direction of water pollution control policy is made unclear by economic restructuring in CEE. Nevertheless, the cost savings from more efficient policies can be large, so much policy warrants serious consideration. (abstract)

Perritt, R. 1989. African River Basin Development: Achievements, the Role of Institutions, and Strategies for the Future. *Natural Resources Forum*, August, 204–08. This article provides a summary of the presentations and themes of the international conference on the African Experience with River Basin Development. Included is a list produced by the conference of general priorities for improving river basin development in Africa. The purpose of the conference was to learn from the past, suggest appropriate corrective measures, and broaden the horizons for river basin development in the form of proposals envisioning a more comprehensive framework for institutional involvement.

Platter, Adele G. and Thomas F. Mayer. 1989. A Unified Analysis of International Conflict and Cooperation. *Journal of Peace Research* 26(4): 367–83. Mathematical modelling of structural components international relations. Addresses proximity, history, tendency to initiate conflict or negotiations.

Precoda, Norman. 1991. Requiem for the Aral Sea. *Ambio* 20 (3–4, May): 109–14. Heavy withdrawals of irrigation water from the Syr and Amu, the Aral sea's two main tributaries, have for all practical purposes eliminated their spills and led to a sharp decrease in the level of the sea. This and the disruption of ecological equilibrium in this immense region have had catastrophic consequences for both the inhabitants of the region and for the environment. The circumstances leading up to and important features of some of the principal consequences are described. (abstract)

Priest, J.E. 1992. International Competition for Water and Motivations for Dispute Resolution. *Agricultural Water Management* 21(1–2): 3–11. Disputes regarding water allocation among nations have affected and distorted water use and development across the South Asian subcontinent, Middle East, and Africa ever since decolonization following World War II. Issues, posturing, developments, and attempts at dispute resolution are reviewed for six great rivers. Demographics, physical developments, the political environment, and motivations that influence the process of dispute resolution are identified. (abstract)

Quigg, Phillip W. 1977. A Water Agenda to the Year 2000. *Common Ground* 3(4): 11–16. The author, arguing that water should be regarded as a vulnerable and finite resource, along the same lines as food and energy, presents a comprehensive summary of current water problems and issues. He considers the development of water resources, the goal of pure drinking water for all, more efficient irrigation, recharge and water mining, industrial recycling, the protection of watersheds and wetlands and the problems of arid lands. Then, under the heading of waste water and treatment he looks at discharge standards, urban and agricultural runoff, toxic wastes, groundwater, disposal of sewage sludge and sanitation for the Third World. He concludes by reviewing the techniques and institutions in water law, water economics, water as a source of energy, water sharing and water disputes, water and the environment and water management. (M. Higgins)

Quinn, J.T. and J.J. Harrington. 1992. Generating Alternative Designs for Interjurisdictional Natural Resource Development Schemes in the Greater Ganges River Basin. *Papers in Regional Science* 71(4): 373–91. Planning for the development of regional water resources is often complicated by severe disputes. For example, in the Greater Ganges river basin, there are disagreements between India and Bangladesh over sharing the low river flows during the dry season and over controlling the potentially destructive large river flows during the monsoon. This paper illustrates an approach for providing the two riparian nations with distinct water resources plans to help solve their regional water conflicts. More specifically, a linear programming model representing a multipurpose river basin system is presented. The concept of near optimality is employed to generate a variety of solutions, in contrast to searching only for a global optimum. These solutions are grouped into similar project designs by applying a cluster analysis, which is a multivariate technique. Several project designs are graphically displayed, and their implications for national and international agreements are discussed. The range of regional alternatives available to India and Bangladesh could aid in their negotiations. (abstract)

Radosevich, G.E. 1995. The Mekong – A New Framework for Development and Management Under a Renewed Spirit of Cooperation. In *Asian Water Forum*. Asian Water Forum. Bangkok, Thailand: United Nations University, 30 January–1 February. Discusses legal and institutional aspects of the Mekong river development efforts. Focuses more on what has been accomplished rather than what needs to be done, but it does have a discussion of a new framework for cooperation.

Rangeley, Robert, Bocar M. Thiam, Randolph A. Andersen, and Colin A. Lyle. 1994. *International River Basin Organizations in Sub-Saharan Africa*. World Bank Technical Paper, Africa Technical Department Series, Vol. 250. Washington, DC: World Bank. This report has been prepared as a contribution to a concerted effort within the World Bank to define more explicitly its policies towards water-resources management. In particular, it aims to assist the World Bank and other international orgnaizations in their pursuit of a more active role in helping sub-Saharan African countries improve the management of shared water resources. At the same time, the report contains some generic findings that should be of direct value to decision-makers in riparian states involved in such issues. (abstract)

Raskin, P., E. Hansen, Z. Zhu, and D. Stavisky. 1992. Simulation of Water Supply and Demand in the Aral Sea Region. *Water International* 17(2): 55–67. The Aral sea, a huge saline lake located in the arid south-central region of the former USSR, is vanishing because the inflows from its two feed rivers, the Amudar'ya and Syrdar'ya, have diminished radically over the past three decades. The loss of river flow is the result of massive increases in river withdrawals, primarily for cotton irrigation in the basins. A microcomputer model, the Water Evaluation and Planning System (WEAP), has been developed for simularing current water balances and evaluating water management strategies in the Aral sea region. WEAP treats water demand and supply issues in a comprehensive and integrated fashion. The scenario approach allows flexible representation of the consequences of alternative development patterns and supply dynamics. For the Aral region's complex water systems, a detailed water demand and supply simulation was performed for the 1987–2020 period, assuming that the current practices continue. The analysis provides a picture of an unfolding and deepening crisis. Policy scenarios incorporating remedial actions will be reported in a separate paper. (abstract)

Redclift, M. 1991. The Multiple Dimensions of Sustainable Development. *Geography* 76, part 1(330): 36–42. The problem with referring to "sustainable development" is that its very appeal is its vagueness. Sustainable development means different things to different people: ecologists, environmental planners, economists, and activists. Part of the interest in the discussion of sustainable development lies in the way the concept has been bor-

rowed from both the natural and social sciences. This paper examines the contribution that a broadly-based concept of sustainable development can make: focusing attention on poor peoples' use of sustainability in seeking livelihoods from resources-poor areas of the South. (abstract)

Reguer, S. 1993. Controversial Waters: Exploitation of the Jordan River, 1950–80. *Middle Eastern Studies* 29(1): 53–90. This article examines the growing importance of Jordan water to both Israel and Jordan as the two countries planned for expanding agriculture, industry and population in the three decades following the end of the British mandate over Palestine. It will describe what happened when politics infringed on the realization of the development plans and how these two countries had to contend with political barriers in order to exploit the Jordan river. The primary sources for this study were provided mainly by the Jordan Valley Authority in Amman and Tahal in Tel Aviv. This study points out the great strides that can be made without international cooperation; however, there are limits to national river development. These limits have been reached in the Jordan-Yarmuk system. Competition for water usage has resumed, and if no solution is found, water scarcity is likely to be one of the reasons for sparking the next regional conflict. Water scarcity should now become an imperative for political cooperation. (abstract)

Rhodes, Thomas C. and Paul N. Wilson. 1995. Sky Islands, Squirrels, and Scopes: The Political Economy of an Environmental Conflict. *Land Economics* 71 (1, February): 106–21. Siting conflicts involving endangered species create economic and political pressures on existing property rules. A welfare model of institutional change with endogenous transaction costs is used to analytically describe the environmental conflict surrounding the Mount Graham International Observatory project. Emphasis is placed on the evolution of property rights under conditions of imperfect information. This case study illustrates (a) the nature of scientific and economic incentives for institutional change due to technological innovation and (b) the process of institutional choice in a policy environment characterized by biological uncertainty and economic power. (abstract)

Richards, Alan. 1993. Strengthening Markets to Build Peace: The General Case, Illustrated by the Example of Agriculture and Water. Conference on the Middle East Multilateral Conference. Los Angeles: University of California, Los Angeles, June. Proposes a statement of principles and policy suggestions for agricultural/water use in Israel-Jordan-Palestine. Strengthening the markets in the region (and working around the contradictory politics and economics already in place) will better the standard of living, but require more cooperation and more contact among peoples.

Rizk, Edward. 1964. *The River Jordan*. Information Paper, Vol. 23. New York: Arab Information Center. Like other books on the dispute, the short history is punctuated by the plans for division of the Jordan, and then Rizk follows with brief chapters entitled "The Dangers of Israel's Jordan Diversion Project" and "Analysis of Some Israeli and Zionist Arguments."

Rogers, Peter. 1969. A Game Theory Approach to the Problems of International River Basins. *Water Resources Research* 5 (4, August): 749–60. The lower Ganges and the Brahmaputra rivers flow out of India and join together in the province of East Pakistan to form one of the major river systems in the world. Each year the rivers flood during the monsoon causing loss of life and great damage to crops and property. The problem is further exacerbated by the fact that the best flood control points in the basin are not under the political control of Pakistan, which suffers most from the floods. The number of possible combinations of structural and nonstructural variables for this river system is so large that conventional methods of analysis are inadequate. We demonstrate that by use of systems analysis techniques, including linear programming and game theory, we are able to consider a rational plan to control the floods while taking advantage at the same

time of the complementalities which exist between flood control and other possible uses for the river, such as power production, irrigation, navigation, and salinity control. Moreover using the concepts of game theory we are able to investigate a range of strategies for cooperation between the two riparian nations which will result in significant benefits to each. (abstract)

—— 1991. International River Basins: Pervasive Unidirectional Externalities. The Economics of Transnational Commons. Universita di Siena, Italy, 25–27 April. The paper reviews the phenomenon of international river basins and concludes that sharing of river basins between and among countries is the rule rather than the exception for the major river systems of the world. More than 200 river basins, accounting for more than 50% of the land area of the earth, are shared by two or more nation-states, powerful and often jealous social units that dominate what is still an age of nationalism. When population densities were low there was plenty of water for all and major conflicts were avoided. With the rapid population and economic growth experienced in the past few decades conflicts over use of water are becoming more important. It is expected that in the near future these water conflicts will become much more severe. The paper reviews the literature on attempts to analyse the conflicts and negotiate solutions. One interesting finding is that the upstream-downstream externalities are not always negative; there are many cases where upstream development of water resources leads to increased benefits to downstream users. Some rudimentary game models are examined and some tentative conclusions, based upon various game theory concepts of stability are presented. The paper ends with suggestions on how to plan Pareto-admissible outcomes for international basins. (abstract)

—— 1993. Integrated Urban Water Resources Management. *Natural Resources Forum* (February): 34–42. The focus of this article is the organizations and institutions of water-resources management strategies. Economic aspects of planning for urban water use are concentrated on heavily. Ensuring that each utility covers operating costs as well as capital costs by the economic pricing of water use is stressed as a needed policy improvement.

—— 1993. The Value of Cooperation in Resolving International River Basin Disputes. *Natural Resources Forum* 17(2): 117–31. The purpose of this paper is to review the phenomenon of international river basins, and concludes that the sharing of river basins between and among countries is the rule rather than the exception for the major river systems of the world. Included is a review of the literature which attempts to analyse river basin conflicts and negotiated solutions. Some game models and tentative conclusions are made on the basis of various game theory concepts of stability in an application to the Ganges-Brahmaputra basin.

—— R. Burden, and C. Lotti. 1978. Systems Analysis and Modeling Techniques Applied to Water Management. *Natural Resources Forum* 2: 349–58. Discusses modelling of multiple-use water management, including benefit-costs analysis and overlapping institutional-political boundaries.

Ross, Lee, and Constance Stillinger. 1991. Barriers to Conflict Resolution. *Negotiation Journal* 7 (4, October): 389–404. Discussion of barriers to conflict resolution: Secrecy and deception, intransigence, psychological barriers, and additional complexities. Also a discussion of improving negotiation techniques (''pump-priming'').

Rowley, Gwyn. 1993. Multinational and National Competition for Water in the Middle East: Towards the Deepening Crisis. *Journal of Environmental Management* 39: 187–97. This brief paper introduces the highly sensitive and contentious subject of international competition over water resources within the Middle East. Attention is directed to the general aridity of the Middle East, the multinational nature of the region's three major river basins – the Jordan, the Tigris-Euphrates and the Nile, the lack of regulatory authority to mediate upon water-resource allocations, and the mounting internecine animosities be-

tween the various states within the region. The potential for major larger-scale conflict over water in the Middle East is seen to be increasing. (abstract)

Sadler, B. 1990. Sustainable Development and Water Resource Management. *Alternatives* 17(3): 14–24. Focuses on evaluating the contributions that sustainability concepts can make to the theory and practice of water-resource management. Water-resource management should be used as a basis for the unification of environmental, economic, and social concerns, however, it is hampered by incomplete understanding of resource systems and their productivity, resilience, and vulnerability to cumulative impacts. The paper discusses the limitations of the Canadian Federal Water Policy and the planning framework being pursued in the Great Lakes basin by the International Joint Commission which is based on an ecosystem perspective of the Lakes as a functional entity. The author follows the decision-making process that led to the construction of the Dixon dam on the Red Deer river, Canada, and concludes with some lessons for the future. (M.Z. Barber)

Salewicz, K.A. 1991. Management of Large International Rivers – Practical Experience from a Research Perspective. In *Hydrology for the Water Management of Large River Basins*, ed. F.H. Van de Ven et al., 57–69. International Association of Hydrological Sciences. Experience gained from research conducted at the International Institute for Applied Systems Analysis is presented. Water management issues for two case study rivers – the Danube and the Zambezi – are briefly presented, and then experiences in dealing with institutional and organizational aspects of the research are examined. Conclusions summarize both positive and negative experiences and recommendations are made concerning further activities in this field. (abstract)

Saliba, Samir N. 1968. *The Jordan River Dispute*. The Hague: Martinus Nijhoff. Discusses history, including details of pre- and post-partition plans for the Jordan by Ionides, Lowdermilk, Hays, McDonald, Bunger, Israel, and Arabs. Discusses Syria, Lebanon, Jordan, and Israel. Covers international law, attempts at resolutions such as Johnston, Baker-Harza, Unified plan, and the Cotton plan. Looks at other regional disputes as well, including the Rio Grande, Columbia, Indus, Danube, and legal solutions.

Schaake, J.C., R.M. Ragan, and E.J. Vanblargan. 1993. GIS Structure for the Nile River Forecast Project. In *Application of Geographic Information Systems in Hydrology and Water Resources Management*, ed. K. Kovar and H.P. Nachtnebel, 427–31. International Association of Hydrological Sciences. The Nile Forecast System is being developed to predict inflows into the Aswan dam in Egypt. The system contains a set of hydrological models that are structured as a grid point, distributed modelling system. The system also contains a geographic information system (GIS) component in order to create map displays and to define the parametric hydrological input for each grid cell. The terrain analysis software developed uses elevation and stream data to define important hydrological parameters such as the gridded flow connectivity, drainage areas, flow lengths, and slopes. (abstract)

Schmida, Leslie. 1983. *Keys to Control: Israel's Pursuit of Arab Water Resources*. Washington, DC: American Educational Trust. A political history from 1919 to 1976 of Israel and the water uses it incurred over the years. Its tone sounds a little conspiratorial. It moves topic by topic through issues such as the National Water Carrier, The Johnston Plan, the West Bank, the Golan Heights, and Legal Issues.

Scudder, T. 1989. The African Experience with River Basin Development. *Natural Resources Forum* (May): 139–48. The purpose of this paper is to examine the record to date of river basin development in tropical Africa and in more detail the role and performance of institutions in this record of African river basin development. There is an assessment made of the experience of institutions with river basin development against the extent to which the resources of Africa's river basins have been developed in recent years and the role that institutions have played in that development.

Secretariat of the United Nations Commission for Europe. 1994. Protection and Use of Transboundary Watercourses and International Lakes in Europe. *Natural Resources Forum* 18(3): 171–80. This article analyses developments in national strategies and policies for the protection and use of transboundary water in Europe. In addition, it describes the progress made by European states in their cooperation on these issues. Particular attention is focused on the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) pending its entry into force. (abstract)

Sellers, Jackie. 1993. Information Needs for Water Resources Decision-making. *Natural Resources Forum* (August): 228–34. Developing data and information systems is a never completed process, with continual updates and modifications. The purpose of this article is to identify the components of information needed to facilitate the planning process for resources utilization. This process is identified by Sellers as the proper development of Management Information Systems (MIS) or Decision Support Systems (DSS).

Shady, A., A. Adam, and K. Mohammed. 1994. The Nile 2002: the Vision Toward the Cooperation in the Nile Basin. *Water International* 19(2): 77–81. The Nile 2002 conference series started in February 1993 in Aswan, Egypt and was followed by the second in Khartoum, Sudan in January 1994. Both conferences dealt with the same general theme of ''Comprehensive Water Resources Development of the Nile Basin.'' The Khartoum conference dealt with forty-two papers, including nine country papers from the Nile Basin, and several discussion series. The main feature of these papers is the emphasis on the need for cooperation among the co-basin countries and assistance from external support agencies and internal organizations. A comprehensive set of cooperation modalities, principles, and areas of potential support for external support agencies is identified. Institutional aspects are also examined emphasizing the complementary role of governmental, international support agencies, and nongovernmental organizations. (abstract)

Shah, R.B. 1994. Inter-state River Water Disputes: A Historical Review. *Water Resources Development* 10(2): 175–89. India has a federal set-up and about 80% of water resources are derived from interstate rivers. There have naturally been a number of disputes among the states regarding allocation and utilization of waters of interstate rivers. This article provides a historical review of the resolution of such disputes under the present constitutional provision and the experience gained. (abstract)

Sherk, G.W. 1989. Equitable Apportionment After Vermejo: The Demise of a Doctrine. *Natural Resources Journal* 29: 579–83. Historically, the Supreme Court has resolved interstate water conflicts under the doctrine of equitable apportionment. The decisions of the Court regarding a conflict between Colorado and New Mexico over the waters of the Vermejo river, however, have established burden of proof requirements that may eliminate equitable apportionment as a means of resolving interstate water conflicts. This article discusses the historical development of the doctrine and reviews the Vermejo decisions. Alternative means of resolving interstate water conflicts are discussed. Finally, given the inevitability of litigation regardless of which means of resolving interstate conflicts is selected, alternative litigation strategies are considered. (abstract)

Shrestha, Hari Man and Lekh Man Singh. 1995. The Ganges-Brahmaputra System: A Nepalese Perspective in the Context of Regional Cooperation. In *Asian Water Forum*. Asian Water Forum. United Nations University, 30 January–1 February. Discusses shortcomings of past efforts and negotiations. Includes a list of proposals not conducive to cooperation and water availability. Includes a proposal of an Indian-Nepalese water-sharing agreement.

Shuval, Hillel. 1992. Approaches to Resolving the Water Conflicts Between Israel and her Neighbors – a Regional Water-for-Peace Plan. *Water International* 17: 133–43. The disputes over surface and ground water resources between Israel, Jordan, and the Palestinians are particularly acute since all three are well below the Water Stress Level of 500

cubic metres/person/year as defined by Falkenmark. Based on currently accepted principles of international water law neither the upstream source country nor the downstream historic user country has absolute sovereign rights to control the use of international bodies of surface or groundwater. An accommodation, based on the principles of equitable apportionment and community of interest, considering the legitimate needs of each partner to the dispute, should be arrived at through direct negotiations. Since the total amount of water resources available is insufficient, it is a zero sum game and any attempt to find a solution by reallocation of the limited resources between the disputants is likely to lead to a deadlock. The approach proposed is to increase the size of the pie by developing a regional Water-for-Peace Plan. This would be funded by the major powers and import water from water-rich neighbouring countries such as Egypt, Lebanon, and Turkey, and/or desalinate seawater. However, it is proposed that baseline allocations be assured for ''water security'' for domestic, urban, industrial and fresh food supply needs of about 125 cubic metres/person/year. This should be abstracted directly within the territory of each side. (abstract)

Simms, R.A. 1989. Equitable Apportionment – Priorities and New Uses. *Natural Resources Journal* 29: 549–63. The doctrine of equitable apportionment was initially articulated as a conflict of laws doctrine designed to resolve the over-appropriation of an interstate stream resulting from the accumulation of rights perfected under differing regimes of water law. The doctrine also addresses such conflicts between states applying the same doctrine of water law. Historically, an equitable apportionment has been realized by the application of the doctrine of prior appropriation interstate between prior appropriation states, varying the doctrine only to protect economies predicated on junior appropriations. Recently, the Court appears to have changed the doctrine of equitable apportionment, suggesting that priority of appropriation might be varied to supplant existing uses with new uses of higher economic value. The new direction in equitable apportionment marks a radical departure from settled precedent. (abstract)

Smith, Scot E. and Hussam M. Al-Rawahy. 1990. The Blue Nile: Potential for Conflict and Alternatives for Meeting Future Demands. *Water International* 15(4): 217–22. Despite nearly a century of water regulation projects on the Nile basin, today Egypt faces a genuine crisis with respect to water supply. The crisis has been brought on by a combination of drought and greatly increased usage by all riparian nations along the Nile. It is highly probable that Egypt will need to search for new sources of water, reallocate existing water supply and reduce demand simultaneously in order to stave off major water shortfalls. It is unlikely that these measures can be accomplished without both internal and external conflict. This paper describes the current state of water supply and usage in Egypt. Further we examine potential sources of conflict over water allocation decisions. Finally, the paper presents a method for evaluating alternative strategies that could be implemented by Egypt to avoid future conflict. (abstract)

Sohn, Louis B. 1987. Peaceful Settlement of Disputes and International Security. *Negotiation Journal* (2, April): 155–66. A law professor offers his advice on dispute settlement methods, noting that the UN charter only says methods should be peaceable, but gives no framework. He therefore offers some settlement methods.

Solanes, Miguel. 1992. Legal and Institutional Aspects of River Basin Development. *Water International* 17: 116–23. Solanes discusses international law principles and procedural means for the effective application of those principles. He also touches on issues of international law such as joint development on rivers and equitable use.

Spalding, Mark J. 1995. Resolving International Environmental Disputes: Public Participation and the Right-to-Know. *Journal of Environment and Development* 4 (1, Winter): 141–54. The North American Free Trade Agreement is the first trade pact that provides considerable protections for a country's environmental standards. The environmental side

agreement to the NAFTA, negotiated at the insistence of and with the participation of environmental groups, has promoted the important roles in environmental regulation and enforcement played by the principles of transparency (right-to-know) and public participation (right-to-sue). The side agreement provides for: citizen submissions to the Secretariat of the North American Commission for Environmental Cooperation; the US, Mexican, and Canadian governments' guarantees of citizens' right-to-know, as well as citizen suits and remedies regarding environmental harm and requests for enforcement of environmental laws. As procedures under the NAFTA and its environmental side agreement are developed, opportunities remain to incorporate the principles of transparency and public participation even more broadly. (abstract)

Sprinz, Detlef. 1995. Regulating the International Environment: A Conceptual Model and Policy Implications. In *Prepared for the 1995 Annual Meeting of the American Political Science Association*. 1995 Annual Meeting of the American Political Science Association. Chicago, IL, 31 August–3 September. The present scale of production and consumption is likely to generate adverse externalities (pollution). The dangers posed by pollution infringe on the welfare of countries, depending on the type of environmental problem they face. While research is under way which links environmental degradation to the onset of civil and international war, this article focuses on the non-military instruments which governments can use to improve the state of their environment. After briefly reviewing the literature on the relationship between environmental degradation and the onset of civil and international conflict, the basic model of environmental regulation in a closed economy will be developed; these assumptions will be relaxed step-by-step by introducing transboundary pollution, international trade, and global environmental problems. Furthermore, a brief sketch is provided for how to turn the static treatment into a simple dynamic perspective on defining and achieving environmental security. In the penultimate section, some suggestions for further refinement of the concept presented here are made before turning to a summary of the conclusions. (abstract)

Stahl, Michael. 1993. Land Degradation in East Africa. *Ambio* 22 (8, December): 505–08. The highlands of East Africa have a high agricultural potential and have historically supported kingdoms with stratified social structures. Today, traditional fertility practices cannot be maintained under conditions of mounting population growth and land scarcity. Land degradation is now threatening the very basis of the farming communities. This paper discusses land degradation in East Africa in the context of soil conservation. It describes technical and institutional responses to land degradation including regional cooperation and concludes that degradation is not yet irreversible. Relatively low-cost technologies exist that have the potential, given supportive institutions and incentives, to achieve widespread adoption among smallholders. (abstract)

Starr, Joyce R. and Daniel C. Stoll, eds. 1988. *The Politics of Scarcity: Water in the Middle East*. Boulder, CO: Westview Press. By the year 2000, the Middle East will confront yet another serious challenge to regional stability as Egypt, Jordan, Israel, and Syria cope with significant water shortages. The emerging crisis will involve actual water shortages, inefficient management practices, and deterioration of water quality. The authors review available water technologies such as desalination, water re-use processes, and large-scale engineering projects that might alleviate regional water shortages, with special consideration given to the recently proposed ''Peace Pipeline'' from Turkey. The book describes US government agency involvement with water issues and evaluates their respective programmes and development projects. (abstract)

—— and Daniel Stoll. 1987. *U.S. Foreign Policy on Water Resources in the Middle East*. Washington, DC: The Center for Strategic and International Studies. Overviews some water security issues, and the Nile basin as a case study in relations. The authors give a detailed account of United States policy structure on water resources, and also make some recommendations for change in the US policy.

Stein, Janice Gross. 1985. Structures, Strategies, and Tactics of Mediation: Kissinger and Carter in the Middle East. *Negotiation Journal* (October): 331–47. History and analysis of Kissinger's and Carter's different styles of negotiation, starting with Kissinger in 1973.

—— 1988. International Negotiation: A Multidisciplinary Perspective. *Negotiation Journal* (July): 221–31. Addresses negotiation in terms of game theory and history.

Stone, Paula J. 1980. A Systems Approach to Water Resource Allocation in International River Basin Development. *Water Resources Research* 16 (1, February): 1–13. A methodology is presented to assist the water resource systems analyst in providing and interpreting technical information to promote coordinated water resource use in international river basin development. The international river basin planning environment is examined to identify the analytical information which can address and satisfy comprehensive decision-making requirements. This information is organized wthin a multilevel decomposition framework that permits an analysis of the implications of alternative resource development patterns in terms of nations both achieving their objectives and pursuing development strategies that will lead to feasible basin-wide resource use. The proposed methodology is applied to an example of international river basin planning with the generation of resource transformation curves, and results are examined for their appropriateness as bases for coordinated development. (abstract)

Sun, Peter. 1994. *Multipurpose River Basin Development in China*. Economic Development Institute Seminar Series. Washington, DC: Economic Development Institute of the World Bank. This publication describes the discussions at a Senior Policy Seminar on Policies for Multipurpose River Basin Development in China held on 31 March–21 April 1990, in Nanjing, China, and jointly sponsored by the Science and Education and Foreign Affairs departments of the Ministry of Water Resources, China, and the Economic Development Institute of the World Bank. In 1989 China's Ministry of Water Resources had identified a strong need for such a seminar. The minister had indicated that following the seminar, which would re-examine policies in effect for water resource development in China, a report would be produced that would be and become the basis for future policy formulation. A set of lecture papers and discussion notes from the seminar was published in China in 1991 (in Chinese) in response to the minister's request. This publication is an abbreviated English language version that focuses on the seminar's conclusions and recommendations. (abstract)

Szekely, A. 1993. Emerging Boundary Environmental Challenges and Institutional Issues: Mexico and the United States. *Natural Resources Journal* 33 (1, Winter): 33–58. The purpose of this article is to examine the emerging transboundary resource and environmental issues that are impacting, or will be in the near future, the border region between Mexico and the United States. In addition, an analysis is also made on what type of institutions will be needed to deal with the issues in order to secure the necessary bilateral cooperation. Szekely also suggests that the relationship between the United States, Mexico, and Canada must also be explored for possible trilateral agreements.

—— 1993. How to Accommodate an Uncertain Future into Institutional Responsiveness and Planning: The Case of Mexico and the United States. *Natural Resources Journal* 33 (Spring): 397–403. This article is a short review of the history of bilateral agreements between Mexico and the United States and the International Boundary and Water Commission. The author suggests there is an immediate need to call attention to the uncertain future problems for more in-depth planning of response by Mexico and the United States. For a more detailed discussion by Szekely on this topic see the article, Szekely, Alberto. 1993. Emerging Boundary Environmental Challenges and Institutional Issues: Mexico and the United States. *Natural Resources Journal* 33 (Winter): 33–58.

Tahovnen, Olli, Veijo Kaitala, and Matti Pohjola. 1993. A Finnish-Soviet Acid Rain Game: Noncooperative Equilibria, Cost Efficiency, and Sulfur Agreements. *Journal of Environmental Economics and Management* 24: 87–100. This study analyses cost effectiveness

in environmental cooperation between Finland and the Soviet Union. It is assumed that the aim of both countries is to attain a given target deposition level at minimum possible sulphur abatement costs. Cost-effective cooperation is compared to noncooperative equilibirum and to the agreement on sulphur emissions between these two countries. It is shown that the agreement is not cost-effective, implies higher abatement costs than under noncooperation, and is strategically unstable. However, the cost differences and the incentives to cheat are small. The computations reveal that the main source of potential cooperation benefits is not asymmetrical emission transportation or differences in abatement costs but rather different target depostition levels for Finland and the Soviet Union. (abstract)

Talbot, A.R. 1983. *Settling Things: Six Case Studies in Environmental Mediation*. Washington, DC: The Conservation Foundation and Ford Foundation. Documents six environmental disputes in the USA settled with the assistance of a mediator, and draws a number of conclusions. The disputes were: (1) the extension of Interstate 90 across Lake Washington into Seattle: some environmentalists were dissatisfied with the result; (2) resolution of river disputes on the River Hudson, including the dropping of plans to construct the Storm King power plant; (3) a dispute over the use of hydropower from a lake at Swanville, Maine: a local committee was established and min-max water levels agreed; (4) when access to a proposed park on Portage Island, Washington was affected by Indian rights, the Lummi tribe agreed to purchase the island and establish the park; (5) resolution of a waste disposal plan involving the implementation of the Wisconsin Environmental Policy Act: the towns of Eau Claire and Seymour (the proposed dump site) agreed conditions of dumping; and (6) when agreement was reached between local protestors and the developer at Port Townshend, Washington, over the siting of a ferry terminal. (R. Land)

Teclaff, L.A. and E. Teclaff. 1994. Restoring River and Lake Basin Eco-systems. *Natural Resources Journal* 34 (Fall): 905–32. Suggesting that water management policy is shifting from being development dominated to focusing on environmental values, this article examines examples of damage to ecosystems in the past, the restoration techniques currently being used, and relevant developments in domestic and international water law and policy. Strategies are suggested in the concluding section for the restoration of damaged aquatic ecosystems in a transboundary context.

Touval, Saadia. 1987. Frameworks for Arab-Israeli Negotiations – What Difference do They Make? *Negotiation Journal* (January): 37–52. Discusses the conditions for Arab-Israeli meetings, such as places for the meeting and the nature or nationality of the mediator. Israel's preferences for negotiation changed over the years, and the Arab preferences much more so. A discussion of the superpowers is also included.

Trevin, J.O. and J. Day. 1990. Risk Perception in International River Basin Management: The Plata Basin Example. *Natural Resources Journal* 30 (1, Winter): 87–105. Perception of the risk of multilateral cooperation has affected joint international action for the integrated development of the Plata river basin. The origins of sovereignty concerns among Argentina, Bolivia, Brazil, Paraguay, and Uruguay are explored in terms of their historical roots. The role of risk in determining the character of the Plata Basin Treaty, and the ways in which risk was managed in order to reach cooperative agreements, are analysed. The treaty incorporates a number of risk management devices that were necessary to achieve international cooperation. The institutional system implemented under the treaty produced few concrete results for almost two decades. Within the current favourable political environment in the basin, however, the structure already in place reopens the possibility of further rapid integrative steps. (abstract)

Turan, Ilter. 1993. Turkey and the Middle East: Problems and Solutions. *Water International* 18 (1, March): 23–29. Three types of solution have been proposed regarding the intensifying problems generated by insufficient water in the Middle East: (1) increasing the

amount of available water; (2) redistributing the existing supply of water; and (3) using the existing water supply more efficiently. In the search for solutions, it is argued that the so-called water problem in the region should be disaggregated, and that each river system should be treated as a separate problem area since the needs and the political relations between the riparians are different in each case. Then, several plans to resolve water insufficiencies are discussed, such as transporting water from Turkey via a pipeline to the Gulf and via super tankers to any needy country in the region; reaching a regional agreement to pursue policies of water conservation, including the adoption of water-saving technologies and founding an international bank to support the adoption of these technologies; and, launching by riparian states of schemes to study land quality and patterns of water use as a preliminary step to further cooperation. It is concluded that the long-term solutions to water shortages necessitate an effort to control and reverse the trends that generate demands for larger and larger quantities of water. (abstract)

Ury, William L. 1987. Strengthening International Mediation. *Negotiation Journal*, July, 225–241. Ury focuses on six recurrent opportunities for an enlarged role of mediators: Start without being asked; Catch conflicts before they heat up; Getting parties to the table; Trying out innovative mediation techniques; Coordinating third party efforts; and following up after a mediator has left.

—— Jeanne M. Brett and Stephen B. Goldberg. 1988. Designing An Effective Dispute Resolution System. *Negotiation Journal* (October): 413. The authors provide a variety of ways to implement ADR techniques, from prevention to back-up and final offers. This article is a common reference and considered seminal.

Valencia, M.J. 1986. Taming Troubled Waters: Joint Development of Oil and Mineral Resources in Overlapping Claim Areas. *San Diego Law Review* 23: 661. Many offshore areas with mineral or petroleum potential are claimed by more than one nation. Joint development is an arrangement by which such nations can avoid questions of sovereignty through joint exploration and development of any resource in an agreed area. Frequently appearing elements in precedents for joint development include: the extent of the area; the contract type; financial arrangements; the process of selection of concessionaires or operators; the length of the agreement; and the nature and functions of the joint management body. Geology plays a fundamental role in the selection and evolution of joint development agreements. The sucess of joint development agreements is dependent on the given knowledge of actual deposits, good political relations, practical mindedness, and cooperative private companies. (abstract)

Van der Keij, W., R.H. Dekker, H. Kersten, and J.A. De Wit, W. 1991. Water Management of the River Rhine: Past, Present, and Future. *European Water Pollution Control* 1(1): 9–18. The present condition of the River Rhine is a result of one-sided management that was aimed only at security against floods and at the river's function as a shipping route. For some decades now, river management has also been aimed at amelioration of the water quality. This has led to a certain degree of ecological restoration in recent years, as compared to the all-time low water quality round 1970. The Sandoz calamity has made it clear that the protection of the drinking-water supply and of the river's ecosystem was still insufficient. A further restoration of the river ecosystem necessitates, next to water-quality improvement, morphological adjustments as well as consideration of the relations between the river and its floodplains. Only integral river management makes this possible, where all interests and functions of the river are taken into account from the beginning of every project, and optimum solutions are sought through cooperation of all disciplines concerned. A strengthening of international cooperation is necessary. In time we shall have to come to an international water authority for the management of the River Rhine. (abstract)

Van de Ven, F.H., D. Gutknecht, D.P. Loucks, and K.A. Salewicz. 1991. *Hydrology for the*

Water Management of Large River Basins. Proceedings of an International Symposium, Vienna, August 1991. International Association of Hydrological Sciences. Contains 37 papers presented at a symposium designed to improve understanding of the various hydrological processes and to investigate tools and methods that can be used to analyse hydrological impacts of anthropogenic activities. Case studies from many rivers, including the Zambezi, Mekong, and Nile are included. Papers are divided into four themes: water-management and cooperation in large and/or international river basins (6 papers); flow regimes and water management in relation to climate changes, river development and land use (19); water quality and sediment transport management (4); and operational flow and water quality forecasting (8). Fourteen papers are abstracted separately. (N. Davey)

Verghese, B.G. 1995. Towards An Eastern Himalayan Rivers Concord. In *Asian Water Forum*. Asian Water Forum. United Nations University, 30 January–1 February. History of the Indo-Gangetic plain, water difficulties, Farakka issue. Includes Nepal in the analysis, and even Bhutan. Verghese does not believe that the water issue is a zero sum game.

Vidal-Hall, J. 1989. Wellsprings of Conflict. *South*. The rapid rise of urbanization, population growth, industrial and agricultural development are depleting the once-abundant water resources of the Middle East. With three river systems shared by all the states, water bids fair to replace oil as the precious commodity of the future. (abstract)

Vlachos, Evan. 1986. *The Management of International River Basin Conflicts*. Washington DC: George Washington University Press. Another large conference results in a large body of aggregate material from it. Many people contributed to this work with their presentations. Each section offers approaches to transboundary river dispute resolution: Case Studies, Decision Support Systems, Conclusions/Recommendations, and Other River Basins of Interest.

Wagner, R. Harrison. 1983. The Theory of Games and the Problem of International Cooperation. *American Political Science Review* 77 (June): 330–46. Argues that the Prisoner's Dilemma and the Stag Hunt are inadequate models of international politics, and that a security dilemma does not necessarily have the implications people usually assign it.

Wakil, Mikhail. 1993. Analysis of Future Water Needs for Different Sectors in Syria. *Water International* 18 (1, March): 18–22. Water demands for different sectors in Syria have been increasing steadily and at a high rate, and it is expected that by the year 2010 the country will face a deficit in its water balance. To define the importance and the evolution of the projected water shortage, an analysis of the future water needs for the domestic, agricultural, and industrial sectors is performed. The actual water consumption in Syria for different sectors is estimated at about 12 billion m^3/yr, 90 per cent of which are consumed to irrigate about 700×10^3 ha. At the completion of the currently planned irrigation projects, which are expected to be finished by the year 2020, the irrigated areas will amount to 1350×10^3 ha, and will consume 20.5 billion m^3/yr. Sixty per cent of the new areas brought under irrigation will rely on the waters of the Euphrates river and its tributary, Al-Khabour. Within the same period, the Syrian population will reach approximately 32 million inhabitants who will consume 3.5 billion m^3/yr for domestic, municipal, and industrial uses. The available water resources in Syria are estimated at about 23.5 billion m^3, taking into account the Syrian share of the Euphrates river (13 billion m^3). Ten per cent of this amount is lost by evaporation. Therefore, it is expected that by the year 2010, Syria will reach an equilibrium in its water balance. However, starting from this date, it will experience an ever increasing water deficit. This situation will curtail future development plans and lead to decreased standards of living. It could further be a serious source of conflict in the Middle East if no agreement is reached regarding the allocation of Euphrates water. (abstract)

Waterbury, John. 1992. Three Rivers in Search of a Regime: The Jordan, the Euphrates and the Nile. William Stewart Tod Professor of Public and International Affairs, April. In this

paper, we shall look at three Middle Eastern rivers that cross international boundaries and for which there are no binding, comprehensive accords governing their use. The three are the Jordan, the Euphrates, and the Nile. They will be treated in that order as it corresponds to a descending order of difficulty in obtaining cooperation among the riparian states in their basins in joint use of their water. The basic facts concerning the amounts of water available and current patterns of usage are fairly well know, and I shall make no attempt to go over them systematically here (inter alia, see Gischler, 1979; Naff and Matson, 1984; Starr, 1988; Kolars, 1992; Army Corps of Engineers, 1991; Allan Howell, 1990; Lowi, 1990; Waterbury, 1979 and 1983). (abstract)

White, Sally Blount and Margaret A. Neale. 1991. Reservation Prices, Resistance Points, and BATNAs: Determining the Parameters of Acceptable Negotiated Outcomes. *Negotiation Journal* 7 (4, October): 379–88. Defines terms of negotiations: BATNAs, Resistance Points, Reservation Prices, and the conjunctive use of two or more of the above. Empirical findings regarding these ideas are presented.

Whittington, D. and Kingsley Haynes. 1985. Nile Water for Whom? Emerging Conflicts in Water Allocation for Agricultural Expansion in Egypt and Sudan. In *Agricultural Development in the Middle East*, ed. Peter Beaumont and K. McLachlan. New York: John Wiley and Sons. The paper discusses agriculture and water use in Egypt and Sudan. It also reviews the 1959 Nile Waters Agreement. It offers a plan for long-term efficient water use.

—— and E. McClelland. 1992. Opportunities for Regional and International Cooperation in the Nile Basin. *Water International* 17(3): 144–54. Prospects for the Upper Nile basin states of Egypt, Sudan, and Ethiopia point to increasing competition for Nile water resources as population and development pressures intensify for all involved. This paper argues that it is in no one's best interest to maintain the lack of coordination in river basin development that persists in the Nile valley. Decisions made today about investment in water development projects, new irrigation schemes, and industrial projects will have consequences far into the future when water resources are in much greater demand. Furthermore, the unanticipated environmental and climatic changes of the 1980s have accelerated the need to make economic, political, and legal adjustments in the existing Nile management and allocation regime. Three possibilities are examined for cooperation in river basin development, with an emphasis on the importance of taking a basin-wide perspective on future water planning and investment. (abstract)

Wolf, A.T. 1993. The Jordan Watershed: Past Attempts at Cooperation and Lessons for the Future. *Water International* 18 (1, March): 5–17. Scarcity of water resources in the Mideast has led to bitter, occasionally armed, conflict; to generally undiscussed complications in political negotiations; and to unique opportunities for dialogue among the hostile actors of the Arab-Israeli conflict. This paper suggests a process of conflict resolution by which the dispute over the waters of the Jordan River watershed might be approached. Focus is on the ''hydro-political'' relations among Israelis, Jordanians, and Palestinians of the West Bank and Gaza. The process is designed for a hypothetical mediator, and the disciplinary tools he or she might use are described. In conjunction with regional peace talks and development plans, a four-step process for conflict resolution is developed, with political, management, and technical options explored. In addition, a large-scale project for the creation of power and water that may help ease regional political tensions is proposed. The paper is organized into three major sections: (1) background to Mideast ''hydropolitics;'' (2) a conceptual model for conflict resolution; and (3) four steps to water conflict resolution. (abstract)

—— and M. Murakami. 1995. Techno-political Decision Making for Water Resources Development: The Jordan River Watershed. *Water Resources Development* 11(2): 147–62. Discussions on water resources development generally focus on a variety of technical options, often without considering the potential repercussions of each option. This paper

incorporates both technical and political considerations in a ''techno-political'' decision-making framework. Water resources development alternatives are then examined to evaluate their respective priorities for development in Israel, Palestine, and Jordan, which are the major riparians of the Jordan river. Particular account is taken of the Middle East peace negotiations, and consequent political changes. Each proposal is designed to provide incentives for sharing resources and benefits among the riparian states. (abstract)

—— and T. Ross. 1992. The Impact of Scarce Water Resources on the Arab-Israeli Conflict. *Natural Resources Journal* 32: 921–58. The Jordan river watershed is included within the borders of countries and territories each of whose water consumption is currently approaching or surpassing annual recharge. The region is also particularly volatile politically, with five Arab-Israeli wars since 1948, and many tenacious issues yet unresolved. This paper suggests that scarce water resources are actually inextricably related to regional conflict, having led historically to intense, and sometimes armed, competition, but also to occasional instances of cooperation between otherwise hostile players. The focus on water as a strategic resource has particular relevance to policy options given, for example, Israel's reliance on the West Bank for a share of its water resources, and the water needs of at least one impending wave of immigration to the region. Included in the paper are sections describing the natural hydrography and water consumption patterns of the region, a brief history of political events affected by 'hydro-strategic' considerations, and a survey of some resource strategy alternatives for the future. (abstract)

Wood, W.B. 1992. Ecopolitics: Domestic and International Linkages. *Geographica* 27(1): 49–54. Czechoslovakia, landlocked in the heart of Central Europe, suffers the consequences of being both an exporter and importer of air and water pollutants. Bilateral and multilateral efforts to curb transboundary environmental degradation require an understanding of the linkages between domestic and international ecopolitics. This brief paper explores some of the economic and ecological ties that can be a source of conflict between countries as well as a means for closer environmental cooperation. Countries that share several common ecological concerns, such as Czechoslovakia and its neighbours, are at the forefront of testing international environmental institutions and political commitments to environmental quality. The success of their mutual efforts to resolve local, cross-border problems will determine whether the international community is ready to tackle the global ecological problems. (abstract)

World Bank/UNDP/UNEP. 1994. Aral Sea Program – Phase 1. Proposed Donors Meeting, 23–24. The main objective of this paper is to provide a briefing to the donor countries and international agencies on the Aral Sea Program – Phase 1 which was formulated by the Executive Committee (EC) of the Interstate Council (ICAS) with the assistance of a World Bank Mission. It will be discussed at the donors' meeting scheduled for 23–24 June 1994 in Paris. The paper is organized in seven sections: Background, Aral Sea Program – Phase 1, Program Prospects and Issues, Risks, Program Financing, Recommendations, and Next Steps. The paper discusses the Program and its issues in sufficient detail to enable donors to indicate their support. The paper is based on the World Bank Mission's Aide Memoire (Vols. 1 and 2), which provides more detailed information on specific projects. It includes, however, additional information. For example, it explains the implementation plan in greater detail, updates the cost estimates, discusses the Program's prospects, issues, risks and financing options, and proposes the next steps for follow-up actions. (abstract)

Yaron, Dan. 1994. An approach to the problem of water allocation to Israel and the Palestinian Entity. *Resource and Energy Economics* 16 (4, November): 271–86. This article reviews the water scarcity problem in Israel/Palestine, including discussion of conservation and supply augmentation. It also offers a method for allocation through price mechanisms.

Young, Ralph. 1991. The Economic Significance of Environmental Resources: A Review of

the Evidence. *Review of Marketing and Agricultural Economics* 59 (3, December): 229–54. The products and services of many environmental resources do not enter commercial markets and remain unpriced. The absence of market values presents a major difficulty for environmental projects in competing for ever-tightening budgets. In response to the need for assessing costs and benefits, a number of methods have been devised and applied to generate estimates of the value of unpriced resources. This paper reviews briefly the approaches employed for generating value estimates for unpriced environmental resources, with particular attention being paid to the contingent valuation method. Estimates of value for environmental products and services for both the United States and Australia are presented. This evidence clearly demonstrates that a wide range of unpriced environmental resources have significant economic value to the community. The paper concludes with a discussion of the implications for project development, funding, and policy in Australia. (abstract)

Zaman, Munir. 1982. The Ganges Basin and the Water Dispute. *Water Supply and Management* 6(4): 321–8. History of negotiations 1951–1977 and hydrologic data. Zaman discusses augmentation schemes and the Indian and Nepalese views of the Ganges dispute.

Zarour, H. and J. Isaac. 1993. Nature's Apportionment and the Open Market: A Promising Solution to the Arab-Israeli Water Conflict. *Water International* 18(1): 40–53. The populations and consumption levels of countries throughout the Middle East are steadily increasing and, correspondingly, their water demands. Water resources available to most of these countries remain more or less the same, if not being reduced by abusive utilization or pollution. Many now speculate that the region's next war will be fought over water. Today's international legislative structure is incapable of solving complex water disputes such as that of the Middle East. However, principles of international legitimacy provide the basis for solutions. This paper presents a pragmatic, practical, and dispassionate formula compatible with the principles of international law and legitimacy for dealing with international water resources allocation problems. The presented formula is built around resolving the Middle East's water conflict according to natural apportionment of resources and the open market approach. (abstract)

Zartman, I. William. 1978. *The Negotiation Process*. London: Sage Publications. Talks of negotiation as a social process and discusses decision-making in society. Covers game theory and some modifications of the Nash model.

—— 1992. International Environmental Negotiation: Challenges for Analysis and Peace. *Negotiation Journal* 8 (2, April): 113–24. Discusses the creation and analysis of the varied outcomes of international environmental negotiation. Identifies the challenge for all negotiators as the creation of the greatest Pareto-optimal outcome (the biggest pie possible with the largest shares possible for each party in the negotiations).