

# EQUITABLE UTILIZATION AND THE ALLOCATION OF WATER RIGHTS TO SHARED WATER RESOURCES

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**The opinions expressed in this Article are those of the author and do not necessarily reflect the views of the States and institutions quoted herein nor that of their authorized commentators.**

## Abstract

The purpose of this paper is, based on the Principle of Equitable Utilization, to identify those factors which should be taken into consideration when determining the equitable nature of the rights of Basin States to the water resources of the Basin, to evidence the requirement for an integrated Basin water resources plan against which to measure such factors, and to underline the necessity for Basin States to ensure the efficient enforcement of their share of the integrated Basin water resources plan through an appropriate water rights administration at the national level.

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## I. INTRODUCTION

The principle of Equitable Utilization is enounced as “*Each Basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial use of the waters of an international Drainage Basin*”<sup>1</sup> in which the ‘Drainage Basin’ is defined as ‘*a geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters flowing into a common terminus*’.<sup>2</sup>

Expressed in a different way, it means that each water user has a right, within its own area of jurisdiction, to a reasonable and equitable share in the beneficial utilization of the waters of that part of a hydrologic unit comprised within its area of jurisdiction.

Although framed within the realm of international law, the concept of Equitable Utilization is thus of universal application and, in particular, is to apply at the level of national, provincial and local areas of jurisdiction as well.

Another fundamental innovation brought about with the advent of the principle of Equitable Utilization is that each use of water is no longer apprehended and valued in isolation, but by reference to all uses of the water resources comprised within a specific hydrologic unit.

If, until the mid-1960s, international water resources uses were quantitatively apportioned on a piece-meal basis and national water resources were, and still largely are, the subject of multifarious use-oriented legislations, the drainage basin approach has brought about a basic re-orientation of both international law and national legislations from ‘water management’ to ‘water resources management’.

If the concept of ‘water management’ has historically meant the manipulation of water for specific uses and has led to independent legal regimes governing the protection of water quality (for drinking, recreation, thermal, water supply and sewerage, irrigation and industrial uses, for instance) and the development of isolated water-based projects (wells, dams, canals and other water-based structures) for single- or multi-purpose uses, the concept of ‘water resources management’ includes the comprehensive protection, development and utilization of the whole of a given body of water, surface and underground, constituting one single hydrologic unit.

Whether called ‘rational’ or ‘integrated’, the concept of water resources management embraces the ‘conjunctive use’ of surface and underground water resources, the control of their quality and harmful effects, their sustainable development for multi-purpose beneficial utilization and the administration of corresponding use rights.

As to the expression of ‘sustainable’ development, it is meant at putting an end to the historical conflict opposing ‘development versus conservation’ issuing from the recent ecological frenzy brought about by the environmentalists. It emanates from the ‘sustained yield’ principle developed since times immemorial by the foresters and according to which ‘no more trees should be cut within a given forest than Mother Nature will replace over a given period of time’. First imported into the water management field in respect of the

exploitation of underground waters, this expression is now being applied to the development element of the water resources management concept in the sense that development is to take into consideration its present and future ecological impacts over a certain period of time. It is assumed that the duration of this time element corresponds to the capacity of Mother Nature to absorb such impacts and eventually restore her natural environment.<sup>3</sup>

As has been widely remarked, however, the principle of Equitable Utilization remains absent of a workable definition of what makes a utilization 'reasonable and equitable'. Although what is a reasonable and equitable share '*is to be determined in the light of all relevant factors in each particular case*'<sup>4</sup> and despite the availability of a non-exhaustive list of those relevant factors,<sup>5</sup> it remains that the term of reference against which to measure the relevance of such factors is apparently missing.<sup>6</sup>

It is the purpose of this paper to suggest that such a term of reference is to be engineered in each case in the form of a 'Water Resources Management Plan' conceived on the basis of the above concepts and principles.

## **II. THE CONCEPT OF WATER RESOURCES MANAGEMENT**

### **1. The Water Resources Management Function**

The management function implies an object and a manager. If water resources are to be managed, the resource has to be defined and quantitatively as well as qualitatively measured. To define a quantity of water flowing in a stream requires abstraction. Surface water contained in a reservoir or abstracted in a cup can be identified and measured. Traditional customary laws and practices<sup>7</sup> teach us that the water contained in a shallow well can be appropriated because it can be measured 'provided the bottom of the well can be seen'. Similarly, the water resources contained within a drainage basin or other hydrologic unit can be defined and measured. The object of the water resources management function therefore necessarily needs to be apprehended by the drainage basin or other hydrologic unit such as a tributary basin or an irrigation area starting from the main intake or diversion.

The purpose of the water resources management function is to answer such questions as what water, in what quantity and what quality, does it need protection or quality restoration, does it cause harmful effects and how to mitigate or abate such effects, can it be developed and what would be the ecological consequences, are there other uses to be satisfied over time, how is the resource currently used, are current uses efficient and equitable, how can such uses be controlled ?

To take but a trivial illustration as close as possible to water, a banker manages liquidities : cash in, cash out, cash balance, deposits, savings, reserves, investments, yields, disbursements, cost accounting, loans, rate fixing and the like. Water resources, as the wealth of the community, require but the same kind of manager, or trustee.

Water resources within the drainage basin need to be inventoried, quantitatively and qualitatively; the water demand needs to be assessed, and no more than available water may be allocated under pain of bankruptcy of the water bank. Water resources must be protected, quantitatively and qualitatively; they must be developed and used more efficiently in order to increase their availability. Water resources must be used in the best possible way, both quantitatively and qualitatively, in order to benefit all users equitably. As is now recognized, surface and underground waters must be used conjunctively and the safe yield of underground water resources must be protected. Water resources must be managed in such a way as to respect the environment and, notwithstanding the assertions of the environmentalists, all natural resources, including man, must be managed in a way respectful of the environment because there is nothing on earth called the 'Environment' that is in any way manageable ! May be different environments or sets of environments or ecological units, but no 'Environment' as such.

Therefore, 'water resources management' should be construed as the sum total of activities that will ensure 'the conservation, development and utilization of the water resources of the basin or other hydrologic unit for the benefit of the users' community'.<sup>8</sup>

Under such a principle, there is no room for 'optimum' conservation, development or use as the optimization of one element would by definition have to be at the expense of the others. The criterion instead should be 'balanced' conservation, development and utilization which, in the legal realm, is expressed as 'equitable'.

And, as with the definition of the drainage basin, the water resources management concept is applicable to the waters of both international and internal basins, let alone captured aquifers or fossil waters and, who knows, may be icebergs one day !

## **2. The Water Resources Management Plan**

The recognition of such principles as those of the 'community interest' and of 'equitable utilization' no doubt constitute the achievement of the 20<sup>th</sup> Century in water resources legal doctrine, if not in state practice. In promoting such principles and in setting-up mechanisms for the administration of international water resources and for the settlement of disputes, the Helsinki Rules omitted however to institutionalize the necessary instrument allowing to convert the still subjective concept of 'equitable utilization' into an objective term of reference for water resources management : 'the water resources management plan'.<sup>9</sup>

There is no need here to elaborate on the planning function and its intrinsic technical, economic and social parameters which have been amply developed by the water resources engineer, economist and planner. What needs to be stressed, however, is that water resources management will always remain a highly political affair in the hands of sovereign states at the international level and of autonomous governments at the national level and that the only way to limit political intolerance in water affairs is by obliging the politicians to take their decisions based on the evidence of bare, technical facts, economic realities and social imperatives.<sup>10</sup>

As has been seen before, States sharing the same basin need one 'banker' to manage their common water resources, as do individual governments responsible for the water resources of the national community. And like the banker, the water resources manager has to establish the balance sheet of the available water resources, i.e., the quantitative and qualitative inventory of available water resources, the quantitative and qualitative inventory of existing water uses, and the quantitative and qualitative inventory of the water demand in order to compile the balance, which may be positive or negative, of available waters for an equitable allocation of, not the water itself, but corresponding water use rights.<sup>11</sup>

In addition to institutionalizing the concept of the drainage basin and the principle of equitable utilization, international agreements and national legislations need to institutionalize the concept of the water resources management plan as the instrument against which to measure all those specific factors making each individual allocation of water, water utilization and water use equitable.

### **III. THE ORGANIZATIONAL STRUCTURE**

If the water resources planning exercise is essentially the same at the international drainage basin and at the national level, the respective political environment calls for substantial adaptation in the organizational structure correspondingly required.

At the international level, the institutionalization of the 'water resources banker' function is rather simple. It takes the form of a joint institution entrusted with the planning function and, subsequently, vested with the power to coordinate and control plan implementation. Endowed with a permanent executive function, this institution operates by virtue of the policy decisions of its governing body manned by the delegated representatives of the Basin States. The planning exercise is conducted at the level of the drainage basin irrespective of the political boundaries of the respective Basin States. Once a particular plan or project is approved, however, its implementation by the Basin States concerned necessarily falls back within the respective sovereign territorial jurisdiction of each Basin State.

The situation is apparently much more complex at the national level within which the governing power is either shared or delegated at the national, state or provincial and local levels. Whether a portion of an international drainage basin, a purely national basin or another hydrologic unit, administrative boundaries and individual, often conflicting, prerogatives of the numerous government departments and agencies involved take precedence over the hydrologic reality. There is a national economic development plan, which incorporates the water sector, and a national water resources policy, both of which are imposed upon local governments and implemented by them within their respective areas of jurisdiction. This constitutes the historical top-down approach which systematically ignores the reality of the hydrologic cycle.

It should be remembered, however, that local water users communities have been managing their water resources since time immemorial in accordance with a regime of customary rules and practices which have proven their worth over time. It must be

recognized that these communities hold a considerable know-how based on such traditional principles and concepts as the community interest in water resources which may not be appropriated, the seasonal cropping and related irrigation water allocation plan, the precarious nature of water rights, the community sharing in waterworks construction and maintenance, and the institution of the 'water master' with his executive and judicial powers.

Living examples are the Arab inspired customary water users associations of the Vega de Valencia in Spain and the 'Subak' system of water management in Hindu Bali, both of which have inspired the new water legislations of Christian Spain and Moslem Indonesia.<sup>12</sup>

It is strongly suggested that States wishing to reform their water legislation do first undertake a study of the customary water resources management systems present and operating within their rural areas and try and import their traditional concepts and principles into the new water legislation. The advantage of this bottom-up approach will be the recognition at the national level of such concepts and principles which the local populations concerned will then recognize and observe, contrary to the current situation of fact wherein new national legislations are systematically ignored or rejected by the local users who do not understand them.

In Bali, for instance, the 'Subak' is a hydrologic unit consisting in an intake or diversion from a main irrigation canal feeding secondary and tertiary canals and feeders irrigating a specific set of agricultural plots of land cultivated by their farmers themselves organized in a water users' association. Although the 'Subak' comprises a separate canal conveying water to the home village or villages of the farmers for village sewerage purposes, the 'Subak' administration is totally independent of the village administration. A cropping plan is devised for each season and the water allocated to each plot based on the water requirements of the crop being grown during that particular season. Cropping patterns and corresponding water allocations rotate in each season. Water is allocated in accordance with a very elaborate system of water turns based on time and space requirements. Farmers contribute their labour in waterwork construction and maintenance and a portion of their crop to cover incidental expenses. Water is sacred and cannot be appropriated. Using canals and feeders for sanitary purposes is an offence. Drinking water in the villages is from shallow wells.

This system is run by a Water Master elected by the community of irrigators, usually from among the farmers cultivating plots located at the end of the irrigation network so as to make sure that water will flow to the last irrigated plot. The Water Master is assisted by a crew of helpers and criers. He is in charge of the implementation of the cultivation plan approved by the association and settles water disputes. In compensation, he is relieved of his personal labour contribution obligation.

Similar customary systems are present in the traditional communities of most countries of the world. These can easily be codified and can serve as examples in the framing of a modern water legislation.

Indeed, at the national level, water resources management requires a 'national water master' assisted by individual basin, sub-basin and local water masters. There is a need for each hydrologic unit to have a water resources management plan and for all these plans to be aggregated and compiled into the national water resources management plan which, itself, constitutes the water sector of the national economic development plan. The national water resources planning exercise therefore requires a permanent two way feed-back from the local to the national level and back from the national to the local level.

The new organizational structure required is that of the water masters. At the national level, it should be a permanent planning, coordination and plan implementation control institution operating under the authority of the Cabinet. All government departments have responsibilities and competences in the water resources field. These should be carefully maintained. These departments exercise the executive power and should continue to do so, each one in its field of responsibility, but no longer in isolation. They should participate in the planning exercise and, once a plan or project has been approved, they should implement such a plan or project to the extent of their respective competences and prerogatives, but under the coordination and control of the national water master. Where feasible, the national water master should be flanked by a consultative body made out of the representatives of all government departments concerned and of the national economic and social sectors so as to constitute some kind of 'water parliament' whose functions are participation and communication in national water affairs.

The same structure should be institutionalized at the state or provincial and at the basin or other hydrologic unit level. Care should be had for ascertaining that all corresponding executive and administrative authorities do participate in the joint planning exercise and are entrusted with plan implementation functions each within its own fields of competence and respective areas of jurisdiction. In such a way, there can be no conflict between the natural boundaries of the various hydrologic units and those delimiting the areas of jurisdiction of the various executive and administrative units of local government. In addition, the institutionalization of a 'water parliament' at each such levels will ensure people's participation and informed cooperation.

#### **IV. THE WATER RIGHTS ADMINISTRATION**

If, at the international drainage basin level, the water resources management plan will allow for the determination of the reasonable and equitable share of each Basin State in the waters of the basin, actual water resources utilizations do effectively take place at the national level. And if the share of each Basin State in the water resources of the drainage basin is to remain reasonable and equitable over time, it is necessarily required that each Basin State take appropriate measures to ascertain that, within its national territory, all water utilizations conform to corresponding terms and conditions.<sup>13</sup>

This function is that of the administration of water rights which ought to be exercised by the national and basin - or other hydrologic unit - water resources institutions along with their inventory, planning and coordination functions. This is however the only function for which the said water resources institutions should have full executive power.

As has been seen above, individual water rights should no longer have a permanent character. Irrespective of the territorial sovereignty of the Basin States or of the landownership rights of the individual users, the water resources of the drainage basin constitute a 'shared international natural resource' of which the Basin institution is the trustee on behalf of the Basin States community as much as the respective national governments are the trustees of the national water resources on behalf of the national community.

But water rights are to be protected and security of tenure must be achieved if water users are to enjoy economic security for their investments in the water sector. The only way to achieve this objective is by establishing a contractual relationship between the trustee, i.e., the various water resources institutions, and the water users depending on the waters of the corresponding basin, sub-basin or other hydrologic unit. Depending on the type and size of the various uses, this contract can take the form of a simple authorization, of a permit or of a concession. Minor in-stream uses, diversions and non-power driven abstractions for drinking, animal and orchard watering should evidently be left free for all, subject to the prevailing land tenure systems. All uses having or likely to have an impact on the water resource are however to be controlled.

Thanks to the inventories of the water resource and of existing uses, of the water demand and of prospective development projects identified in each water resources management plan, it becomes possible for each water resources institution to grant each user, or category of users, an authorization, a permit or a concession containing all the required terms and conditions of use based upon the consideration of all the relevant factors making each such use a reasonable and equitable utilization.

Each water use so granted will remain contractually protected as long as the user conforms his use to the granted terms and conditions. In addition, each such water use contract should provide for the possibility of the holder to have recourse before the higher water resources institution and to the competent courts of law should his right be abused or interfered with in any other way.

At the same time, the water resources institution having granted such authorizations, permits or concessions is to be entitled to vary, modify or terminate granted water rights on the basis of evolving hydrologic, technical, economic and social conditions. Here again, water rights are to be protected by a system of substitution in water supply, of compensation or of indemnification in order to equalize the new use or the loss of the former use with the benefits enjoyed from the past use.

The task may seem overly burdened if not impossible. In practice, however, there is no need for the water resources institution to directly control each and every use of water. In urban areas, one single main concession is granted to the municipality or water supply and sewerage corporation. The water resources institution needs to control the main intake of the water supply and the point of effluent discharge. The municipalities and concessionaire corporations do already control the users of their water supply and sewerage networks. The same applies to agricultural uses of water where one concession is granted to water users associations from the point of diversion while these associations regulate and control the

water use of their respective members. The same holds true of those organizations managing thermal and recreational water uses, timber floating and waterborne transport.

Hydropower uses, because they require dams and reservoirs, and industrial uses because of their substantial chemical pollution, do require individual treatment. But their large volume of water use make it possible to subject these to the concession regime.

The control of groundwater resources is however more delicate as not only uses themselves but groundwater exploration on the one hand, and extraction, on the other hand, require particular treatment. Drillers should have a capacity license, groundwater exploration should yield hydrogeological inventory data and the installation of piezometers where water is found, while the extraction capacity should be controlled and the pumps calibrated. The operation of shallow- and deep-wells should be differentiated as should the use of phreatic, deep and confined aquifers.<sup>14</sup>

As a conclusion to this brief analysis of the premises on which the principle of Equitable Utilization has been framed and of its far reaching implications on the legal regime of both international water resources law and national water legislations, it may be upheld that the water resources management plan can usefully serve as the term of reference against which all relevant factors determining the equitable nature of the allocation of internationally shared water resources and of the recognition of every single water use may be reasonable measured.

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## Notes

1. Article IV of the 1966 Helsinki Rules of the International Law Associations, see : **International Law Association Rules on International Water Resources**, edited by Slavko Bogdanovic, Yugoslav Association for Water Law, Yugoslav Branch of the International Law Association in Novi Sad, and the European Centre for Peace and Development (ECPD) in Belgrade, Prometej, Novi Sad, Yugoslavia, 1999, p. 206.
2. Article II of the 1966 Helsinki Rules of the International Law Associations, see : **International Law Association Rules on International Water Resources**, op. cit., p. 206.
3. For an interesting study of the origin and meaning of the ‘sustained development’ concept, see : **Le Partenariat euro-méditerranéen et la Tunisie**, by Slim Laghmani, in : **Sustainable Development and Management of Water Resources: a Legal Framework for the Mediterranean**, edited by Sergio Marchisio, Gianfranco Tambourelli and Liana Peccoraro, Institute for Legal Studies on the International Community – CNR, Mediterranean Sustainable Development Law – MESDEL, Rome, Italy, 1999, pp. 25-29.
4. Article V.1., of the 1966 Helsinki Rules of the International Law Associations, see : **International Law Association Rules on International Water Resources**, op. cit., p. 206.
5. Ibidem, Article V.2., pp. 206 & 208.
6. ‘*Although the theory of “equitable share” overcomes the two extreme doctrines of absolute territorial sovereignty and integrity, it does not provide a patent remedy to all water disputes. The mentioned factors to be considered in defining ‘equity’ remain in part conflicting, and the agreements do not state relative weights or priorities among them.*’, quoted from **Water Disputes in the Jordan Basin Region and their Role in the Resolution of the Arab-Israeli Conflict**, Environment and Conflicts Project (ENCOP) Occasional Paper No. 13, by Stephan Libiszewski, Center for Security Studies and Conflict Research, Swiss Federal Institute of Technology, Zürich, Switzerland and Swiss Peace Foundation, Bern, Switzerland, August 1995, p. 70.
7. See in particular : **Principles of Water Law and Administration, National and International**, by Dante A. Caponera, A.A. Balkema, Rotterdam, Brookfield, 1992, pp. 61-62.
8. ‘*The concept of the integrated approach to water resource management focuses on giving due consideration to technical, economic, social and engineering requirements during the planning of water resources development programs, as well as implementing inter-related activities in an efficient, integrated and comprehensive manner. It also calls for setting priorities that meet social expectations and the availability of financial resources. This, integrated water resources management implies an approach that is interactive, flexible and dynamic in the areas of policy*

*planning, analysis and strategy implementation.*’, quoted from **Updating the Assessment of Water Resources in ESCWA Member Countries**, E/ESCWA/ENR/1999/13, 12 October 1999, United Nations, New York, 1999, p.55; and ‘*The fragmented, supply-oriented approach to water development must give way to integrated water management with emphasis on a partnership of water suppliers and water users and on the conservation both of quantity and quality.*’, quoted from: **From Scarcity to Security – Averting a Water Crisis in the Middle East and North Africa**, IBRD, Washington D.C., 1996., pp. 4-5 .

9. ‘*An integrated approach calls for planning to be carried out at the basin and national levels*’, quoted from **Updating the Assessment of Water Resources in ESCWA Member Countries**, op. cit., p. 56. See in particular a methodological approach to water resources planning in : **Transboundary Water Resources in the ESCWA Region – Utilization, Management and Cooperation**, E/ESCWA/ENR/1997/7, 10 September 1997, United Nations, New York, 1998, B. Methodology for Water Sector Planning, pp. 8-12.
10. ‘*In the current Middle East peace process Israel negotiates with each of its immediate neighbours separately. It is true that this was a pre-condition of the Jewish State to consenting to the Madrid opening conference, since it did not want to find itself alone against several opponents. But it also corresponds to the differing interests manifest in each track of the conflict. This holds true for both the political core issues and water-related disputes. It is a central issue of this paper that, although all bilateral trials of the conflict deal in principle with distribution of shared resources, the relative weight of water disputes and their interconnections with traditional concerns – political and territorial – are quite different within each.*’, quoted from **Water Disputes in the Jordan Basin Region and their Role in the Resolution of the Arab-Israeli Conflict**, op. cit., p. 36.
11. For an interesting practical experience in basin planning see : Water Resources Management in Spain, by Antonio Fanlo Loras, published in : *Sustainable Development and Management of Water Resources: a Legal Framework for the Mediterranean*, op. cit., pp. 148-167.
12. See in particular : **Principles of Water Law and Administration, National and International**, op. cit., Islamic customary water administration, Chapter 5.4, pp. 73-74, and Water law principles in the Hindu *Subak* system of Bali, Chapter 2.6, pp. 18-19 & Chapter 5.8, pp. 89-94; and **Water Resources Management in Spain**, op. cit., pp. 148-167 and pp. 236-243. For an example of the integration of traditional water management practices in Western modern water law, see : **Water Management Legislation and Administration in Selected Mediterranean Countries**, by Stefano Burchi, in : *Sustainable Development and Management of Water Resources: a Legal Framework for the Mediterranean*, op. cit., pp. 119-128.
13. For a detailed discussion, see : **Principles of Water Law and Administration, National and International**, op. cit., Chapter 9, National Water Resources Administration, pp. 169-182 and Chapter 12, International Water Resources Administration, pp. 229-246.

14. For a detailed analysis on The legal and Institutional Aspects of Groundwater Mangement, see : Ibidem, Chapter 13, pp. 247-259.
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## **Selected Annotated Bibliography**

1. **Rivers in International Law**, by F.J., Berber, Stevens-Oceania, London & New York, 1959.

*A pre-1966 Helsinki Rules review of international law applicable to international rivers. Prof. Berber has been one of the leading scholars who developed the Helsinki Rules. The ILA Water Resources Committee is in particular indebted to him for his contribution of the Rules on Flood Control and on the Protection of Water Resources and Water Installations in Times of Armed Conflicts.*

2. **The Law of International Drainage Basins**, edited by A.H: Garretson, R.D. Hayton & C.J. Olmstaed, published for the Institute of International Law, New York University School of Law, Oceana Publications, Inc., Dobbs Ferry, New York, 1967, 916 pp.

*A specialized doctrinal treaties on international law as applicable to the drainage basin with case studies on the Columbia, Nile, Plata, Indus and Colorado Drainage Basins.*

3. **International Groundwater Law**, by Ludwik A. Teclaff & Albert E. Utton, Oceana Publications Inc., London, Rome, New York, 1981, 490 pp.

*A compendium of doctrinal articles addressing the origin and development of domestic and international law to the management of underground water resources contributed by such leading scholars, among others, as Dante A. Caponera, Robert Emmet Clark, Robert D. Hayton, Ludwik A. Teclaff and Albert E. Utton.*

4. **Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases By Basin**, Vol. I & II, Legislative Studies Nos. 15 & 34, FAO, Rome, Italy, 1978, 481 pp., and 1984, 332 pp.

*A chronological compilation of some 3700 legal instruments governing international water resources from the early IX<sup>th</sup> century until 1983, with Tables classifying water resources by country and countries by basin.*

*For subsequent treaties, see <http://www.fao.org> selecting “Legal Office” - “FAOLEX” - “International Treaties”, FAO’s electronic legislative data base.*

5. Other FAO Legislative Studies related to water resources law subjects include **A Legal and Institutional Framework for Natural Resources Management** (No. 9), **Legal and Institutional Responses to Growing Water Demand** (No. 14), **The Law of International Water Resources** (No. 23), **International Groundwater Resources Law** (No. 40), **The Freshwater-Maritime Interface: Legal and Institutional Aspects** (No. 46), and **Treaties Concerning the Non-Navigational Uses of International Watercourses – Europe** (No. 50) published between 1975 and 1993.

*A set of studies contributed by such authors, among others, as Julio A. Barberis, Guillermo J. Cano, Dante A. Caponera, and Ludwik Teclaff.*

6. **Principles of Water Law and Administration, National and International**, by Dante A. Caponera, A.A. Balkema, Rotterdam, Brookfield, 1992, 260 pp.

*The bible of the national and international water lawyer. A comprehensive treaties on water law, including a historical and comparative law review of the major customary and codified legal and institutional systems of the World as relate to water resources, and proposing a methodology for the drafting of both national legislation and international treaties together with their respective institutional frameworks and water rights administration procedures.*

*A French translation by Bernard J. Wohlwend has been published under the title : **Les Principes du Droit et de l'Administration des Eaux, Droit interne et Droit international**, par Dante A. Caponera, Editions Johanet, Paris, 2000, 349 pp. (Italian, Spanish and Serbo-Croatian translations are in preparation).*

7. **Transboundary Groundwaters : The Bellagio Draft Treaty**, by Robert D. Hayton and Albert E. Utton, International Transboundary Resources Center, School of Law, University of New Mexico, Albuquerque, NM, USA, November 1992, a bilingual publication, 59 pp. [29, Nat. Res. J., Summer 1989, p.663-722].

*Originally conceived by two eminent members of the ILA Water Resources Committee, and as subsequently revised by different political fora, the Draft Treaty presents the reader with an extensively annotated international framework agreement for the management of international aquifers based on the recent principles of international water law as applied to the US-Mexico border region.*

8. **Water Disputes in the Jordan Basin Region and their Role in the Resolution of the Arab-Israeli Conflict**, Environment and Conflicts Project (ENCOP) Occasional Paper No. 13, by Stephan Libiszewski, Center for Security Studies and Conflict Research, Swiss Federal Institute of Technology, Zürich, Switzerland and Swiss Peace Foundation, Bern, Switzerland, August 1995, 108 pp., available at: <http://www.fsk.ethz.ch/fsk/encop/encop.html>

*A comprehensive analysis of the water resources situation in the Middle East, including both surface and underground, and of the role of water in the historical conflicts within the Region using the Jordan Basin as a case study, together with a*

*detailed review of the peace negotiations since the early 1990s and until the 1994 Jordano-Israeli Peace Treaty. Carries a plea for the integration of diplomacy and water management. Contains a very rich specialized bibliography.*

9. **Application of International Water Law to Transboundary Groundwater Resources, and the Slovak-Hungarian Dispute over Gabčíkovo-Nagymaros**, by Gabriel Ekstein, 19 Suffolk Transnat'l L.R. 67 (1995), 44 pp.

*A thorough examination of international water law as applicable to the physical nexus between surface and underground waters, and of the Slovak-Hungarian Dispute over Gabčíkovo-Nagymaros as a case study.*

Slovakia submitted the dispute to the International Court of Justice in May 1994. In October 1997, the Court pronounced its judgment as follows:

*The Court found both states in breach of their legal obligations, as established in the treaty of 1977, which concerned the construction of dam structures in Slovakia and Hungary for the production of electric power, flood control and improvement of navigation on the Danube. As may be recalled, in 1989 Hungary suspended and subsequently abandoned completion of the project alleging that it entailed grave risks to the Hungarian environment and the water supply of Budapest. Slovakia denied these allegations and insisted that Hungary carry out its treaty obligations. In addition, it carried out an alternative project on its territory, whose operation had adverse effects on Hungary's access to Danube waters.*

In its judgment, the Court found:

*that Hungary was not entitled to suspend and subsequently abandon, in 1989, its part of the works in the dam project, as laid down in the 1977 Treaty between Hungary and Czechoslovakia and related instruments;*

*that Czechoslovakia was entitled to start, in November 1991, preparation of an alternative provisional solution (called "Variant C"), but not to put that solution into operation in October 1992 as a unilateral measure;*

*that Hungary's notification of termination of the 1977 Treaty and related instruments on 19 May 1992 did not legally terminate them (and that they are consequently still in force and govern the relationship between the parties);*

*and that Slovakia, as successor to Czechoslovakia, became party to the 1977 Treaty.*

As to the future conduct, the Court stated that:

*the two parties must negotiate in good faith as to the achievement of the objectives of the 1977 Treaty, and establish a joint operational regime for the dam in Slovak territory, unless they agree otherwise. It further determined that the parties must compensate each other for the damage caused, and that the accounts for the construction and operations of the works must be settled in accordance with the provisions of the Treaty.*

Finally, the Court held that:

*in order to reconcile development with environment protection, the parties "should look afresh at the effects on the environment of the operation of the Gabčíkovo power plant. In particular, they must find a satisfactory solution for the volume of water to be released into the old bed of the Danube and into the side-arms of the river."* (Court's Web Site: <http://www.icj.cij.org>)

In spite of the numerous questions this case raised in respect of transboundary groundwaters and of a much awaited consideration of the applicability of the Helsinki Rules to the case, the Court simply stated that the amount of water to be released should be reconsidered.

(Courtesy communication of Ms Marcella Nanni, Water Law Expert and Alternate Member for Italy, ILA/WRC, Rome, Italy)

10. **Convention on the Law of the Non-Navigational Uses of International Watercourses**, as drafted by the International Law Commission of the United Nations (ILC), text in: United Nations (1997b) Report of the Sixth Committee convening as the Working Group of the Whole (A/51/869), 11 April 1997.

*The Convention was adopted on 21 May 1997 by General Assembly Resolution 51/229 with 106 affirmative votes, 26 abstentions and 3 negative votes (Burundi, China and Turkey), United Nations, 1997a, pp. 7-8. The Convention is subject to ratification.*

11. **International Law Association Rules on International Water Resources**, edited by Slavko Bogdanovic, Yugoslav Association for Water Law, Yugoslav Branch of the International Law Association in Novi Sad, and the European Centre for Peace and Development (ECPD) in Belgrade, Prometej, Novi Sad, Yugoslavia, 1999, a bilingual publication, 277 pp.

*The most up-to-date and trustful publication of the consolidated 1966 Helsinki Rules and Other Rules on International Water Resources Subsequently Adopted by the ILA up to 1996, together with the original commentary.*