Transboundary Groundwaters: The Bellagio Draft Treaty*

Revised and Augmented by
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ABSTRACT

Increasing populations and industrials and agricultural development worldwide are placing much greater demands on groundwater supplies. Many of these groundwater basins or aquifers underlie two or more countries and are thus international or transboundary: Withdrawals from one country can drain life-giving water from a neighboring country and, as a consequence, be the source of severe and protracted conflict. Unfortunately international law and treaty practice are only at a beginning stage. With the goal of advancing international law and institutions on the matter, a multi-disciplinary group of specialists over an eight-year period have developed a draft international groundwater treaty.

The draft provides mechanisms for the international aquifers in critical areas to be managed by mutual agreement rather than continuing to be subjected to unilateral leaking. The treaty addresses contamination, depletion, drought and transboundary transfers as well as withdrawal and recharge issues. The fundamental goal is to achieve joint optimum utilization and avoidance or resolution of disputes over shared groundwaters in a time of ever increasing pressures upon this priceless resource.

The "black letter" provisions delegate only a limited amount of substantive discretion to the joint agency but above all they instruct the commission to lake the initiative subject to the governments approval in preparing for and confronting the full range of problems involving the Parties' transboundary groundwaters.

FOREWORD

Rapid population growth, and industrial and agricultural development are putting steadily increasing demands on groundwater resources worldwide. Cities from North Africa to Northern Europe, to Asia to North and South America have become critically dependent on groundwater. Irrigation use is widely on the rise. Potentially explosive international groundwater situations are escalating from places as diverse as India and Bangladesh, throughout the Middle East, Mexico and the United States, and Libya and Egypt. Treaty provisions and international

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agencies with jurisdiction over groundwater, where they exist, are quite limited in scope.

In many areas, shortages or the quality of surface water have caused farmers and municipalities above all in arid and semiarid regions, to expand the use of groundwater. The frequent result has been the over pumping of aquifers with the consequent deterioration of water quality, even the drying up of wells. Such overpumping can give rise to serious international conflict transcending the transboundary areas. The competition over water resources in, for example, the Israel-Jordan-Syria region can at best be described as extremely tense.

Groundwater, like surface water, often ignores political boundaries, and there are many large aquifers, which are shared by several countries. For example, the Northeastern African aquifer underlies Libya, Egypt, Chad, and Sudan; a vital European aquifer underlies the Rhine. On the Arabian Peninsula there are aquifers shared by Saudi Arabia, Bahrain, and perhaps Qatar and the United Arab Emirates and Jordan. There is a paucity of aquifer-wide data on most such groundwaters. Many are indispensable for engaging in agriculture and industry. Those groundwater basins and others like them are divided by international boundaries, and are likely to be in zones of present or future intensified development. Unfortunately the matter of adequate international law and institutions for peacefully managing the resource is only recently receiving the attention of the international community.

In view of this lack of legal and institutional arrangements in most cases, and the weakness of the few existing institutions dealing with international aquifers, the need for a model treaty became apparent. To meet this need a multidisciplinary group of specialists carefully crafted a draft international groundwater treaty. It is based on the proposition that water rights should be determined by mutual agreement rather than be the subject of uncontrolled, unilateral taking, and that rational conservation and protection actions require joint resource management machinery.

In order to minimize the intrusion into the sovereign sensitivities of independent countries three concepts are used:

1. rather than comprehensive administration along the entire border, control is to be asserted only in zones considered to be critical because withdrawals are exceeding recharge or contamination is threatening groundwater quality;

2. actual enforcement would be left to the internal administrative agencies of each country with oversight and facilitating responsibility lodged in an international agency; and

3. the "black letter" provisions delegate only a limited amount of substantive discretion to the joint agency, but above all they instruct the commission to take the initiative, subject to the governments approval, in preparing for and confronting the full range of problems involving the parties transboundary groundwaters.

In the case of the U. S. - Mexico border region the obvious candidate for the international agency is the International Boundary and Water Commission. The IBWC should be given authority, after government approval, to declare critical areas when water quantity is threatened by uncontrolled withdrawals or water quality is jeopardized.

Within declared international critical zones, measures such as regulating well spacing and pumping rates could be instituted to control withdrawals and thereby give each country security of its share of the water. The enforcement of these measures would be left to the responsible authorities of each nation within its own territory.

The draft suggests mechanisms for dealing with uncontrolled draw down, planned depletion, drought reserves, water quality, protection of recharge areas, and public health emergencies, along with procedures for settling disputes.

The overriding goal of the draft treaty is to achieve joint, optimum utilization of the available waters, facilitated by procedures for avoidance or resolution of differences over shared groundwaters in the face of the ever increasing pressures on this priceless resource.

Upon the joint initiative of Professor Albert Utton and Ambassador Cesar Sepulveda, a U.S.-Mexico Transboundary Resources Study Group was formed. This study group first met in Oaxtepec, Mexico in 1977. A working group under that initiative was assigned the task of examining the growing problems of transboundary aquifers along the two countries, extensive border. The group was expanded, and subsequent meetings were held in Ixtapa and Puerto Vallarta, Mexico. After consideration of many aspects and proposals, the study culminated in a tentative and unofficial draft agreement between the two countries. That "Ixtapa Draft" with an extensive introduction and commentary to the "black letter articles" was presented for discussion and published in 1985 in The Natural Resources Journal[1].

In the spring of 1987, a conference of experienced practitioners and scientists from many other parts of the world where transfrontier groundwater is of concern was convened at the Rockefeller Conference Center, Bellagio, Italy. The representative members of the working group exchanged views with those attendees who had not participated in the production of the Ixtapa Draft.[2] Each

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[1] Rogers & Utton, The Ixtapa Draft Agreement Relating to the Use of Transboundary Groundwaters, 25 Nat. Res. J. 715 (1985). The members of the working group are also there identified, Id. at 722.

[2] Participating were D. Caponera, Chm. Exec. Council. Int' Assoc. for Water Law; J. da Silva, Directorate General for Natural Resources, Portugal; E. Fano, Chief, Water Res. Br., U.N.; M. Haddadin, Pres. Jordan River Valley Auth.; C. Higgins. Institut des Haut Estudes, Geneva; T. Kahn, Exec. Engineer. Joint Rivers Commission, Min. of Irrig., Bangladesh; C. Ok.idi, Sr. Fellow, Univ. of Nairobi; M. Uk.ayli, Mgr. Div. of Water Res. and the Environment, Research Inst. , Univ. of Petroleum & Minerais, Saudi Arabia; E. Vlachos, Prof. Sociology, Colorado State Univ. From the working group were R. Cummings, Prof. Resource Economics, Univ. of New Mexico; L. Dworsky, Prof. Engineering, Comel1 Univ.; R. Hayton, Prof. Doctoral Faculty, City Univ. of N. Y.; W. Knedlik., atty in practice; G. Radosevich, Prof. Water Law, Dep't of Agricultural & Resource Economics, Colorado State Univ.; A. Szek.ely, Legal Adv., Secretariat of Foreign Relations, Mexico; A. Utton, Dir., Int'l Ctr. for Transboundary Res., Univ. of New Mexico School of Law.

article was systematically examined the experience obtaining in other regions was presented and considered. The assistance of the Ford Foundation then made it possible to bring key experts together to embark on a revision of the original draft.

The notes and tapes from the 1987 meeting became a principal basis for the preparation of a thorough revision of the initial Draft in early 1988, by Professors R. D. Hayton, G. E. Radosevich and A. E. Utton, to be called the "Bellagio Draft." This Draft was then circulated to the members of the original group and to those who had participated in the Bellagio Conference for comments. It was that set of revised provisions of agreement and commentary that was presented at a special Panel Session of the Sixth Congress of the International Water Resources Association in Ottawa the end of May, 1988, for the observations and suggestions of other specialists, including non-lawyer experts.

We were greatly assisted by the strategic assistance provided by the Ford Foundation, which made it possible to assemble the experts from various parts of the world both at Bellagio and for the revisions.

We are grateful for the detailed and pointed comments on the Bellagio Draft from a number of our colleagues, particularly Ludwik Teclaff, Ronald Cummings, Stephen McCaffrey, Charles Okidi, Alberto Szekely and Steve Mumme. Substantial expansion, final revision and editing were then undertaken during a "scholars in residence" period in Bellagio early in 1989, yielding this published result. Some of the substantive changes made do not meet fully the expectations and suggestions of our several contributors and advisors. Remaining inaccuracies and errors of judgment can be attributed only to the final revisers.

Appreciation is expressed to the Rockefeller Foundation, and to its staff at the renowned Villa Serbelloni Conference Center, for providing the one-month of careful and quiet reflection that made possible the many additions and adjustments deemed advisable in the last analysis. Mrs. Bonnie M. Hayton prepared the master copy in Bellagio; Ms. Barbara Jacques, of the University of New Mexico International Transboundary Resources Center, must be credited for carrying the changes, insertions and corrections into the computer.

There are those who may view the effort here reported as merely an "academic" exercise, lacking in the ingredients of political reality that a "real" treaty would have to contain. Such an evaluation may be correct, to a considerable extent. The black-letter provisions have been formulated, reformulated and further refined by professionals from the major the concerned disciplines - from hydrogeology to economics to engineering the to law, for example - with a focus on the physical, chemical and biological owns exigencies, in their larger social context, of the numerous and burgeoning met problems involved in sound management of groundwaters. The domestic and international political dimensions have not been ignored. Many members of the working group have had considerable political and

diplomatic experience themselves. Moreover, repeatedly the group has received direct inputs from persons in various governments.

On the other hand, it would have been pretentious as well as counter productive to attempt to anticipate ultimate political negotiations, which are often influenced by extraneous considerations. The objective has not left, been to "second guess" the diplomats or elected officials. The intention is to provide a technically and legally adequate and fairly comprehensive was set of provisions, explained and supported by commentary, addressed to arty the matter in hand. Most of the participants have had deep exposure over the years to the vagaries of U.S. - Mexico relations on a variety of fronts, or to analogous situations in other regions, or both. It would have been viewed as a grave disservice to the political and diplomatic community to provide a "politicized" or an inadequate-but-safe text, insufficient on its face and unable to gain the respect of the administrators, scientists, ding engineers, planners and commissioners who would have to "live with" and endeavor to implement such an international agreement.

The identified, basic requirements for present and future protection, control and equitable use are, it is believed, spelled out with accuracy and with awareness of the sensitivities connected with such transfrontier regulation. It is not the "ideal" or a "maximum" product; adjustment, up and down, to reflect the political will and foresight, or lack thereof, of the States parties is to be expected.

Negotiation of any type of international agreement can benefit from a working paper or preliminary draft, especially where such a draft has been elaborated by knowledgeable experts *not* representing a party in interest. At least it is not another hortatory exposition pointing with alarm without being specific about the legal framework, institutional mechanisms and measures and programs deemed essential in order that neighboring States might tackle, with flexibility and effectiveness, their critical the ground problems of the present and the foreseeable future.

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1. INTRODUCTION

A. Purpose of the Agreement

The point of departure for the step-by-step formulation of the early drafts of this agreement was clearly the situation along the arid Mexico-United States border. Efforts were made, nonetheless, in the "Ixtapa Draft" and pursued more rigorously thereafter, to provide language generally applicable to the contexts and conditions in those other parts of the world where the use and protection of transboundary aquifers and their waters might make such a special agreement and program advisable. Many of the participants at the 1987 Bellagio Conference felt, however, that treaty provisions that were not site specific would be too general

and lacking in coherence. The revisers were influenced by those concerns; thus, the U.S.-Mexico border region is still contemplated in this final version, but with an eye to ready application elsewhere with appropriate modifications. This should be true even between States with disparate legal traditions or systems, and different distributions of governmental powers, as is the case of Mexico and the United States.[1]

B. The Evolution of Transboundary Groundwater Law

The general, that is, the customary international law in the field of water resources is not regarded as especially advanced or consolidated. This is particular true of the general principles and rules applicable to transboundary aquifers and their waters. Nonetheless, international fluvial law has evolved significantly since it clearly emerged well over a century ago. And in recent decades, the needs of neighboring States in connection with their underground waters has resulted in comparatively rapid advances in this sub field.[2] The International Law Association, which produced the famous Helsinki Rules in 1966,[3] embracing for the first time is the groundwater dimension of "international drainage basins", has culminated its protracted study of the matter, renewed in 1968, with the adoption in 1986 of the Seoul Rule on International Groundwaters.[4] The Association thus felt that the topic was ripe for restatement, that is, unofficial codification.

Meanwhile the General Assembly of the United Nations tasked its International Law Commission to undertake the progressive development and codification of the Law of the Non-navigational Uses of International Watercourses.[5] In 1980 the Commission, after several years of deliberation, reported several tentatively approved articles to the General Assembly, adopting a systems approach, and a working hypothesis or Note of Understanding as to what

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[1] On the political dimensions another complexities of transfrontier questions in some federal systems (the U.S. example), see Ingram, *State Government Officials. Role in U.S./Mexico Trans Resources Issues*. 28 Nat. Res. J. 431 (1988) and works there cited.

[2] For a review of this evolution, see the Introduction to The Law of International Groundwater Resources, Part II, International Law Association (ILA), Seoul Conference (1986), Committee on International Water Resources Law, Report Of The Committee 8-20 (R. Hayton, Rapporteur), reproduced in ILA, Report of The Sixty-Second Conference Held at Seoul 1987 [herein after *Ground water Resources*]. For a broader discussion and the texts of international agreements in force concerning transboundary groundwater, see esp. International Groundwater Law (L. Teclaff and A. Utton, eds. New York: Oceana Pubs. 1981); Hayton, *The Law of International Aquifers*, 22. Nat. Res. J. 71 (1982); Utton, *The Development of International Groundwater Law*, 22, Nat. Res. J. 95 (1982).

[3] International Rivers (London 1967); also in International Law Association. Report of the Fifty-Second Conference Held at Helsinki 1966,484 (London 1967).

[4] *Groundwater Resources* supra note 4, at 21-43. The entire ILA record on international water resources has been collected and republished by the Finnish Branch of the ILA in one volume, including the commentaries and beginning with the Helsinki Rules. See The Work of the International Law Association on the Law of International Water Resources 257-97 (E. Manner &. V. Metsalampieds Helsinki 1988) for the work on the law of International Groundwater Resources.

[5] For a condensed review of the historical background of this topic in the United Nations (with references), see. e.g. 2 United Nations, Yearbook of the International Law Commission 68-71, (1985) (Part Two) (U.N. Doc. A/4O/10).

was meant by the term "international watercourse system".[1] In that Note of Understanding, "groundwater" was for the first time expressly listed as one of the "hydrographic components" of any watercourse system.[2] The International Law Commission continues its labor on the many articles in its tentative outline of the pertinent "residual" rules with broad accord that groundwaters are a part of the topic.[3]

It is, however, axiomatic that "residual" or customary rules are inherently less satisfactory than agreement between among the States concerned. There are a number of treaties that do include transfrontier groundwaters, but only in the broader context of all frontier waters or of the water resources in an international basin or system. With that in mind, the working group whose work is reflected in this version attempted to prepare a reasonable agreement responsive to the necessities facing two or more countries in their frontier areas with respect to their transboundary aquifers, their waters and concerns associated with those waters and aquifers. The final result follows after this introduction. The hope is that many States may find in this model useful "food for thought," if not express language applicable to their own situations.

At the United Nations Interregional Meeting of International River Organizations held in Dakar in 1981,

> The failure, with notable and noted exceptions, to recognize the interrelationships between surface waters and groundwater even where the system State agreements employ language that does not exclude groundwater was cited. Official awareness of the

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[1] Texts and narrative report in Yearbook of the International Law Commission of the United Nations 1980, vol. II (Part Two) 110-136. U.N. Doc. A/35/10.

[2] Id. at 108; reproduced in *inter alia*, Report of the International Law Commission on the Work, of Its Thirty-Ninth Session, 4 May-27 July 1987, 34, U.N. Doc. Supp. No. 10 (A/42/10). Final definition of the term "international watercourses" was, however, again deferred until a later stage ad of the work on the topic. Id. at 37.

[3] The Special Rapporteur for the topic presented his Fourth Report to the Commission during its 1988 Session with special emphasis on information and data exchange. (United Nations doc. A/-CN.4/412.) In that year the Commission, acting upon the report of its Drafing Committee, again leral reported a number of provisionally adopted articles to the United Nations General Assembly for ans- discussion in the Sixth (legal) Committee, as well as some provisional articles previously adopted. It should be remembered that the ILC's work deals with customary or residual rules (although the final version of these may be gathered into a draft "frame treaty") not with specific articles of e on agreement between "watercourse" or system States addressing a particular transboundary basin system. The articles thus far reported by the ILC cover *inter alia* scope agreements, equitable and reasonable utilization and participation relevant factors obligation not to cause appreciable harm, obligation to cooperate, exchange of data and information notification, and consultations and negotiations. Other articles are under consideration (Report of the International Law Commission 1988. United Nations pub. GAOR: 43d session, Supp. 10 (A/43/10) [New York, 1988], 45-139). The first paragraph of Article 10, "Regular exchange of data and information," in the context of the "General Obligation to cooperate" (Art. 9) requires the exchange "on a regular basis" of "reasonably available data and information on the condition of the watercourse [system], in particular that of a hydrological, meteorological, hydrogeological and ecological nature, as well as related forecasts." Id. at 106. Emphasis added.

> interaction of the "underground environment" with the surface (and the atmosphere) is only recently becoming widespread. Conjunctive use and protection of the shared groundwater resources and the shared surface-water resources in the same system will become imperative in many basins, as it has become in many internal basins, if the needs of our populations are to be met.[1]

Conclusion number 6 (under topic II, Progress in Cooperative Arrangements) of the Meeting reads:

> Those cooperating States that have not yet included groundwater as a part of the shared water resources system need to recognize this part of the hydrologic cycle as intimately linked to the quantity and quality of their shared surface waters, and could entrust their international river and lake organizations with the task to initiate technical studies and to call for hydrogeologic data. Concerned Governments may thus apprise themselves of the specifics of the interactions throughout the system, or portion thereof, with a view to benefiting from conjunctive use and to adopting the indicated conservation and protection measures for the underground environment.[2]

The Rapporteur on topic II reported to the Meeting:

> Management should include also the development, use and protection of shared groundwater resources in conjunction with surface waters. The relationship between surface and groundwater was not perceived by the negotiators until quite recently. There are treaties that consciously take a systems approach and, in addition, expressly include groundwater. Given the continued spread of contamination, ultimately the existence and importance of groundwater resources shared between two or more States, and their interconnection often with surface streams and lakes, will not be deniable, nor will it be possible to exclude shared underground waters from

[1] Experiences in the Development and Management of International River and Lake Basins, United Nations pub. (New York 1983), Natural Resources / Water Series No. 10, at 11.
[2] Id. at 14.

> efforts to achieve optimum utilization and the conservation and protection of freshwater resources…[1]

The latest discussion and formulation of these principles by a large group of responsible government officials and international experts was made in Addis Ababa in October 1988 at an Interregional Meeting. Some of the Meeting's conclusions merit quotation, for example on legal aspects:[2]

It is recommended that:

> 1. Governments recognize that the drainage basin provides the most useful context within which to achieve cooperation and agreement between or among the basin States for integrated development, including the application of legal principles governing an international water resources system and the inter-relationships between water, other natural resources and the peoples affected;
>
> 2. Governments recognize that the system approach to the management of a basin's water resources is the necessary point of departure for regulating and managing the resources, given the interdependence and diversity of the components of the hydrologic cycle-surface water, underground water, the water-atmosphere interface and the fresh water-marine interface;
>
> 3. Governments apply the general principles of international law applicable to the water resources, which include *inter alia* the right of each basin State to an equitable utilization and the duty not to cause appreciable harm to a co basin State (including to the environment), and recognize the duty to exchange available relevant information and data, the duty to notify and to consult reciprocally with co-basin States that may be adversely affected by a project or program planned by one or more basin States and the duty to consult concerning the institutionalization of co-operation or collaboration for basin development upon the request of any other basin State;*

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[1] Id. at 72 (by R. Haylon; footnotes omitted).

[2] United Nations Economic Commission for Africa and Department of Technical Cooperation for Development, Interregional Meeting on River and Lake Basin Development with Emphasis on the Africa Region, Addis Ababa, Ethiopia, 10-16 October 1988, Report of the Meeting, at 36-38 (first 8 of 11 recommendations). The Report was adopted unanimously.

*(During the plenary session, several participants expressed reservations on this recommendation and stated that, even where there is a moral obligation to exchange data or to consult reciprocally, this must proceed on the basis of agreement).

4. Governments realize that a basin State's right to an equitable share in the uses of the waters of an international drainage basin may be conditional upon that State's willingness, on a reciprocal basis, to participate infinitively in the reasonable measures and programs necessary to keep the system of waters in good order (equitable participation);

5. Governments appreciate that general international water resources law principles are applicable in the interpretation of agreements between or among basin States, as well as where no binding agreement has yet been reached.

6. Basin States enter into suitable agreements which spell out precise rules regarding rights and obligations of the parties for the optimum use of the water resources for implementation of any programs to be undertaken, and that such agreements include precise rules on the ownership of waterworks and facilities, the exercise of jurisdictional powers, and the financing and allocation of costs and benefits, as well as the exchange of information.

7. Governments recognize that basin organizations are important and influential prime movers in the development process, and that Governments accord due importance to them and to enabling legislation which should provide for high calibre personnel in both the policymaking and the technical bodies;

8. Governments adopt, in fashioning legal arrangements and institutions for cooperation in the development, conservation and use of shared river basins, a flexible approach and (a) identify realistic objectives taking all constraints into account, (b) tailor institutions to respond to the agreed objectives', and (c) monitor the progress of achievements and the performance of institutions and make the adjustments needed to reflect significant changes in the circumstances; …

And, selected from the Meeting's conclusions on the other aspects:[1]

On resource assessment and planning aspects:

The meeting recommended that national governments and, where C. TI applicable, river basin organizations ....

1. Prepare national comprehensive, standardized inventories of basin data (physical and biological resources, demographic, social and economic, including production and marketing systems, etc.) as specified and required by and from all sectors and parties concerned…

2. Develop and implement systems and institutional arrangements for the collection and storage of data relevant to river and lake basin projects, providing for and stimulating information exchange and access to data among concerned parties, for the better planning and management of basin resources…

…….

3. From the initial stages of resource assessment and planning, and throughout all planning and implementation processes, arrangements must be made to ensure the active participation of local institutions representing involved and affected populations.

On constraints and environmental aspects, it was recommended that:

1. Governments should delegate adequate power and resources to river and lake basin development authorities so as to act in the best interest of comprehensive planning, coordination, and management for basin development.

2. Governments should widen the process of defining national goals and of establishing criteria that take into account resident populations of basins as beneficiaries and include sustainable environmental aims to improve human welfare and health.

Finally, on new approaches for sustainable growth and socio-economic development in Africa,

a) The mandates and the scope of work entrusted to river basin organizations may be too restrictive to permit their timely, effective and flexible functioning.

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[1] Id. at 35,36.39.41-42. More generally see Development in Cooperative Action Concerning Shared Water Resources, United Nations doc. ECA/NRD/IMRLBD/3. Aug. 1988 (by R. Hayton becau for the same Meeting).

> b) Institutional instruments and arrangements available to river basin organizations have proved inadequate.
> …..
> g) There has been unnecessary overlapping and lack of harmonization between the work of river basin organizations and that of various subregional organizations engaged in the planning and implementation of joint development programs and projects.
> h) Local participation has been inadequate at all stages of project conception, planning and implementation…

C. The Increasingly Critical Nature of the Pressure on Groundwater

Especially in arid regions of the world, crisis situations are arising because of over pumping or contamination of aquifers many of which are crossed by international boundaries. The rapid growth of human settlements and economic activities in many border areas has brought with it alarming increases in the demand for water, not only for drinking and other domestic uses, but for the expanding industrial, agricultural and municipal uses. More and more it is not possible to satisfy these needs from scarce or polluted surface waters; the exploitation of groundwater and the preservation of its quality have often become the single most pressing concern of border communities.[1]

Israel, for example, relies upon groundwater for more than two-thirds of all the water used in the country; more than three-fourths of the public water supply in Denmark, the Federal Republic of Germany and the Netherlands is from underground sources. In Tunisia and Belgium, nine out of ten persons are dependent upon groundwater, and the aquifers serving many cities are rapidly being depleted because withdrawals exceed recharge. The Center for Strategic and International Studies in Washington, D.C. concluded, after a fifteen-month study, that almost all of the water in the river systems of the Middle East is already being used, including the Nile, Jordan and Tigris-Euphrates Rivers: severe shortages will occur, combined with a deterioration in water quality, particularly in Egypt, Jordan, Israel, the West Bank, the Gaza Strip, Syria and Iraq, if "present consumption patterns continue". Solutions are difficult, because political problems have masked the situation. Many "projects that could alleviate the situation cannot be carried out because of enmities, " since river systems cross national boundaries.[2]. Though the "visible" crisis is, as usual, spelled out in surface water terms, the pressures on those rivers' interconnected aquifers, and on transfrontier aquifers not

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[1] Overa ll population growth is regarded as the single most salient factor affecting both water supply and quality. See L. Brown By Bread Alone 35 (1974); World Population Prospects, 1965-2000. As Assessed In 1968. U.N. Doc. RSA/P/WR (1968).

[2] As reported in U.S. Water News. April. 1988. at 20.

significantly related to surface supplies, are often as great if not greater than on the streams and lakes.

Similarly, the occurrences of droughts and floods are traditionally seen as disasters affecting or caused by surface waters, without recognition of the roles of groundwater, for example, in mitigating drought conditions or in the loss of potable well water as the result of infiltration of contaminated flood waters. Among water supply administrators the interaction is well known, and more recently other authorities and the general public have become more aware of the crucial nature and vulnerability of their underground supplies. But rational management of the water resources available in a region requires the formulation and implementation of water policies calculated to control abstractions in quantitative terms and to protect or improve, where appropriate and practical, the quality of the waters. In view of the high vulnerability of groundwater to long lasting (if not permanent) pollution including increasingly from highly toxic wastes or contamination from salt water intrusion special policies and programs must be provided for our precious groundwaters. Moreover aquifer recharge is often very slow or diminished severely by improper land use activities. The resource is finite if in principle usually renewable. Destruction ɗ groundwaters suitability for human consumption or industrial or agricultural applications can readily be and in some cases already has become. for a1l practical purposes irreversible.[1]

In 1987 the European Economic Commission (ECE) of the Unite Nations adopted Principles Regarding Cooperation in the Field of Transboundary Waters in which, *inter alia*, the Commission expressed its awareness

> that prevention and control of transboundary po1lution in rivers and lakes… and in related groundwater aquifers as well as prevention and control of floods are important and urgent tasks whose effective accomplishment can only be ensured by enhanced cooperation among riparian countries.[2]

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[1] See Hayton. The Groundwater Legal Regime as instrument of Policy Objectives and Management Requirements. Annales Juris Aquarum II 344. reproduced in International Groundwater Law, supra note 4, at 57. For further exposition on the importance of sound groundwater management to plus reviews of international and federal country practice and detailed statements of the issues and concepts dealt with by the working group, see introduction and Preface to, Rogers & Utton, supra note 1, at 716-26.

[2] Resolution I (42), United Nations doc. E/ECE/(42)/L.19, 30 April 1987, at 13.

The ECE went on to declare that transboundary waters "do not lend themselves to purely national approaches because natural phenomena and human activities… may make themselves felt across borders and require cooperation….[1]

Tensions are building. Apparently unilaterally, Libya is constructing a "Great Manmade River" a costly twelve-hundred-mile pipeline from the Kufra Oasis in the southeastern part of the country to its Mediterranean coastal area where most of Libya's population lives. Nearly half a mi1lion arid acres can thus be irrigated; however the aquifer to be tapped reportedly underlies neighboring Chad. Sudan and Egypt. Lowering of the water table in the region including other interconnected aquifers in the Nile basin is feared.[2] These are possible ramifications of such schemes.

The resulting challenge is for experienced experts of good will to fashion legal and administrative machinery that would enable the parties is concerned to bring about effective management, given the fact that the resource at risk lies in geological structures that straddle international borders or feed, or are fed by, international rivers and lakes. It is to be hoped that such efforts will provide the basis for new understandings by the political leaders involved, in order that they may over time face up to the physical, chemical, biological, economic and societal realities before it is too late.[3]

II. THE DRAFT AGREEMENT WITH COMMENTARIES

AGREEMENT CONCERNING THE USE OF TRANSBOUNDARY GROUNDWATERS

The High Contracting Parties,…….. and…… ,

Motivated by the spirit of cordiality and cooperation which characterizes the relations between them;

Desirous of expanding the scope of their concerted actions with respect to the problems confronting their Peoples along their common frontier;

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[1] Principle I (a), id. at 15. Other Principles delve in some detail into recommended terms of agreements, water quality objectives and criteria, institutional arrangements, quality objectives and criteria, functions of institutional bodies, pollution, monitoring and data processing, warning and alarm systems, etc. ld. at 15-21.

[2] As reported in U.S. Water News, Jan., 1986.

[3] For additional scholarly and intergovernmental background, see esp.. Barberis. Le regime juridique international des eaux souterraines. 33 Annuaire Francaise De Droit Intemational 130 (1987); J. Barberis, EI Regimen De Las Aguas Subterraneas Segun EI Derecho International, United Nations Food and Agriculture Organization Legislative Study 40 (Rome 1986); Utton, International Groundwater Management: The Case of the U.S.-Mexican Frontier. 57 Nebraska Law Rev. 633 (1978); Ground-water Legislation in the ECE Region, United Nations Economic Commission for Europe (ECE. doc. ECE/Water/44. New York, 1986); ECE. Committee on Water Problems, Report of the Eighteenth Session, ECE/Water/47 (2 Mar. 1987); L. Teclaff, Water Law in Historical Perspective (WilIiam S. Hein Co., Buffalo. 1985).

Recognizing the critical importance of their transboundary water resources and the need to enhance the rational use and conservation of the said resources on a long-term basis;
Noting especially the present unsatisfactory state of protection and control of their transboundary groundwaters as well as the prospects of crisis conditions in some areas because of increasing demands upon, and the decreasing quality of, those groundwaters;
Seeking to provide for the utilization, protection and control of those groundwaters on an equitable basis and, to that end, for the creation and maintenance of an adequate data base;
Recognizing that the optimum and efficient use of their transboundary water resources is essential to the interests of both Parties;
Resolving to protect the quality of the transboundary groundwaters for present and future generations;
Wishing to resolve amicably any differences that may arise in connection with the use, protection or control of the said transboundary groundwaters and, for that purpose, to utilize a joint agency, and
Concluding that the best means to achieve the rational management of their transboundary water resources and the protection of the under ground environment is to adopt in principle, an integrated approach including, where appropriate, the conjunctive use of surface water and up groundwater in their border region,
Have agreed as follows:

COMMENT:

1. The Draft presumes a common interest of all Parties in coming to an agreement concerning groundwater, but does not assume that all interests in relation to the border region are common. Differences between the Parties are to be expected, derived from, for example, their different stages of development, financial and institutional capabilities, need for more or better water, use priorities or environmental concerns. Thes aspect differences need to be respected and reconciled, unless they can be altier; leviated or modified through cooperation or collaboration under the agreement or otherwise.
2. The preamble, which by definition contains no operative provisions, if the purports to declare the Parties' agreed upon principles and policies with respect to groundwater of common concern, and recognition of the interrelationships between water resources on the surface and those underground. Of course, the preamble could be expanded to express additional the concerns, or reduced to reflect narrower overall objectives.
3. Both water quality and water supply, interdependent in any event, receive express attention; the use of the phrase "underground environment" imports

above all, a concern for the water bearing formation (aquifer) as well as for the water stored in and flowing through it.

4. Widely accepted general terms are employed at the outset (e.g., "rational management" and "on an equitable basis"), leaving to the substantive articles, including the Definitions article, the establishment of the Agreement's precise words and phrases of art. The means for actually accomplishing the Parties' objectives-such as general duties of the Parties, augmentation (or creation) of the powers and functions of their commission, data base and monitoring programs, and special powers under carefully specified conditions - are left to the operative provisions.

ARTICLE I
DEFINITIONS

As use in this agreement:

1. “Aquifer” means a subsurface water bearing geologic formation from which significant quantities of water may be extracted.
2. “Border region” means the area within approximately kilometers from each side of the mutual boundary as set forth on the annexed map.
3. “The Commission” means the agency designated in Article III, para 1, of this Agreement.
4. “Conjunctive Use” means the integrated development and management of surface and groundwater as a total water supply system.
5. “Contaminant” means any substance, species or energy which detrimentally affects directly, indirectly, cumulatively or in combination with other substances, human health or safety or agricultural or industrial products or processes, or flora, fauna or an ecosystem.
6. “Contamination” means any detrimental chemical, physical, biological, or temperature change in the content or characteristics of a body of water.
7. “Depletion” means the withdrawal of water from an aquifer at a rate faster than it is recharged, otherwise known as “mining” the water.
8. “Drought” means a condition of abnormal water scarcity in a specific area resulting from natural conditions.
9. “Drought Alert” means the declared condition provided for in Article XII.
10. “Drought Emergency” means the declared emergency provided for in Article XII.
11. “Drought Management Plan” means the plan provided for pursuant to Article XII.
12. “Environmental sensitivity" means vulnerability or susceptibility to changes detrimentally affecting the quality of life or one or more biological or physical systems.
13. “Government(s)" means the governments of the Parties to this Agreement.
14. “Groundwater” means the water in aquifers.

15. “Impairment” means any physical change in an aquifer or its recharge area, which significantly reduces or restricts the potential for use of the waters of the aquifer.
16. “Interrelated surface water” means those surface waters in the territory of either Party, the quantity or quality of which is affected by the out flows from, or the inflows to, transboundary groundwater.
17. “Pollution” means the introduction of any contaminant by man, directly or indirectly, into groundwaters or surface waters.
18. “Public Health Emergency” means the declared emergency provided for in Article IX.
19. “Recharge” means the addition of water to an aquifer by infiltration of precipitation through the soil or of water from surface streams, lakes, or reservoirs, by discharges of water to the land surface, or by injection of water into the aquifer through wells.
20. “Transboundary aquifer" means an aquifer intersected by a common boundary.
21. “Transboundary Groundwater Conservation Area” means an area declared by the Commission pursuant to Article VII.
22. “Transboundary groundwaters” means waters in transboundary aquifers.

COMMENT:

1. The definitions in this Article are terms and phrases of art as they are to be employed in the implementation and interpretation of this Agreement. These definitions are applicable in a variety of geographical settings. To avoid possible confusion because of differences in the meaning of terms as used by various disciplines or as between countries, a coherent set of definitions is here provided, grounded in the pertinent, accepted technical and administrative vocabularies.

2. “Aquifer” denotes water-saturated zones below the earth's surface, excluding the water in, e.g., the soil zone, in lakes and streams, or trapped in “unyielding" rock, clay, etc. A degree of transmissivity within the structure (sand, gravel, chalk, stone, etc.) is required; an aquifer typically has “boundaries," vertical and horizontal, termed aquacludes and aquatards. A similar definition is contained in the ILA's Seoul Rules: The term “aquifer” as here employed comprehends all underground water-bearing strata capable of yielding water on a practicable basis, whether these are in other instruments or contexts called by another name such as ‘groundwater reservoir’, ‘groundwater catchment area,’ etc. including the waters in fissured or fractured rock formations and the structures containing deep, so-called ‘fossil waters.’[1]

3. The term “conjunctive use” arises because the hydrologic interrelationships between ground and surface waters make it essential to consider the impact of the use of one on the other. The ECE Report on groundwater

[1] Art I. The Waters of International Aquifers, Rules on International Groundwater, Groundwater Resources supra note 4, at 21.

legislation indicated that "the interrelationships between surface and groundwaters are various, frequently pervasive and of great practical significance..."[1] The Report also observes that:

> The varieties of hydrological situations involving groundwater are many and complex. They include interactions between groundwater and surface waters, between groundwater and other natural resources, and between groundwater and other elements of the environment. Generally groundwaters are interconnected with overlying surface waters (streams, lakes, or seas).[2]

Moreover, the availability of surface water or of groundwater, as well as the quality of each, varies significantly from place to place. Therefore, because of considerations of suitability and yield, optimum utilization in a water-scarce area can often be achieved only by combining and managing the resource in its entirety, rather than as separate sources of supply. As the ECE Report concludes:

joint management of ground and surface water resources holds the promise for better distribution of water and greater efficiency in useless waste or loss of water in transit from the source... to the user, and less need for storage and distribution and, hence, lower capital investment.[3]

5. Attention is invited to the distinction made in the definitions between "contamination" and "pollution." Whereas "pollution" involves human intervention, "contamination " is broader to encompass, in addition, changes resulting from any agent. Extra-human agents could include earthquakes, volcanic eruptions and natural floods, for example. This distinction between all detrimental changes (contamination) and only those which are caused by humans or their activities (pollution) is not new, though it has often been lost by imprecision; translation into certain other languages, where the two English words (pollution and contamination) are represented by only one word may present a problem. These definitions have been refined from the numerous definitions found in the literature and official documents, particularly the definition employed in the Third Report of S. Schwebel to the U .N. International Law Commission (ILC), the definition employed by the Institut de Droit International in its Resolution on Pollution of Rivers

[1] Groundwater Legislation in the ECE Region, *supra* note 22, at 10.

[2] *Id*.

[3] Id. at 11. See also, Seminar on Conjunctive Use of Surface and Groundwater Resources, Pre-Seminar Volume, Papers, S. Sharma, compiler, for Central Groundwater Board, Indian Ministry of Water Resources (New Delhi, 1986).

and Lakes, and the definition employed by the ILA in its Montreal Rules on Pollution of international water resources.[1] Judge Schwebel's definition (embracing international groundwater) reads: "...'pollution' means any introduction by man, directly at or indirectly, of substances, species or energy into the waters of an international watercourse system which results in effects detrimental to human health or safety, to the use of the waters for any beneficial purpose, or to the conservation or protection of the environment."[2]

Illustrative of the potential for a species being a contaminant is the U.S.-Canada controversy over the proposed Garrison Dam. It was proposed to divert water from the Missouri River Basin to irrigate lands lying within North Dakota and within the Hudson Bay Drainage Basin. This large interbasin transfer of water would have resulted in substantial return flows from the irrigated acreage in North Dakota discharging into rivers entering the Canadian Province of Manitoba. The risk of interbasin and in this case international biota transfer was a serious concern. The biota in this instance could be a "contaminant," which would constitute "pollution" since its introduction into Canadian waters would be due to man's activities.[3]

5. The definition of "contaminant," then, identifies the specific polluting or contaminating "ingredient", whether it be, for example, a metal, a chemical, a biological species (including water-borne disease), or change in temperature, provided that the "ingredient", alone, in concentration or combined with another "ingredient", is deleterious as described.

6. With respect to aquifer "impairment," the ILA's Seoul Rules provide, under the heading "Protection of Groundwater":

> 2. Basin States shall consult and exchange relevant available information and data at the request of any one of them
>
> a) for the purpose of preserving the groundwaters of the basin from degradation and protecting from impairment the geologic structure of the aquifer, including recharge areas;
>
> b) for the purpose of considering joint or parallel quality standards and environmental protection measures applicable to international groundwaters and their aquifers.
>
> 3. Basin States shall cooperate, at the request of any one of them for the purpose of collecting and analyzing additional

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[1] For these, and several others of significance, and a discussion of their merits, see International Law Commission, Third Report on the Law of the Non-Navigational Uses of International Water-courses (S. Schwebel. Special Rapporteur, with the assistance of R. Hayton). U.N. Doc. A/CN.4/348 11 Dec. 1981, at 157-236 ("Environmental protection and po1lution"), esp. 177 , 220, 223-29, reproduced in ILC, Yearbook ...1982, Vol. II. Part One [hereinafter ILC Third Report]

[2] Id. at 220 (proposed Art.10, para.1).

[3] See Caldwell, Garrison Diversion: Constraints on Conflict Resolution, 24 Nat. Res. J. 839-41, 853-57 (1984).

needed information and data pertinent to the international groundwaters or their aquifers.

7. The ILA's Seoul Rules go further than does this Agreement's definition of "interrelated surface waters" and spell out relevant and important factual interrelationships under the rubric of "Hydraulic Interdependence":

> 1. An aquifer that contributes water to, or receives water from surface waters of an international basin constitutes part of that international basin for purposes of the Helsinki Rules.
> 2. An aquifer intersected by the boundary between two or more States that does not contribute water to, or receive water from, surface waters of an international drainage basin constitutes an international drainage basin for the purposes of the Helsinki Rules.
> 3. Basin States, in exercising their rights and performing their duties under international law, shall take into account any interdependence of the groundwater and other waters, including any interconnections between aquifers, and any leaching into aquifers caused by activities in areas under their jurisdiction.[1]

8. The definition of "transboundary groundwaters" and of "transboundary aquifer" is similar to that adopted in Seoul in 1986 by ILA "The waters of an aquifer that is intersected by the boundary between two or more States are international groundwaters and such an aquifer with its waters forms an international basin or part thereof. Those State are basin States within the meaning of the Helsinki Rules whether or no the aquifer and its waters form with surface waters part of a hydraulic system flowing into a common terminus". [2]

9. The other definitions in this Article are deemed well established or self explanatory. Additional commentary will be found under the articles where each matter is dealt with substantively; the extensive commentary under the articles in the "Ixtapa Draft" may also prove useful. [3]

ARTICLE II
GENERAL PURPOSES

1. The Parties recognize their common interest and responsibility i1í ensuring the reasonable and equitable development and management of groundwaters in the border region for the well being of their peoples.

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[1] Art. 2, Id. at 29 and see supporting comment thereunder, at 29-37.
[2] Art. 1., Id. at 21 and see supporting comment thereunder, at. 21-28.
[3] See Rogers & Utton, supra note 1, at 730-72.

2. Accordingly the Parties have entered into this Agreement in order to attain the optimum utilization and conservation of transboundary groundwaters and to protect the underground environment. It is also the purpose of the Parties to develop and maintain reliable data any information concerning transboundary aquifers and their waters in order to use and protect these waters in a rational and informed manner.

COMMENT:

1. This Article expresses the reasons why governments negotiate with each other with respect to the use, protection and control of transboundary resources, in this case, international aquifers and their waters. A need for concerted action has arisen. It is expected that the type of agreement here presented is part of an ongoing process, with important historical antecedents but looking to the future, for the purpose of attaining a satisfactory degree of rational management of the resource by means of the basic principles, corresponding duties and institutional machinery adopted in this "landmark" agreement. If an adequate legal framework and competent institutional arrangements were already in place between the Parties for the attainment of this goal, this agreement presumably would not be necessary.

2. The objectives of "optimum utilization and conservation" are agreed to be on a "reasonable and equitable" basis with protection of the "underground environment, " in which the saturated geological structures are situated.

3. The term "underground environment" is intentionally used rather than a more restrictive phrase, such as "underground water environment". The more comprehensive term was chosen in order to include not only the quality and quantity of the waters, but, *inter alia*, the geologic structure of the water body, the aquifer itself. The aquifer can be damaged, not only permanently impairing extraction but causing widespread subsidence. Moreover, groundwater's action and content can affect other resources underground, soil organisms and the roots of plants; minerals and organics naturally (or under the influence of pollution) dissolve into or mix with the waters, or combine into injurious compounds. Mining and petroleum exploration and exploitation, also in the "underground environment", can seriously harm the aquifers and pollute or waste their waters [1]. These multiple actions and interactions, though water related, have impacts far beyond the groundwater per se.

4. The emphasis on the development and maintenance of "reliable data and information" articulates a universal need, without which rational for management of aquifers at any level is not possible.

5. In those border regions where the traditional rights of nomadic or in tribal peoples to groundwater are still fundamental to their way of life, the Parties may choose to add a third paragraph to the text of this Article, making protection of such traditional rights, insofar as practical, an express purpose of the Agreement.

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[1]Century of Oil Dril1ing Affects Oklahoma Groundwater," U.S. Water News, June,1988, at 3, referring to a series of Reports by the U.S. Geological Survey.

ARTICLE III
THE COMMISSION RESPONSIBLE UNDER THIS AGREEMENT

1. The Commission is designated as the Parties agency to carry out the functions and responsibilities provided for by this Agreement.

2. The Commission shall be authorized a technical staff, which. in collaboration with the technical staffs of the Governments shall assist the Commission in the accomplishment of its functions and responsibilities.

3. The Commission is authorized to declare Transboundary Groundwater Conservation Areas, Drought Alerts, Drought Emergencies and Public Health Emergencies and to promulgate the corresponding plans and Depletion Plans, in accordance with the provisions of this Agreement.

4. The Commission shall have jurisdiction over such additional matters concerning the border region as are from time to time referred to it by the Governments jointly.

5. The Commission shall prepare and propose to the Governments a budget conforming insofar as practicable to the budget cycles and procedures of the Governments, covering the projected expenses and capital costs of the Commission's joint operations plant and staff. The total amount of each budget shall be divided between the Governments in the proportions agreed upon by the Commission and approved by the Governments.

6. The budget for the separate operating costs of each national section shall be the responsibility of the respective Government.

7. The Governments may jointly refer a specific matter relating to transboundary groundwater to the Commission for investigation or action. Individually Governments may request the Commission advice relating to transboundary groundwaters on matters originating within the requesting Government portion of the border region.

8. The Commission shall cause each such referral and request to be taken up and investigated studied or acted upon as appropriate. The Commission shall render a report to the Governments on every referral and request taken up.

COMMENT:

1. This Article contemplates that the Parties may already have a joint international institution whose powers and functions may readily be expanded to deal with the added responsibilities of transnational groundwater. If no such institution is in place, or the Parties choose to create a separate commission or agency, the name to be given the new entity is, similarly, to be inserted in

Paragraph 1. In the case of the United States and Mexico, it is likely that the Parties would choose to designate their existing International Boundary and Water Commission, with which the Governments have a long and satisfactory experience.

2. Separate agencies for surface waters and for groundwaters were not recommended by the working group, since conjunctive management of the two types of sources would then be more difficult to achieve. Moreover, additional costs would be incurred as a result of the partial duplication of staff, facilities and equipment; coordination of border region activities would be more complicated. Attention to the tasks and problems presented by serious efforts to manage international groundwaters will nonetheless require considerable added capability, including the capability to coordinate and monitor the actions of the various national agencies involved in each country (Paragraph 2).

3. In the case of the United States and Mexico, the Governments have it established (in addition to their respected International Boundary and Water Commission, the IBWC) a broader umbrella institution for dealing a with transboundary environmental issues. The 1983 Border Environmental Cooperation Agreement, signed at La Paz, Baja California Sur, created a bilateral administrative mechanism to deal with a broad range of environmental issues through designated "National Coordinators". The coordinators are the respective national environmental agencies. They are charged with monitoring the implementation of environmental agreements, and make annual reports to the Governments on their activities. The National Coordinators, at their first meeting in 1984, established three binational working groups respectively addressing water, air and toxic hazards. The IBWC works closely with the National Coordinators on matters involving water quality. Under the La Paz Agreement, additional "annex" agreements on specific issues, including air quality, toxic wastes and sewage spillage, have already been concluded. [1] This relationship between the "water" Commission and the institution dealing with the broad range of environmental issues allows the IBWC to continue its primary focus on water management. Thus, it is not "stretched too thin " by having to deal with an overly broad variety of issues which could weaken its prestige and acceptability and thereby its effectiveness. [2]

4. Paragraph 3 establishes in principle the Commission' s power to deal with special and emergency situations, the procedures for which are spelled out in subsequent articles. And the Agreement contemplates the Governments, acting together, may wish to delegate to the Commission additional functions, which provides flexibility as unanticipated or a worsening conditions might require, and as the Parties gain confidence in their joint institution (Paragraphs 4 and 7).

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[1] Reproduced in 26 Legal Materials 16-37 (No.1 Jan. 1987); see also Mumme, La Paz Agreement: Progress and Problems in Managing the Border Environment., 2 Transboundary Res. Rep. 1 (1988).

[2] See Scott, The Canadian-American Problem of Acid Rain. 26 Nat. Res. J. 336, 349 (1986).

5. Typically, *a joint* agency is made up of national sections, each of which requires funding from within its own government to cover its internal office, staff, printing, travel and other administrative expenses (Paragraph 6). The Article distinguishes, thus, between the expenses of each nation's section of the Commission, and the joint expenses of the Commission as a whole. This is the case of the International Boundary and Water Commission, based on the distinction found in Article 2 of 1 the 1944 Treaty between the United States and Mexico which constituted that Commission.[1]

6. Under the Agreement the Commission is expected and directed to take the initiative with regard to a number of transboundary groundwater issues. In Paragraph 7 of this Article, the Governments themselves, in concert or singly, may impose special tasks upon the Commission. A joint "tasking", that is, where the Governments of all the Parties want the matter looked into or action taken or both, is here termed a "referral," grounded in principle on the practice of the International Joint Commission (IJC) that has evolved between Canada and the United States. The Commission might, in the usual case, then be specifically authorized to perform somewhat beyond its original terms of reference, for the specific purpose of satisfying the Governments' referral.

7. If only one Government (or less than the total number) wishes the analysis, opinion or counsel of the joint agency on a pertinent subject, a "request" can be addressed to the Commission. Requests could be for assessment of the transboundary impact of a project planned in the requesting State's territory, for example, requiring development and analysis of data from both sides of the border. The question whether a use on the requesting Government's side of the border is within its "equitable utilization" of the waters could be another inquiry.

8. Quite deliberately that authority unilaterally to require the Commission to respond is restricted. The problem or question must have its origin within the requestor's part of the defined border region. Issues brought about by, for example, pollution or diversion, or the threat thereof, on the other side of the border do not qualify under this provision; a joint referral would be called for. It is regarded as critical that one Government not cause political embarrassment, intentionally or otherwise, to another Government by placing matters of delicacy in the lap of the Commission absent an agreement to refer, including with respect to the precise terms and limitations thereto. Thus, it is intended that bilaterally controversial "requests" be precluded. Each Government if it chooses should have the ability, nevertheless, to seek the assistance of the joint agency on questions of fact and of law where groundwater related activities in that Government's area of responsibility under the Agreement have or may have transboundary effects .

ARTICLE IV

[1] Treaty Respecting Utilization of Water of the Colorado and Tijuana Rivers and of the Rio a Grande, Feb. 3. 1944, 59 Stat. 1291, 3 U.N. T.S. 314 (effective Nov. 8, 1945).

ENFORCEMENT AND OVERSIGHT RESPONSIBILITIES

1. The enforcement of water quality and quantity measures and related land use controls within the territory of each Party shall be the responsibility of that Party or of its political subdivisions as appropriate.

2. The Commission shall biennially conduct a review of the water quality and quantity control measures taken within each Party' s territory affecting the border region and shall issue a Report containing its assessment of the adequacy and effectiveness of programs for the protection and improvement of the transboundary aquifers and their waters and withdrawal and land use controls including with respect to any Transboundary Groundwater Conservation Areas, Depletion Plans, Drought Emergency Plans and Health Emergencies. To that end each Government shall furnish the Commission with the relevant data, information and studies for use by the Commission in preparing its Report. in accordance with the reporting formats provided by the Commission.

3. In addition to facilitating as needed the Commission's oversight responsibilities under paragraph 2, each Government shall make a biennial Report to the Commission specifying the water quality and conservation measures taken; quantities withdrawn transferred and exchanged and any problems encountered in carrying out the provisions of this Agreement or in implementation of any of the conservation depletion and drought management plans and health emergency measures adopted.

COMMENT:

1. The designated international commission is not designed as an enforcement agency. Each government will see to the carrying out of the obligations arising under the Agreement. But the Commission will sit as reviewing entity on behalf of the Parties, as provided in Paragraph 2.

2. In turn the Governments are obliged to famish the Commission with the "raw material" it needs to make its review and evaluation. Each Government will, moreover, render its own report to the Commission showing the actions taken in the territory of each and indicating any difficulties encountered or deficiencies experienced in carrying out the agreed programs (Paragraphs 2 and 3). The intended result is meaningful support by the national agencies of the joint agency's mission, and by the Commission of the Governments' tasks, reciprocally. The critical nature of the Agreement's objectives warrant such continual interaction.

ARTICLE V
ESTABLISHMENT AND MAINTENANCE OF THE DATABASE

1. The Commission is charged with the creation and maintenance of a comprehensive and unified database pertaining to transboundary groundwaters, in the languages of the Parties. The database shall include an inventory of all

transboundary groundwater resources taking into account quantity, quality, aquifer geometry, recharge rates, interaction with surface waters, and other pertinent data and shall identify all transboundary aquifers.

2. The Commission shall carry out studies directly, or through research programs conducted by or with other bodies, public or private:

a. to identify inadequacies in available data and to propose remedial action;

b. to examine present and potential future uses of said groundwaters , taking into account demographic projections and socio-economic development plans ;

c. to assess the impact of present and potential development on trans-boundary groundwaters and related resources;

d. to study possible alternative sources of surface water and groundwater for use in the border region, taking into account the quantity and quality of the waters and the potential for the conjunctive use of the available waters; and

e. to examine the potential for, and the consequences of, drought, floods, and contamination in the border region.

3. The Parties undertake to facilitate the acquisition of information and data by the Commission on a timely basis in accordance with the Commission' s requirements.

4. The Commission shall compile, analyze, and disseminate the data, information and studies and provide the results to the Governments.

COMMENT:

1. There can hardly be anything more important in effecting international water resources management than the factual basis required for each rational decision making. Consequently, the critical need recognized in the General Purposes Article (II, Paragraph 2) is here made not only more any specific, but a unified, comprehensive data base is mandated. The provision is cast in fairly broad terms, allowing the Commission to detail the date collection and analysis schemes, as required under present circumstances and foreseeable needs (Paragraph 1).

2. A charge to carry out research is made quite specific. The Commission in most cases would probably delegate the study assignments to cooperating national agencies, or would contract with competent private, autonomous entities such as universities, technical institutes and consultant firms (Paragraph 2).

3. The Parties are bound to assist the Commission in these endeavors without undue delay. The Commission is required to disseminate the analyzed results of its research programs to the governments (Paragraph 4); further dissemination would be a matter for the Governments to decide.

4. Respect for the Commission will be rooted, in the first instance, in its thorough understanding of the circumstances of each problem. Only in this way can it achieve impartiality in assessing the information and data it compiles. Data has to be delivered to the Commission according to an agreed design providing

uniformity and compatibility, in order that the composite data base may be created. The Commission will be in a position to identify gaps and imbalances in existing data and prescribe the corrective collection efforts. Standards for and classifications of aquifers not to mention remedial and protective measures can only be arrived at on the basis of accurate, up-to-date, reasonably sufficient data.
The U.S.-Canada International Joint Commission (IJC) has gained respect over the years because of its "well deserved reputation for objectivity, for basing decisions and recommendations on sound scientific and technical data."[1]

5. The essential nature of the data base is now universally acknowledged.[2] At the United Nations Water Conference, these conclusions and recommendations, *inter alia*, were adopted:

1. In most countries t ere are serious inadequacies in the availability of data on water resources, particularly in relation to ground - I and water and water quality. Hitherto, relatively little importance has been attached to its systematic measurement. The processing and compilation of data have also been seriously neglected.
2. TO IMPROVE THE MANAGEMENT OF WATER RESOURCES, GREATER KNOWLEDGE ABOUT THEIR QUANTITY AND QUALITY IS NEEDED. REGULAR AND SYSTEMATIC COLLECTION OF HYDROMETEOROLOGICAL, HYDROLOGICAL AND HYDROGEOLOGICAL DATA NEEDS TO BE PROMOTED AND BE ACCOMPANIED BY A SYSTEM FOR PROCESSING QUANTITATIVE AND QUALITATIVE INFORMATION FOR VARIOUS TYPES OF WATER BODIES. THE DATA SHOULD BE USED TO ESTIMATE AVAILABLE PRECIPITATION, SURFACE-WATER AND GROUND-WATER RESOURCES AND THE POTENTIALS FOR AUGMENTING THESE RESOURCES…
3. To this end it is recommended that countries should:
….
(c) Establish observation networks and strengthen existing systems and facilities for measurements and recording fluctuations in groundwater quality and level; organize the collection of all existing data on ground water (borehole logs, geological structure, and hydrogeological characteristics, etc.); systematically index such data, and attempt a quantitative assessment so as to determine the present status of and gaps in knowledge; increase the search for, and determination of, the variables of aquifers, with an evaluation of their potential and the possibilities of recharge;

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[1] Sadler. The Management of Canada-U.S. Boundary Waters: Retrospect and Prospect. 26 Nat. Res. J. 359. 370 (1986).
[2] See. e.g., ILC Third Report. supra note 27, Comment to Art. I, esp. at 124-56 and documents for and works there cited.

(d) Standardize and organize as far as possible the processing and publication of data so as to keep the statistics up to date and take advantage of the observations made in stations operated by different institutions;
(e) Include considerations of disease associated with water as an integral part of water assessments and the consideration of the interrelationships of water quality, quantity and related land use;
(f) Make periodic assessments of surface and groundwater resources…;
…
(h) Standardize measurement techniques and instruments;
(i) Support and promote national contributions to regional and international programmer on hydrological studies;
….
(o) Provide for the studying and analyzing of hydrological data on surface and groundwater by multidisciplinary teams so as to make adequate information available for planning purposes; …[1]

6. The elaborate Action Plan for the Zambezi River Basin (ZAC-PLAN), developed by the United Nations Environment Program (UNEP) in cooperation with the system States, places the strongest emphasis on the collection and analysis of reliable and suitable data, including, *inter alia*, differential demography, disease, sanitation, land tenure, water uses and requirements, reserves (parks, etc.) and national institutions.[2] Much of the data presently available on the characteristics of the Basin were judged to a great degree unacceptable for hydrological analysis.[3] The lack of a comprehensive inventory of water resources creates problems in water resources management. This situation should be rectified… The creation of data banks will be an important tool for water resources management…"[4] The hydrological data should relate to both surface and groundwater, ...and to water quality in general including chemical and biological parameters"[5] The need was expressed for a uniform or at least compatible system of data collection and storage," the identification of national data centers, and a-regional data center (potential).[6]

ARTICLE VI

[1] Report of the United Nations Water Conference, U.N. Doc. Sales No. E. 77. II. A. 12.7-9 (1977). Capilalization in the original.
[2] Diagnostic Study on the Present State of Ecology and Environmental Management of the common Zambezi River System. UNEP/IG.78 Background Paper 1 (10 Mar. 1987).
[3] Id. at 21.
[4] Id. at 31-32
[5] Project (ZACPRO) 5.1 in appendix I to ZACPLAN. Annex 1, Final Act, Conference of Plenipotentiaries on the Environmental Management of the common Zambezi River System 1987, the United Nations doc. UNEP/IG.78/3 (1987).
[6] ZACPRO 5.2, para. (d)

WATER QUALITY PROTECTION

1. The Parties undertake cooperatively to protect and to improve, insofar as practicable, the quality of transboundary aquifers and their waters in conjunction with their programs for surface water quality control, and to avoid appreciable harm in or to the territories of the Parties.

2. The Governments shall promptly inform the Commission of any actual or planned, significantly polluting discharge into transboundary groundwaters or recharge areas, or of other activity with the potential for significant leaching into transboundary groundwaters.

3. The Commission shall without delay consider the gravity of any situation indicating significant groundwater contamination, or the threat thereof, in any part of the border region in accordance with the provisions of Article VII.

COMMENT:

1. The general obligation to preserve and to improve groundwater quality is first stated; these measures are to be undertaken together with the Parties' surface water quality control efforts. Appreciable harm is to be avoided in another Party's territory (Paragraph I).

2. Whenever a significant discharge is contemplated or made into the international groundwaters, or into a recharge area, there is a duty of each government to inform the Commission. Inform" imports more than a mere notification; circumstances, justifications and technical data with in respect to such discharges are to be provided. Moreover, when a discharge is hazardous, modem practice requires timely warning to the potentially concerned States. In addition, the obligation to inform the Commission applies with respect to dumping, storage, feedlot, dip tank, decontamination, drainage and other works, known often to result in aquifer pollution where over time their leachates reach the water table (Paragraph 2).

3. The issue of water quality is coming increasingly to the fore. With respect to groundwater, the prevention-{)r at least the informed control of aquifer pollution is much more imperative than even for surface water pollution. Groundwater moves slowly and is not exposed to aeration.

Self-purification is in the usual case extremely limited underground. Once contaminated, an aquifer may be unusable for decades or centuries. Pollution by toxic chemicals can be particularly calamitous. Cleanup, even where physically feasible may involve pumping out the groundwater, neutralizing the contamination, storing the more-or-less cleansed water thus produced, and ultimately reinjecting the water into the aquifer. The cost of such efforts is usually absolutely prohibitive. Another source of water must be found, or at best the use to which such degraded water may be put will have to be shifted to one for which such water is not entirely unsuitable. Even so, costly pretreatment of the water (before being applied in agriculture or industry) could be necessary. In arid situations a suitable alternative source may simply not be available, or would

require costly diversions and transfers from great distances. Such alternative supplies will entail their own legal, social, economic and environmental "complications. " The Agreement seeks to provide the Parties with the basic legal framework to deal with the problem; later articles will provide the requisite mechanisms in implementation of these provisions.

ARTICLE VII
TRANSBOUNDARY GROUNDWATER CONSERVATION AREAS

1. The Commission shall determine the desirability of declaring any area within the border region containing transboundary groundwaters to be a Transboundary Groundwater Conservation Area.

2. In the event that the Commission determines that a Transboundary Groundwater Conservation Area is desirable, such determination shall be reported to the Governments with a draft of the proposed declaration and justification therefore, including the delineation of the area and its aquifer(s).

3. If no Government files an objection with the Commission within one hundred eighty (180) days, the Commission shall issue the formal I declaration. Any objection(s) filed shall specify, with an explanation the objectionable section(s) of the proposed declaration or justification or both.

4. Unless an objection requires termination of consideration the Commission shall within ninety (90) days of receipt of objections report to the Governments a revised proposed declaration, to be effective Paragraph within ninety (90) days, unless a Government files a subsequent objection with the Commission. If no subsequent objection is filed within the said ninety (90) day period, the formal declaration shall be issued control by the Commission. If a subsequent objection is filed within the ninety face water (90) day period the Commission shall refer the matter together with aeration the entire record to the Governments for resolution by consultation.

5. In making its determination, the Commission shall consider whether:

a) groundwater withdrawals exceed or are to exceed recharge even so as to endanger yield or water quality or are likely to diminish water, the quantity or quality of interrelated surface waters;

b) recharge has been or may become impaired;

c) the use of the included aquifer(s) as an important source of drinking source o water has been or may become impaired water;

d) the aquifer(s) have been or may become contaminated and;

e) recurring or persistent drought conditions necessitate management it of all or some water supplies in the particular area or would

6. In making its determination the Commission shall take into account such alter- the impact of the implementation of the declaration under consider and enviation on the sources and uses of water previously allocated by agreements between the Parties or under the Drought Management Plan.

7. The Commission shall periodically review the appropriateness of continuing or modifying Transboundary Groundwater Conservation Areas.

COMMENT:

1. At the outset, the Commission only determines the *desirability* of any area creating conservation areas. The term "conservation" is employed in its broadest sense to include all manner of quality as well as quantity management concerns. When such a determination is made, the Commission refers the matter to the Governments, with supporting documentation (Paragraphs 1 and 2).

2. The Governments are given an agreed period of time to object, absent which the Commission proceeds to issue its declaration. Obviously the periods specified in the Draft could be altered to fit the Parties', preference in this regard. The time limits provided are arbitrary and could on within one be shortened or lengthened, or a phrase such as "within a reasonable time" could be substituted for the indicated number of days within which explanation, a Government must file an objection. However, in the interest of limiting justification delays and avoiding altercations over how much time is "reasonable" while communicating a sense of some urgency, it was thought preferable to express precise time periods (Paragraphs 3 and 4). Should the Governments jointly so instruct their Commission, the waiting periods could, of course, be waived.

3. Some of the Article is essentially procedural, with each Government's prerogatives protected, but allowing the Commission to take action without indefinite delay (Paragraphs 2,3 and 4). These procedures reflect a carefully considered balancing of the Commission' s need to act and the Governments need to exercise final policy judgment. There is a need for the body, which is closest to the problem-in, this case the Commission with its technical expertise, hands on experience, and knowledge base-to be able to act promptly. At the same time governments must be in a position to have the final word.

4. In the case of the U.S.-Canada International Joint Commission (IJC) there is widely expressed frustration that the Commission cannot act in a timely fashion because it must await a "reference" from the Governments before acting. For example Sadler concludes that there is a need for a "more expeditious process" and that ways must be found to allow the IJC to gain timely entry into emerging conflicts…"[1] He goes on to say that by the time the IJC can act it is often a case of

[1] Sadler, supra note 38, at 374.

too little too late."[1] Frequently by the time a problem can gain the attention of the authorities in national capitals, the situation may already be in crisis. The Standing Senate Committee on Foreign Affairs of the Canadian Parliament recommended that the IJC should be given authority to make, on its own initiative, preliminary examinations or assessments of potential pollution problems along the boundary, to point out potential sources of trouble and dispute..."[2] The Canada-U.S. University Seminar recommended that the IJC be "freed from the present Treaty constraint of acting only when a matter is referred to it by both countries."[3] With this experience in mind, the Agreement gives responsibility to the Commission to determine the desirability of declaring a Transboundary Groundwater Conservation Area; the Governments are then given the opportunity to consider the matter and object before a declaration may be issued.

5. Paragraphs 5 and 6, however, oblige the Commission to take specified factors into account in arriving at a determination. These requirements are intended to ensure that there are always properly grounded bases for its recommended determinations. Categories of circumstances are anticipated. For instance, under Paragraph 5c: Heavy pumping can result in an aquifer's water becoming unsuitable for drinking, or for municipal, agricultural or industrial uses, by bringing up poor quality water from the aquifer's lower reaches, or by inducing the migration of saline or otherwise contaminated water to the pumping sites. And biologically contaminated aquifers have become a pressing problem.[4]

6. Some members of the Ixtapa group doubted a joint commission's act and the ability to reduce water use under conditions of increased scarcity and of a need for drought. One thought

> that this is particularly the case in many of the developing countries... When water supplies are overstretched, too many people be in a are attempting to scratch out a living on land for which there is too water, "reallocation" becomes tantamount to deciding who might live and who might not...socio-economic factors must act in dominate; efficiency, environmental, and hydrological considerations fade quickly in any priority sense when existence is at stake.
>
> ...
>
> The Commission might well play a most useful role in providing leadership in a area that often receives little attention in poorer parts of the world where priorities necessarily center on short-term survival, in promoting... policies which anticipate scarcity problems. In other words... policies designed *to prevent* the need for "cures" which may never take. The structuring of compelling data which point

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[1] Id. at 372.

[2] I Standing Committee on Foreign Affairs. Canada.United States Relations: The lnstitutional Framework of the Relationship [1975]. as restated by Dworsky, The Great Lakes: 1955.1985. 26 Nat. Res. J. 291,323 (1986).

[3] Id. at 321.

[4] See. e.g., American Water Resources Assoc., Proceedings of the 1986 International Symposium on Biofouled Aquifers: Prevention and Restoration (D. Cu1limore ed. 1987) (Bethesda, Md.).

to the inescapability from severe drought and/or scarcity conditions might bring some attention to such things as relocation programs, and *early* efforts to promote conservation... The bottom line is that once we get to the point of "declaring" a [transboundary] groundwater basin, the time for effective action may have already passed....[1]

7. The final paragraph mandates periodic review by the Commission and allows it to propose modifications as well as continuance and discontinuance.

ARTICLE VIII
COMPREHENSIVE MANAGEMENT PLANS

1. For each declared Transboundary Groundwater Conservation Area, the Commission shall prepare a Comprehensive Management Plan for the rational development, use, protection and control of the waters in the Transboundary Groundwater Conservation Area.

2. A Comprehensive Management Plan may:

a. prescribe measures to prevent, eliminate or mitigate degradation of transboundary groundwater quality, and for that purpose may:

(1) classify transboundary groundwaters according to use and coordinate the formulation of water quality standards;

(2) identify toxic and hazardous contaminants in the Area and require a continuing record of such substances from origin to disposal;

(3) establish criteria for the safe storage of wastes and maintain an inventory of dump sites, abandoned as well as active, that have caused or may cause transboundary aquifer pollution;

(4) propose a scheme for monitoring water quality conditions including the placement and operation of test wells and for remedial actions where required, including pretreatment and effluent discharge limitations and charges; and

(5) provide for the establishment where required of protective zones in which land use must be regulated.

b. allocate the uses of groundwaters and interrelated surface waters taking into account any other allocation(s) previously made applicable within the Transboundary Groundwater Conservation Area.

c. prescribe measures including pumping limitations, criteria for well placement and number of new wells, retirement of existing wells, imposition of extraction fees, planned depletion regimes or reservations of groundwaters for future use .

d. arrange, where conditions are favorable, programs of transboundary aquifer recharge .

e. articulate programs of conjunctive use where appropriate .

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[1] Memo from Ron Cummings to Albert Utton 1-2 (Jan. 25, 1988) (Be1lagio Draft Treaty, unpublished memo, Univ. of New Mexico Dept. of Economics). Emphasis in the original.

f. prescribe the integration and coordination of water quality and quantity control programs .

g. include other measures and actions as may be deemed appropriate by the Commission.

3. In making any allocations of water uses within a Comprehensive Management Plan , the Commission shall consider all relevant factors such as:

a. hydrogeology and meteorology;
b. existing and planned uses;
c. environmental sensitivity;
d. quality control requirements;
e. socio-economic implications (including dependency);
f water conservation practices (including efficiency of water use);
g. artificial recharge potential; and
h. comparative costs and implications of alternative sources of supply.

The weight to be given to each factor is to be determined by its importance in comparison with that of the other relevant factors.

4. The Commission shall submit proposed Comprehensive Management Plans to the Governments.

a. If no Government files an objection with the Commission within one hundred eighty (180) days, the Commission shall adopt the Plan and monitor its implementation.

b. A Government' s objections shall specify with an explanation the objectionable portions of the proposed Comprehensive Management Plan.

c. Within ninety (90) days of receipt of objections, the Commission shall submit to the Governments a revised proposed Comprehensive Management Plan to be effective within ninety (90) days unless a subsequent objection is filed. If no subsequent objection is filed with the ninety (90) day period, the proposed Comprehensive Management Plan shall be adopted and the Commission shall monitor its implementation. If subsequent objections are filed within the ninety (90) day period, the Commission shall refer the matter, together with the entire record, to the Governments for resolution by consultation.

5. The Commission is authorized to approve advances and exchanges of water consistent with the objectives of the applicable Comprehensive Management Plan.

6. The Commission shall monitor and evaluate the measures taken under the Comprehensive Management Plan and shall propose, as approid priate, modifications there to.

COMMENT:

1. The need for an institutionalized capability to recognize and manage “troubled” areas, for a wide variety of purposes, is now widely recognized. This Article purports to supply the requisite administrative mechanisms for planning and then for carrying out the corrective and protective measures deemed by the Commission's staff (and approved by the Governments) to be appropriate and needed in the particular circumstances. Each Transboundary Groundwater Conservation Area would have its own Comprehensive Management Plan, though linkages with other, especially adjacent Areas might well be involved. Without this kind of itemized agreement, such plans and their execution might meet with interminable resistance not only from concerned national agencies and political jurisdictions but from within the Commission itself. Arriving at a sufficient and balanced management plan will in any event require overcoming many hurdles and hindrances, without the Commission's scope of authority in principle being inordinately debated (Paragraphs I and 2). One or more of a variety of remedial or anticipatory measures may be called for, for instance, special works and diversions to recharge an aquifer. [1]

2. A draft Code of Conduct on Accidental Pollution of Transboundary Inland Waters has been prepared for ECE, intended as a guide in cases of accidents or natural disasters. The Code's Preamble affirms that "accidental pollution can create specific threats to inland water resources" with particular reference to groundwaters," and stresses the urgency of "promoting all measures which stimulate rational, economic and efficient use and prevention and abatement measures to ensure economic development in a manner compatible with the maintenance and improvement of the quality of life for present and future generations. [2]

3. The Comprehensive Management Plan may prescribe a number of measures to protect groundwater quality, not excluding some land use controls (Paragraph Such land use regulation, where required, would be confined to the limits of declared Transboundary Groundwater Conservations Areas. Because the pollution of groundwater can result from leaching, dumping and discharges on land, with no actual water use involved, the Commission may need to establish protective zones in which land use is regulated to limit or bar the entry of contaminants. Land use concepts such as "limited use zones" may be employed, whereby certain polluting activities are confined to the smallest possible areas, if not excluded entirely (as in the case of processes with highly toxic effluent) in order to isolate them from areas of important natural recharge. The concept of "Limited use zone" has as its direct counterpart the concept of "sole source. " A sole-source designation might be made, for example, in the case of a water body

[1] See generally, Gov't of India. Ministry of Water Resources. Central Ground Water Board. Intemational Seminar on Artificial Recharge of Ground Water, Proceedings (New Delhi, Oct. 1985).
[2] United Nations doc. ENVWAlWp.3/R.l. and Add. I, 20 May 1988. at 4-6 (from the Introduction).

providing a community's only source for drinking water. The sole-source designation excludes polluting activities from the vicinity of that source. [1]

4. Among the instructive propositions making up the ECE Draft Code of Conduct on Accidental Pollution of Transboundary Island Waters is Rule 5.5, holding that the system States should co-ordinate and harmonize legislative and administrative measures, "particularly as regards criteria for defining hazardous activities and substances, contingency plans at all levels, monitoring, safety and other relevant matters such as land-use planning and water management planning. " They should also carry out "vulnerability assessments ...with a view to identifying sensitive areas with regard to their ecological situation and/or use of their water resources." [2]

5. On land-use planning, the Draft code urges:

> that hazardous activities or substances likely to cause such pollution should be excluded from sensitive or protected areas and adequate buffer zones should be established between hazardous installations and sensitive or protected transboundary inland waters. Increased attention should be paid to the control of abandoned sites of hazardous activities…[3]

Annexes to the Code provide useful specifics on desirable functions of international institutions, terms and conditions of administrative authorization techniques, notification of incidents, damage assessment, etc.

6. Paragraph 3 imposes upon the Commission the duty to identify and weigh "all the relevant factors" when making water use determination under the plans. This language has become accepted virtually universally since the adoption by the ILA in 1966 of the Helsinki Rules. Those Rules, in Article V (part of Chap. 2, Equitable Utilization of the Waters of an International Drainage Basin) set forth an array of "factors " not intended to be exhaustive. Several other attempts to compose a listing of factors have been made; most of them patent imitations of Art. V of the Helsinki Rules. There is one effort worthy of note, however, taking a somewhat different approach to the problem, that is, how to bring the "equitable utilization" doctrine, so universally acclaimed in principle, "down to earth" in a concrete case. In Schwebel's Third Report, this variation is cast in a proposed article on "Clarifying the ascertainment of equitable use":

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[1] See Rogers & Utton. supra note 1, at 763-64 (1985) and Teclaff .Transboundary Groundwaler Pollulion: Survey and Trends in Treaty Law, 19 Nat. Res. J. 629 (1979). More generally. see M. Arsanjani. Intemational Regulation of Intemal Resources: A Study of Law and Policy 61 (1981).

[2] Supra note 53, Rules 5.5 and 13.5.

[3] Id. Rule 13.6.

1. The right of a system State to a particular use of the water resources of the international watercourse system depends, when questioned by another system State, upon objective evaluation of:
a. That system State's:
(1) contribution of water to the system, in comparison with that of other system States,
(2) development and conservation of the water resources of the system,
(3) degree of interference, by such use, with uses or protection and control measures of other system States,
(4) other uses of system water, in comparison with uses by other system States,
(5) social and economic need for the particular use, taking into account available alternative water supplies (in terms of quantity and quality), alternative modes of transport or alternative energy sources, and their cost and reliability, as pertinent,
(6) efficiency of use of water resources of the system,
(7) pollution of system water resources generally and as a consequence of the particular use, if any,
(8) cooperation with other system States in projects or programs to attain more optimum utilization and protection and control of the system, and
(9) stage of economic development;
b. the total adverse affect, if any, of such use on the economy and population of other system States, including the economic value of and dependence upon existing uses of the waters of the system, and the impact upon the protection and control measures of the system States;
c. the efficiency of use by other system States;
d. availability to other system States of alternative sources of water supply, energy or means of transport, and their cost and reliability, as pertinent;
e. cooperation of other system States with the system State whose use is questioned in projects or programs to attain optimum utilization and protection and control of the system.
2. The determination, in accordance with paragraph 1 of this article, of the equitableness of a use as part of a system State's equitable participation shall be undertaken through good faith consultation among the system States concerned at the request of any system State.
3. Failure to reach agreement on such a determination within a reasonable time entitles any system State participating in the consultations to invoke the means provided in these articles for the pacific settlement of disputes.[1]

The earlier "Helsinki" approach reads as follows:

(1) What is a reasonable and equitable share ...is to be determined in the light of all the relevant factors in each particular case.

[1] Art 7, "equitable use determinations, " ILC Third Report, supra note 27, Comment to Art. I at 70- 71; see id. at 60-70 and 71-73 for discussion, consideration of other formulas and supporting documentation.

(2) Relevant factors which are to be considered include, but are not limited to:
(a) the geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;
(b) the hydrology of the basin, including in particular the contribution of water by each basin State;
(c) the climate affecting the basin;
(d) the past utilization of the waters of the basin, including in particular existing utilization;
(e) the economic and social needs of each basin State;
(f) the population dependent on the waters of the basin in each basin State;
(g) the comparative costs of alternative means of satisfying the economic and social needs of each basin State;
(h) the availability of other resources;
(i) the avoidance of unnecessary waste in the utilization of waters of the basin;
(j) the practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and
(k) the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

(3) The weight to be given to each factor is to be determined by I its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.[1]

7. The formula presented in Paragraph 3 of the Agreement is a much condensed version of the now-traditional concept; nonetheless, all the major categories of factors are covered. The numerous ancillary and procedural requirements contained in, for example, Schwebel's Third Report, which would operate in the absence of agreement between the States concerned, are deemed unnecessary here because of the presence of a Commission with jurisdiction. The Parties' joint agency provides the legitimate forum within which to identify those factors relevant to each case taken up, as well as the relative weight to be accorded to each factor under the circumstances. On the other hand, the Parties to an agreement of this kind may well choose to spell out the "factors" and the manner of consideration in more detail, possibly based on the Helsinki or Schwebel model.

8. In appropriate cases, the traditional rights to groundwater of nomadic or tribal peoples in the border region may merit separate identification as a factor which the Commission shall take into consideration.

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[1] Art. V. Helsinki Rules, supra note 5 of Introduction, at 11.

9. The Agreement would give the Commission the power, pursuant to an approved Comprehensive Management Plan, to authorize withdrawals in excess of a user's allowance (to be compensated at a future time) and to permit such exchanges of water between or among users as will promote the attainment of the Plan's objectives (Paragraph 5). These possible variations under the Plan provide a supervised degree of flexibility could prove highly beneficial in the attainment of the Plan ' s objectives. Such. approvals might vary, albeit temporarily, the source shares set forth in prior agreements. The Commission, It must be remembered, is a joint instrument of the Governments and would not proceed imprudently.

10. "The Legislature finds, recognizes, and declares that the management and conservation of groundwater and the beneficial use thereof are essential to the economic prosperity and future well being of the state...the public interest demands the implantation of management practices to conserve groundwater supplies ...to provide for an orderly management system. ...[1]

11. The approval procedure for the Commission's proposed Comprehensive Management Plans again preserves the prerogatives of the Governments but allows the Commission to implement a plan when there are no objections or where objections have been accommodated by revision of the plan (Paragraph 4).

ARTICLE IX
PUBLIC HEALTH EMERGENCIES

1. Upon a determination by the Commission or any Government that there is an imminent or actual public health hazard involving the contamination of transboundary groundwaters, the Commission shall notify the respective Governments, and may declare a Public Health Emergency for a stated period.

2. In the event that the Public Health Emergency is not mitigated or abated within the initial stated period, the Commission may extend the emergency for such additional period as may be deemed necessary under the circumstances.

3. On the basis of the declaration, the Commission shall have authority to investigate the area of imminent or actual contamination an to prescribe measures to prevent, eliminate or mitigate the public health hazard.

4. The Governments shall provide the indicated information, data, studies and reports concerning public health emergencies as set forth Paragraphs 2 and 3 of Article IV.

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[1] Neb. Rev. Stat. § 46-656. Emphasis added.

COMMENT:

1. Because the transmission of water-related disease or other public health hazard is likely to be a concern in border regions, the Agreement provides specially for public health emergencies. Each Party has its health legislation, but coordinating health measures across international boundaries requires additional machinery; where the public health laws are principally at the constituent state or province an override for transnational action and supervision by a joint body is of particular importance. The danger would be to both countries.

2. Investigative power is here conferred on the Parties' Commission along with the authority to prescribe measures, once the emergency has been declared. The determination that a public health hazard exists or is imminent can be made by a Government or by the Commission, on the basis, of course, of information provided by the competent health authorities. A declared emergency is limited to a period of time as set forth in the declaration, which, however, may be extended if necessary (Paragraph 2). Since the Commission is the joint instrument of the Parties, not a so-called "supernational" body, hasty or inappropriate action would not be taken.

ARTICLE X
PLANNED DEPLETION

1. The Commission, after evaluation of alI relevant considerations, may prepare and, with the consent of the Governments, may approve a plan for the depletion of an aquifer over a calculated period. The plan may apportion the uses and specify the rates and means of extraction of the transboundary groundwaters, and may authorize advances, exchanges and transboundary transfers of water consistent with the objectives of the Depletion Plan.

2. The Governments shall provide the indicated information, data, studies and reports concerning depletion as set forth in Paragraphs 2 and 3 of Article IV.

COMMENT:

1. Above all in arid regions, where surface waters are-to the extent they are available at all-likely to be fully committed and reliance on groundwater is necessary, both for quantitative and qualitative reasons, aquifers are often drawn upon at rates exceeding recharge. In fact, recharge may be minimal if not nil in some cases. Groundwater may as a consequence be treated, in effect, as a nonrenewable resource: the aquifers will in due course and for all practical purposes be "emptied. " When such aquifers are no longer producing, or the quality of the water in their lower regions has deteriorated to the point where it is not suitable for one or more uses, communities face water "starvation" unless alternative sources can be developed or efficiency of use can be increased drastically. Less intensive water-use industrial processes, a switch to poor-water tolerant crops, and water rationing even for domestic uses are "unpopular" and uneconomic steps that are nonetheless indicated or indispensable in such

circumstances. In order to postpone even more Draconian results, water conservation measures should be put in place as early as practicable. And the drawdown on the aquifers should be subjected to a regime that plans for “mining" (depletion) over a calculated number of years. Hard political and economic choices are involved. The life of the communities is at stake. At least time is afforded to the planners to find “a way out."

2. Planning for depletion, as well as for efficacious conservation measures, where the aquifers are transnational requires joint action. Without joint action, the communities on each side of the border will perforce continue their “use race," knowing that if pumping is reduced on one side only, all the water will simply be withdrawn on the other side of the border. As is well known, this is a wholly unsatisfactory state of affairs. T

3. The Agreement establishes a mechanism for planned depletion, should such be so decided, of transboundary groundwater. Merely slowing l down the overall rate of abstraction is not enough. Certain uses must be given priority; certain uses must be curtailed or discouraged; some water withdrawal rights will necessarily have to be modified. These are serious matters requiring careful evaluations and timing. To alleviate some of the consequences, under an approved depletion plan the Commission may provide for the “trading" of water from one source for that of another “borrowing " on future quotas, for “rotation " of withdrawals and even for transfers of water from one side of the border to the other in special circumstances, perhaps as an advance on future allocations. Obviously such measures are not taken under normal conditions. Radical measures may be unavoidable when depletion of transfrontier aquifers is “programmed" (Paragraph 1).

4. The Commission would monitor the implementation of an approved plan by the national and local agencies, on the basis of information and reports from the Governments (Paragraph 2).

5. One or more plans for depletion might very well be annexes to the f Commission's Comprehensive Management Plan for a described Area.

6. The issue of “mining groundwater" is not a new one, particularly along the Mexico-United States frontier. The matter is complex. The State Engineer of New Mexico, for example, suggests that, if it were determined to fix a “life" for the basin and each nation's annual rate of withdrawal were simply apportioned,

> deferral of development would be discouraged and there would be a race to achieve the allowed rate of withdrawal at the earliest time to maximize the quantity that could be taken within the ‘life' of the basin. On the other hand, if there is no limitation on the annual rate that nation which takes its allocated quantum at a slower rate will have greater pumping lifts and possibly a worse quality of water. ...
>
> In most situations it probably would be useful also to require some areal distribution of withdrawals to insure that one country does not damage

> the other (and perhaps itself) by concentrating its withdrawals along the international boundary.[1]

7. The economic factors which must be considered in the planned depletion of a transboundary aquifer can be exceedingly complex. This can be especially true where the countries sharing the aquifer are at different levels of economic development. For example, Cummings observes that:

> the state with the higher development level will most likely be pumping water at faster rates than the neighboring state, giving rise to the state's fear of losing part of its resource endowment-the specter of “use it or lose it" may also be relevant from states' points of view.[2]

This in turn, could require that:
...(i) State B must accelerate its development so as to match its annual beneficial use of mined water (in quantitative, physical terms) to that of State A, a “solution" that State B might find highly objectionable; (ii) or State A must reduce its rate of mining to that required for State B's level of development, a “solution" that State A would surely find objectionable given the depressive effect implied for its current level of economic activity.[3]

8. The Ixtapa Draft Agreement pointed out the merit of rationally mining groundwater in appropriate circumstances, even though “mining"
is in conflict with concepts such as “safe yield an “sustained yield”. These concepts of “safe yield" and “sustained yield" contemplate the wholly admirable purpose of preserving the water supply in perpetuity for future generations, Nonetheless, Corker argues that “sustained yield" should not be a sacred principle, In those cases where there is minimal recharge, “sustained yield" may not be realistic if the resource is to be utilized. In those cases “mining" may be rational policy.[4]

9. The New Mexico Supreme Court has acknowledged the validity of mining ground waters for reasoned policy goals and at the same time it recognized the need for careful management of such mining:
The administration for a non-rechargeable basin, if the waters therein are to be applied to a beneficial use, requires giving to the stock or supply of water a time dimension, or, to state it otherwise, requires the fixing of a rate of withdrawal which will result in determination of the economic life of the basin at a selected time.

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[1] Letter frorn Steve Reynolds. State Engineer. Santa Fe. NM, to Albert Utton (Aug. 29, 1977).

[2] J. Muys. R. Cummings & K. Burke, Interstate Groundwater Management 59 (1984) (paper prepared for Western Governor’s Policy Office).

[3] Id. at 63; see also discussion in Rogers & Utton, supra note I, at 957; Kelso. Martin & Hack, Water Supplies Are Economic Growth In An Arid Environment, An Arizona Case Study (1978).

[4] C. Corker. Groundwater Law. Management andAdministration 174, in National Water Cormission (1971).

The very nature of the finite stock of water in a non-rechargeable basin compels a modification of the traditional concept.... Each appropriator, subsequent to the initial appropriation, reduces in amount, and in time of use, the supply of water available to all prior appropriators, with the consequent decline of the water table, higher pumping costs, and lower yield.[1]

ARTICLE XI
TRANSBOUNDARY TRANSFERS

Nothing in this Agreement shall be so constituted as to preclude either short-term or long-term transfers of waters between the Parties under terms and conditions approved by the Commission.

COMMENT:

1. This Agreement would have "treaty" status and, thus, be the "law of the land. " Prior treaties or understandings may have allocated water on the basis of designated sources of supply. This provision does not refer to existing commitments or allocations, but Article IX dealing with planned depletion does contemplate the possibility of modifying such allocations.

2. This Article merely makes it clear that the instant agreement is no intended to exclude the transfrontier transfer of water, though such transfers must be with the approval of the Commission.

3. The matter of inter-basin transfers is a well-studied one.[2] However, the question of inter-country transfers, and the water may even be from the same basin, surface or underground, has not been the object of much study to date.

ARTICLE XII
PLANNING FOR DROUGHT

1. The Commission shall, within two (2) years of the coming into force of this Agreement, complete the preparation of a Drought Management Plan applicable to the border region for activation in the region, or in parts thereof, in the event of drought. The completed Plan shall be submitted to the Governments for standby approval.

2. The Drought Management Plan shall:

a. specify the hydrometeorological preconditions for the declaration of a Drough Alert and, thereunder, the conservation measures to be observed by all water users within the border region;

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[1] Mathers v. Texaco, Inc. 77 N.M. 239.243-4,421 p.2d. 771.775 (1966).

[2] See. e.g.. R. Cummings, Interbasin Water Transfers; A Case Study in Mexico (1974); Howe & Easter. Interbasin Transfers of Water (1971).

b. specify the hydrometeorological preconditions for the declaration of a Drought Emergency and, thereunder, the specific measures to be observed by all water users within the border region;
c. provide for the monitoring of the hydrometeorological conditions generally in the border region and compliance with prescribed conservation or other specific measures under any Drought Alert or Drought Emergency; and
d. provide for periodic reports to the Governments during any Drought Alert or Drought Emergency to include any proposed modifications to the Drought Emergency Plan and any modifications made to the prescribed measures under any Drought Alert or Drought Emergency.

3. The Drought Management Plan may:

a. designate and reserve certain transboundary aquifers or specific law well sites for use in times of drought;

b. provide, for the duration of any declared Drought Emergency:

(1) the conjunctive management of groundwater and surface water supplies within or made available to the border region or part(s) thereof governed by the declaration;

(2) increases and reductions in the normal allowable withdrawals and at variance with allocations made under a Comprehensive Management Plan for a Transboundary Groundwater Conservation Area or by prior agreements between the Parties maintaining to the extent practicable the established withdrawal ratios between the Parties and an equitable balance of all emergency obligations .

(3) authorization to use designated and reserved groundwaters within the border region.

c. include other structural and nonstructural measures deemed likely to be needed under various drought conditions .

4. The conservation and other specific measures provided in the Plan or for Drought Alert declarations O! Drought Emergency declarations may be modified or suspended by the Commission to meet the specific requirements of the situation at the time of such declarations and during the time such declarations remain in force.

5. The authority to determine the existence of the preconditions specified in the approved Drought Management Plan and to declare drought alerts and drought emergencies thereunder in any portion of the border region, is vested in the Commission.

6. The Commission is authorized to modify or terminate a declaration of Drought alert or of Drought Emergency when the hydrometeorological conditions so warrant.

7. Declarations of Drought Alert and Drought Emergency, and modifications to or termination of the same, shall be immediately communicated to the Governments and published so as to come to the attention of all water users in the border region.

8. The Governments shall provide the indicated information, data, studies and reports concerning drought as set forth in Paragraphs 2 and 3 of Article IV

COMMENT:

1. There are three essential aspects to the Commission' s function concerning drought: The Commission must have the ability to anticipate it, research the consequences of drought, and develop a plan for the best measures to alleviate its harsh consequences. This Article is written so as to allow for either reducing or increasing withdrawals in the event of drought. The plan must be approved by the respective Governments (Paragraph 1). .

2. Conjunctive management of the resource treats both surface and groundwaters as one system, using groundwater when surface flows are reduced and then using aquifers for storage when surface flows are in surplus. Aquifers often are not immediately affected by drought, as are surface flows, and may provide excellent storage to be used to make up for future reduced flows. Increased withdrawals may then be made available in case of drought; in other situations, prudent management could call for reduced withdrawals. For example, the Commission might reduce withdrawals in the event of a prolonged drought which could significantly affect recharge.[1] Teclaff gives examples of reduction in use of water during times of drought[2] (Paragraph 3).

3. The Commission is directed to prepare a Drought Management Plan, to include all the preconditions for declarations and the monitoring and reporting requirements; provision is made for modification of the Plan and for modification or termination of declarations in force. Drought emergency plans should include non-structural measures such as insurance and disaster relief to mitigate the consequences of drought. The response to drought may be phased according to the anticipated length of the drought (Paragraphs 2, 4 and 6).

4. In order to provide the Commission some flexibility in dealing with drought conditions a two stage process is contemplated. The first stage is the Declaration of Drought Alert, under which water conservation measures may be established. If the dry conditions continue or worsen, it may be appropriate to go to the next stage by the Declaration of a Drought Emergency. Under a Drought Emergency a range of measures may be taken ranging from conjunctive management to use of

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[1] See. e.g., the Delaware River Basin Compact, Art. 3.3(a) and Art. 10.4 (Emergency) U.S. Pub. L. No.87-328, 75 Stat. 688 (1961).

[2] Abstraction and Use of Water: A Comparison of Legal Regimes, U.N. Doc. ST/ECA 154 by L. Teclaff (NewYork 1972). See also R. Hayton, Drought Emergencies And Contingency Planning: Legal And Institutional Aspects (1977).

designated drought reserves of groundwaters. The Drought Management Plan must specify the preconditions for the declarations and the measures that may be taken under “Alerts" and “Emergencies" respectively.

5. Paragraph 3 of this Article contemplates an equitable sharing of the burdens or hardship associated with drought. It has been suggested that any increase or reduction in withdrawals could be borne by each Party in proportion to the allowed withdrawal. In any event, the Commission should determine the allocation of burden without relying on a rigid proportional formula. The United States Supreme Court in Arizona v. California, rejected the special master's recommendation that there should be a “pro rata sharing of water shortages." The Court said that although the pro rata approach “seems equitable on its face....We should not bind the Secretary [of the Interior] to this formula. " The Court went on to give the Secretary flexibility to “devise reasonable methods of his own " and concluded that “the Secretary may or may not conclude that a pro rata division is the best solution. "[1]

ARTICLE XIII
INQUIRY IN THE PUBLIC INTEREST

1. The Commission shall by general notice invite written statements and information from all persons professing interest in the groundwater related conditions and activities in the portion of the border region for which a Transboundary Groundwater Conservation Area declaration, a Comprehensive Management Plan, a Depletion Plan, a transboundary transfer or a Drought Alert or Emergency declaration is under consideration.

2. All submissions received pursuant to Paragraph 1 shall be taken into account by the Commission.

3. Whenever the Commission deems that public interest warrants, it shall schedule and conduct hearings open to the public in appropriate places and facilities in the border region, and shall make and publish a record of such hearings.

4. Any person professing an interest may also petition the Commission at any time requesting the Commission to schedule a hearing or to invite written statements and information concerning groundwater conditions in the border region, or urging the Commission to take a particular action under this Agreement.

5. When deemed useful by the Commission, technical meetings, workshops and briefings relating to transboundary groundwater matters may be held under the

[1] 373 U.S. 546. 553 (1963).

auspices of the Commission or in cooperation with authorities and organizations concerned with the welfare of the border region.

COMMENT:

1. Frequently the parties most affected or interested in the actions or planning decisions of the Commission will be local, state or provincial governments, as well as interested individuals, enterprises and non-governmental organizations. This Article allows a regularized vehicle for the Commission to be able to receive and benefit from the inputs of those who are most worried about existing and threatening conditions and also about any remedial measures that may be adopted, including the governments of cities, counties and states (particularly in federal systems). The border-region representatives of national and regional agencies could also be profitably involved. In turn these inquiry provisions allow an opportunity for active participation by all such entities, which moreover can be important in building local, regional and even national support for important policy decisions such as those required in establishing Comprehensive Management Plans, the Drought Management Plan and Plans for Depletion. There is the risk, of course, that such participation may cause some delay in the decision making process, but in the longer run the important inputs derived from, and support of, affected publics will be worth the effort. That the Commission will in fact be better informed about the factors involved, including the intensity and extent of views, will lead to better, and better received decisions. The value to the whole "enterprise" of extending the "courtesy of consultation" should not be underestimated.

2. In another context, the U .S.-Canada International Joint Commission (IJC) itself has recognized that "the challenge becomes increasingly one of engaging public support for new approaches and programs that are needed. "[1]

3. In the controversy over the Skagit-High Ross Dam, the IJC successfully involved directly the concerned governments in negotiations (i.e., the Governments of the Province of British Columbia and the City of Seattle); non-governmental organizations were strategically important participants. The Hig Ross Agreement is cite as one o the great successes of the IJC- “an example of conflict resolution at its best"[2] It is suggested that “the lesson for bureaucracy is clear: other publics must be brought sincerely and openly into the planning process early…”[3]

4. Nevertheless, the need to expand public participation in the work of the IJC is still widely expressed" For example, Dworsky says “action matters will be needed to bring together representatives of urban and rural constituencies [and]

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[1] The International Joint Commission, Second Biennial Report Under The Great Lakes Water Quality Agreement of 1978 to the Governments of the United States and Canada and the States and Provinces of the Great Lakes Basin 1 (Dec. 1984).

[2] Kirn & Marts, The Skagit-High Ross Controversy: Negotiation and Settlement, 26 Nat. Res. J. 261, 289 (1986).

[3] Id. at 287.

federal, provincial, and state government representatives in a setting that will provide for communication among several parties."[1] Sadler recommends "arrangements which allow a greater operational role for interest groups and indeed non-central governments". [2] On the U.S.-Mexico Border, Mumme documents the important role that state governments play in border water issues.[3] To date, local authorities in the border area are ordinarily not represented in formal decision making processes regarding resource questions, such as the negotiation of action plans and for the agreements. In the words of Ingram, this "lack of representation can be frustrating to local and state officials who feel closest to the problem."[4] She warns that institutional and political capacity have not kept pace with "escalating" international resources issues in the U"S"-Mexico border area, and that "the consequences of growing problems outpacing mechanisms for solutions is especially Important to states because a disproportionate share of the negative consequences falls upon residents of the border states. "[5]

5. This Article provides a mechanism whereby the representatives of those most likely to be affected may participate in and contribute to the decision-making process" The Commission is instructed to encourage the presentation of written statements, proposals and studies-even complaints; it is expected to provide an "open forum" when interest runs high or the matter is complex or sensitive. Individuals, officials, organizations, and firms may ask to be heard, by written submission and orally at scheduled hearings, workshops and technical meetings" This approach gives direct access to the Commission or, in the case of workshops and technical meetings, to its staff preparing reports to the Commission. Such established opportunity equips, perhaps for the first time, municipal, state, regional and other leaders, for example Governors, State Engineers and Mayors with a legitimate and proper forum for advancing their views and lodging their grievances.

6. The term "all persons professing interest" is intentionally phrased broadly so as to comprehend not only governmental entities, such as cities, counties, and states, but also nongovernmental organizations and individuals. Governmental entities would include a variety of units such as administrative agencies, irrigation districts, and planning agencies. Non-governmental organizations would include a number of organizations, which might be interested such as water user associations and environmental groups. Finally, individuals include those with a stake in the outcome of binational measures, such as major water users and those causing serious pollution (Paragraph I).

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[1] Dworsky, supra note 48, at. 335.

[2] Sadler, supra note, 38, at 375.

[3] Mumme. Regional Powers in National Diplomacy: The Case of the U.S. Section of the International Boundary and Water Commission. 14 Publius 115 (1984).

[4] Ingram, State Government Officials. Role in the U. S.-Mexico Transboundary Resource Issues. the States and 28 Nat. Res. J. 431,443 (1988).

[5] Id. at 432.

7. The Commission is required to invite and consider written submissions when considering actions such as the declaration of a Transboundary Groundwater Conservation area or Drought Alert. The Commission is also given the option of scheduling public hearings if, in its discretion, it "deems the public interest warrants" (Paragraphs 1, 2 and 3).

8. In addition, the opportunity is provided for any person professing an interest to request a hearing or the issuance by the Commission of an invitation for written submissions or comments in order to bring to the attention of the Commission matters of citizen or governmental concern. Petitioners are also permitted to advocate specific measures or declarations. For instance, there might be menacing situations of draw down of groundwater supplies, or of contamination in a recharge area; interested persons could act on their concern by petitioning the Commission regarding the desirability of declaring a Transboundary Groundwater Conservation Area. In this way problem areas might first be brought to the attention of the Commission, offering at the same time the opportunity to strengthen the relationships between local governments and groups and the Commission. In short, such access would help the Commission to fulfill its responsibilities, as well as facilitate the marshalling of public support for needed action by providing a place to seek relief in addition to that, which might or might not be offered from distant national capitals (Paragraph 4).

9. Public Health Emergencies by definition are likely to require the Commission to act with all possible speed (Article IX). This need to act "urgently" should not be unduly encumbered; thus, the requirements of Paragraph 1 of Article XIII are not made applicable to the declaration of Public Health Emergencies. Nonetheless, individuals, local governments, and others can petition the Commission to "invite statements" or "to schedule a hearing" if there is a concern about perceived, actual or potential public health emergencies, or about the need to review or reconsider Declarations of Public Health Emergencies already in force, or other actions such as extending the period of the emergency (Paragraph4).

10. The provision for workshops, technical meetings and briefing sessions (Paragraph 5), authorizes subsidiary means for the Commission to inform itself of conditions and apprehensions, and to apprise local officials, technical people and the public of its findings and plans and measures under consideration. The UC has made considerable use of "hearings, workshops and other consultative devices for involving the various publics affected by or interested in the issue at stake."[1] This has occurred in the context of "sub national micro-diplomacy" in which "[r]egional consultation and cooperation of non-central governments" has increased

[1] Sadler, supra note 38, at 371. See also. Sinclair. The Public Hearing as a Participatory act Device: An Evaluation of IJC Experience, in Public Participation In Planning 105-22 (W. Sewel1 & J. Coppock eds. 1977); Bonner, The International Joint Commission in Public Participation, in 2 Involvement & The Environment 330-39 (B. Sadler ed. 1979).

considerably.[1] At the same time, non-governmental organizations, in particular those formed in and for the region, have grown in importance, and are playing a greater "role as catalysts in the process of bilateral cooperation…"[2]

ARTICLE XIV
EXISTING RIGHTS AND OBLIGATIONS

The rights and obligations of the Parties as set forth in prior agreements between the Parties shall not be permanently altered by this Agreement or any measures taken hereunder.

COMMENT:

1. Governments do not lightly alter or unsettle their prior treaties, in which the balancing of rights and duties, including allocations of water, were carefully, even arduously negotiated. Since this Agreement would permit certain modification of the existing regime under special conditions only, and for limited times and purposes, it was deemed useful to insert this clarifying proviso.

2. Significant drawdown of groundwater will affect negatively the base flow of surface waters (where these are present), often also impairing surface water quality. Elevation of the water table, induced by man or nature, can adversely affect soils and create drainage problems for mining and agriculture generally. Such interference with, or changes in, the hydrologic cycle may require conjunctive use, transfers and exchanges of surface and groundwater in order that transboundary aquifers and their waters, as well as surface waters, may be satisfactorily managed. Measures to preserve or improve groundwater quality may also require such conjunctive, transfer or exchange actions, which migh t involve, for the time being, shifting away from previously arrived at national or international allocations. Only by such temporary adjustments in some circumstances will it be possible to achieve the Parties' objectives.[3]

3. Groundwater and surface water are physically interrelated as integral parts of the hydrologic cycle. "[4]

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[1] Duchacek, Commentary. 2 Borderlines I, 5 (1985).

[2] Id.: see also Fritz, Montana' s Transboundary Water Objectives. in Border Waters, Proceedings " of a 1986 Conference 4.1 (1987) (Published by 49th Paral1el Institute for Canadian-American Relations); MacLeod, The Saskatchewan Experience, Id. at 31; Faby, North Dakota's Cooperative Experience, Id. at 33.

[3] See, inter alia, Instituto de Economia, Legislacion y Administration del Agua, Uso Conjunto De Aguas Superficiales Y Subterraneas (Mendoza, Argenlina .\976) esp. 57- 74 (Adecuacion de normas juridicas en funcion del uso conjunto de aguas superficiales y subterraneas. by J. Lopez) 77-96 (Administration de los recursos hidricos superficiales y subterraneas. Facultades reglamentarias, by E. Boccia).

[4] Cappaert v. U.S. 426 U.S. 128,142 (1976).

ARTICLE XV
ACCOMMODATION OF DIFFERENCES

1. The Commission shall expend its best efforts to resolve differences within the Commission with respect to the facts and circumstances of a situation within the purview of this Agreement. Failure to resolve such differences within six (6) months at the technical level of the Commission shall result in the submission of the differences(s), together with the entire record, to the Governments for resolution by consultation.

2. If after good faith consultations during a period of twelve (12) months the Governments are unable to reach an accommodation of a difference or differences between them concerning the facts and circumstances of a situation within the purview of this Agreement, or with respect to which the Commission has been unable to reach agreement,

a. any Government is entitled to invoke this Article to the effect that a commission of inquiry be appointed and charged with a full and impartial study for the purpose of verification of the facts of the situation,.

b. the Governments shall appoint and instruct the commissioner(s), and defray the expenses of such commissions equally, unless otherwise agreed; and

c. in the event the Governments fail to agree upon the implementation of this Paragraph within six (6) months from the date of its formal invocation, the , at the request of any Government shall, after consultation with each Government, appoint the commissioner(s), instruct the same, and apportion the expenses of the commission, as may be required to render the commission operational.

3. A commission of inquiry appointed under this Article shall render a report to the Governments within the terms of its instructions and on the basis of independent and detailed examination of the data and information made available to it by the Governments and the Commission, and may request such additional data and information as the commission of inquiry deems significant for its deliberations and findings.

4. On the basis of the report of a commission of inquiry, the Parties undertake promptly to enter into consultations for the purpose of reaching an agreed accommodation of the difference(s).

5. The Commission shall expend its best efforts to resolve differences within the Commission with respect to the interpretation of this Agreement, of any declaration, plan or prescribed measure, or of any other relevant document referral, request or decision. Failure to resolve such differences within six (6) months by the Commission shall result in the submission of such difference(s), together with the record of deliberations, to the Governments for resolution by consultation.

6. Should the Governments, after six (6) months of consultations fail to agree upon a questioned interpretation submitted to them by the Commission, pursuant to

Paragraph 5, or that has otherwise arisen, including with respect to the validity or interpretation of any binding decision by the Commission, the provisions of Article XVI of this Agreement shall apply.

COMMENT:

1. Disagreements, which in the normal course of deliberations are bound to occur when a joint commission is entrusted with meaningful tasks, are of two kinds: questions of fact-about conditions in the field or the effectiveness of implementation measures, for example, and questions of law-interpretation of a clause in the Agreement, of a provision in a declaration or plan, or of a joint or unilateral communication from the Governments, for example. It is important that all such disagreements first be given special, careful consideration by the Commission itself, possibly under a separate agenda item of a subsequent meeting devoted to differences that have arisen. The first 4 paragraphs of the Article concern the procedures where there is lack of agreement on the facts, or when these are not clear or fully developed. The remainder of the Article concerns lack of agreement with respect to interpretation of a document.

2. Caldwel in his study of the Garrison Diversion dispute between the U .S. and Canada suggests "To the extent the resolution of the Garrison controversy has been approached, the primary factor has been scientific information. If future controversies, such as Garrison are to be avoided, an agreed upon system or arrangement for conflict resolution using agreed upon criteria for validated evidence will be necessary. "[1]

3. Maxwel Cohen, former Chairman of the International Joint Commission, U .S.-Canada, suggested five basic rules for avoiding conflict between the two countries. They include ".(2) Do not prolong by unilateral rhetoric any disagreement over basic facts-set up joint fact finding instruments as early as possible to obtain agreement on disputed facts. "[2]

4. Commissioner Herrera, then Mexican Commissioner, U.S.-Mexico International Boundary and Water Commission, has aptly said: "The first phase of the solution of a controversy is that of defining the problem; the more clearly the better. Sometimes incomplete knowledge of a problem leads to an equally incomplete response. ..."[3] Before disagreements in the field or within the commission on the meaning of the data, the needed responses to the situation, or the interpretation of the agreement "harden" into formal disputes, there is a need for "internal" discussion at the technical and commission levels. Phased machinery for thorough internal discussion is institutionalized in this Article. Such prior

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[1] Caldwell, supra note 29. at 859.

[2] M. Cohen. The Patterns of Settlement-Canada. The United States and the International Joint Commission (Nov. 9. 1976). as restated by Carroll in Water Resources Management as an issue in Environmental Diplomacy. 26 Nat. Res. J. 207-18 (1976).

[3] D. Herrera Jordan. The United States-Mexican International Boundary and Water Commission ("Bilateral Commissions and International Legal Methods and Legal Adjustments..). in Amer. Soc. of Int.1 L., Proceedings of the 68th Annual Meeting 1974.226 (1975).

efforts at accommodation of differences have long been regarded as highly desirable, because of the frequently vital need to continue or modify a project or program, or to take urgent action.[1]

5. The staging of discussions through several levels may make resolution of the disagreement possible by the operating people having full technical understanding of the matter. These discussions may take advantage of special studies, data analysis, position papers and comparison of proposed alternatives. The question would be referred to the Governments only if the Commission should be unable to reach an agreed accommodation. In critical cases, the Commission is certainly free to refer the difference to the Governments (and possibly with a recommendation that a commission of inquiry be appointed) earlier than the six-month maximum period set forth in the Article, should it become obvious that agreement internally is out of the question (Paragraph I).

6. After such a referral to the Governments, the Agreement would require the Governments to enter into consultations; at this stage the matter is not yet regarded formally as a dispute. If in the end the consultations are not successful, the creation of a commission of inquiry can be precipitated at the request of any Government (Paragraphs 2, 3 and 4). This approach was incorporated in Judge Schwebel's proposals to the International Law Commission:

> When an accommodation is not achieved at the operating level, higher review must take place. This review can still be by water resources professionals, such as the members, or deputies, of the system States' international watercourse commission. Such arrangements are not uncommon in current system State practice.
>
> An additional “professional" review may be obtained by reference of the question to a technical commission of inquiry... As a further device to forestall the matter's hardening into a formal dispute between the parties, one or more additional “echelons" of review may be built into the system States' arrangements, such as a diplomatic commission specially constituted for the purpose. System States have, in particular agreements, employed a variety of accommodation mechanisms. Belgium and Germany combined diplomatic and technical representation in one joint administrative commission for the purpose of accommodating

[1] See esp., Management of International Water Resources: Institutional and Legal Aspects, 144-73 U.N. pub. Sales No. E.75.II.A.2. Natural Resources/Water Ser. No. 1 (by R. Hayton. New York, 1975), and examples and works there cited.

> differences. Such a separate forum could be designed to function prior to the traditional “referral to the Governments," which may mean that the matter will then become a formal dispute.[1]

7. The experienced specialists in the field are unanimous that, where disagreements arise, recourse must first be had to consultations among the knowledgeable professionals. As one such specialist has said:

> [I]ndeed, the parties should always seek to accommodate their differences given the complicated and obscure nature of groundwater. It is often difficult to know who might be the winner, given parity in technological capabilities. Water is one resource that rarely has a substitute. Therefore, the goal should be accommodation of differences in order to ensure sustainable and equitable utilization. The party that seeks a zero-sum win at one point may require the water at a later date.[2]

8. The Article's second paragraph empowers the Government of any Party to demand a commission of inquiry after 12 months of unsuccessful consultations. Nevertheless, where the situation is urgent, the Governments collectively are free to agree to appoint such a commission at any time.

9. As with the fact-verification aspect (Paragraphs 1-4 of the Article), a separate opportunity and a reasonable time are provided when lack of agreement relates to any difference over legal interpretation. Extraordinary attempts at resolution within the Commission are mandated. Whenever agreement is not reached within 6 months, the Commission is obliged to place the matter in the hands of the Governments (Paragraph 5). To be sure, if the Commission should conclude that lack of a decision on a question is causing intolerable delays on one or more important projects or programs, and that resolution by the Commission is clearly out of the question, the Agreement does not preclude elevation to the governmental level before the expiry of the six-month period.

10. Once the Commission has passed such questions "upstairs," the Governments are to enter into consultations for the purpose of seeking an accommodation. Other issues of interpretation or validity may well arise between the Parties, which did not come up through the Commission. In these cases, too, the Governments undertake to seek resolution first by direct consultations. Again a six-month "deadline" is set forth, after which-absent agreement to prolong the consultations-the Parties have agreed to treat the matter under the Resolution of Disputes Article (Paragraph 6).

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[1] ILC Third Report, supra note 27, at 324.

[2] Memo from C. Okidi toAlbert Utton 7 (Mar. 1988) (The Bellagio Draft, unpublished memo., Univ. of Nairobi). Emphasis in the original.

11. The relatively "tight" scheduling of these periods of deliberation and consultation proceeds from the assumption that transboundary groundwater problems require, as often as not, timely action. Unaccommodated differences typica1ly mean inability to move forward with respect to a serious, deteriorating situation, or the suspension in whole or in part of a badly needed project already under way. The "price "-social as well as economic and financial--<>f failure to remove obstacles to implementation schemes under the Agreement can be very high indeed. Thus, the Parties have by the terms of these two Articles XV and XVI undertaken to give prompt political-level attention to issues impairing the accomplishment of their agreed purposes (Art. II).

ARTICLE XVI

RESOLUTION OF DISPUTES

1. *If the consultations called for under Article XV do not achieve an agreed accommodation, the Governments shall promptly enter into formal, direct negotiations for the purpose of resolving the disagreement.*
2. *Should the Governments not achieve agreement after six (6) months of direct negotiations, the Parties shall refer the matter to mediation, œnciliation, arbitration, the International Court of Justice or any other means of peaceful settlement, absent a previously agreed, applicable means of dispute settlement binding upon the Parties.*
3. *In resolving differences and questions affecting the implementation of this Agreement and decisions taken thereunder, the Parties undertake to avoid delay and to facilitate the process of resolution as between themselves and, as appropriate, before any mediator, conciliator, tribunal or other settlement forum, taking into account the importance of timely resolution with respect to critical transboundary groundwater situations.*

COMMENT:

1. Experienced diplomats and natural resources specialists alike know full well that even institutionalized “best efforts" to contain disagreement and to avoid substantial delay may fail. Given the Parties' collective conclusion that the importance of transboundary groundwater problems demands focused and sustained response, provision must be made in the Agreement for the certain and accelerated settlement of intractable differences, if and when necessary. Formal negotiations should immediately take place, once the accommodation echelons have been exhausted. And should negotiations not succeed, prompt resort to apt third-party forums must be in place. This Article articulates the minimum commitment to dispute settlement procedures deemed appropriate in this field. But should the Parties be willing to accept, in the Agreement, binding arbitration, or adjudication by an existing or specially established tribunal, resolution of disputes could be attained with more dispatch. Short of such binding judgment, the Parties might well consider an “automatic" provision at least for bringing mediation or conciliation into play, the results of which after all are not binding on the Parties. An alternative would be this kind of "assistance" clause: “In the event that the Parties after twelve (12) months of negotiations, or attempted negotiations, fail to choose a means of peaceful settlement by agreement, any Party may notify

the who [which] is hereby empowered and requested to act as mediator [aconciliation commission] for the purpose of assisting in the attainment of agreement between [among] the Parties in selecting their means of peaceful settlement. "[1]

2. As provided in this Article, if all efforts at accommodation fail, the traditional steps must be resorted to:

> After "referral to the Governments " of any difference that has not been resolved by the institutional machinery set up by the system States for the handling of their shared water resources affairs, the usual next step is direct negotiation between the parties at the political level. The project or programme at issue may be of such importance that even at this stage it may be prudent for the system States to arrange for some or all operations to continue, pending final resolution of the matter.
>
> Failing settlement by high level negotiation, the parties are, of course, free to take the dispute to the International Court of Justice. The International Court of Justice may in appropriate circumstances indicate provisional measures, which could serve the parties' interests in avoiding delay or disruption of critical water-related activities, or preclude irreversible harm. The parties are also free to refer the matter for adjudication to any other appropriate tribunal.
>
> The fundamental requirement, in accordance with the Charter and the rules of contemporary international law, is settlement by peaceful means. In addition to resolution by means of negotiation, enquiry and adjudication, the parties may choose, among other peaceful means, conciliation, arbitration, or the assistance of regional agencies or arrailgements.[2]

3. The high cost of delay in these matters is often emphasized:

> Speedy resolution of conflicts or settlement of disputes in international water matters is a critical matter. Water is critical to life and for that reason a delay by one of the parties may leave the other(s) no option but to proceed. And once the construction or infrastructures are in place (expensive as they often are) it is difficult for the situation to be reversed. Moreover, once such disagreements flare up they are notoriously difficult to resolve and a military

[1] For the full range of possible institutional arrangements, see Management of International Water Resources, supra note 85.

[2] ILC Third Report, supra note 27, at 325.

situation may easily ensue, even though it might be a war where there would be losers and no winners. [1]

4. Preference for negotiated settlement of disputes of this kind was expressed by the "Rau Commission" concerning Indus Basin waters (Sind-Punjab): "The most satisfactory settlement of disputes of this kind is by agreement, the parties adopting the same technical solution of each problem, as if they were a single unified community undivided by political or administrative frontiers."[2]

ARTICLE XVII
AMENDMENT

This Agreement may be amended by agreement of the Parties.

COMMENT:

This provision is a standard expression of the general international law rule. In the infrequent case of a shared groundwater treaty involving more than, say, three States, an amendment proviso common to multilateral conventions could be employed, permitting modification, at least as between the agreeing Parties, by less than unanimity.

ARTICLE XVIII
ENTRY INTO FORCE

This Agreement shall enter into force on the date of the exchange of instruments of ratification [signature by the duly authorized representatives of the Parties] .

COMMENT:

This is another of the usual “final clauses " of international agreements. If the Parties' constitutional processes require separate formal ratification procedures, the exchange of ratifications instruments alternative would be used. Otherwise, the Parties can bring the agreement into force upon signature .

ARTICLE XIX
AUTHENTIC TEXTS

This Agreement has been concluded in two originals, one in the language and one in the language, both being equally authentic.

COMMENT:

Years ago the parties to treaties where their languages were different, ordinarily chose one (major diplomatic) language as the authentic version for

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[1] C. Okidi, supra note 87, at 8.

[2] Report of the Indus (Rau) Commission and Printed Proceedings 10 (Simla, 1941); see also Laylin and Bianchi, The Role of Adjudication in international River Disputes. 53 Am. J. Int'l L. 30 (1959); Model Rules for the Constitution of the Conciliation Commission for the Settlement of a Dispute, Annex to Helsinki Rules, supra note 5, at 54-55.

purposes of interpretation, in order to minimize the number of disagreements that might arise over the meaning of terms when expressed in two or more languages. That language frequently was French. Now, however, use of the languages of the parties, particularly with bilateral agreements, has become the norm.

ARTICLE XX
RESERVATIONS AND EXCEPTIONS

Any reservations or exceptions made by one Party upon signature or ratification shall be effective to modify this Agreement only after express acceptance by the other Parties.

COMMENT:

This common final treaty clause would only be used in the event that this agreement were entered into by three or more parties. Any "reservations "of a party in the bilateral setting would be negotiated out or taken care of by side understandings prior to signature.

IN WITNESS WHEREOF, the undersigned Plenipotentiaries, being Duly authorized, have signed this Agreement.

DONE AT ----------, this ---------- day of----------,one thousand nine hundred and ------