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Patterns of Cooperation in International Water Law: Principles and Institutions

INTRODUCTION

Neither the requirements for efficient water resources management nor the technical standards corresponding to the most “reasonable” regime of water resource management are difficult to identify and propose. The real difficulty concerns the political willingness of states to achieve institutionalized cooperation regarding water resources of each international basin. Current experiments in the joint management of international water resources can provide useful insights to states willing to cooperate. Many similarities exist among the agencies established all over the world for the purpose of assuring an equitable share in and the best utilization of those resources. Essential structural features of cooperation include: government participation, principal and subsidiary organs, voting procedure, and functions and powers of the agency. Similarities may develop into established patterns in the course of time, only to be adapted to local conditions. Such patterns, however, only indicate a practice which is not binding on states sharing the same resource: detailed mechanisms and procedures always are the free choice of states. The question of whether states are also free to refuse any sort of cooperative arrangements at all is impossible to definitively answer in the abstract. Any legal obligation regarding water resources which arises out of current international law can only be based on either the general principles and recommendations expressed by and within the United Nations or on the customary principles created by the states concerned within each water basin or system.

IDENTIFICATION OF RESOURCES INVOLVED

Cooperative arrangements, including principles and institutions, are necessary to prevent, mitigate, administer, and solve problems arising from the use of natural resources having transboundary impacts. These arrangements refer to air; atmospheric, surface, and underground water; hydrocarbons; oceans; and bio-resources (flora and fauna). This article is limited to cooperative arrangements relative to water resources.

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In the past, international relations bearing on the use, development, and protection of water resources were restricted mainly to navigation, and the resources involved were frequently identified as "international rivers and lakes"¹ for the purpose of international law. New water uses, and shortages for old uses, however, made it necessary to expand the scope of the law and new definitions were proposed. The subsequent expression "waters of international concern" is too vague, unless water resources are already indicated by reference to a given use, as in the Statute on the Regime of Navigable Waterways annexed to the Barcelona Convention of 1921.² On the contrary, the "drainage basin" doctrine, as formulated by the International Law Association (ILA) in the Helsinki Rules of 1966,³ provides a broader definition which includes all water resources delimited by the geographic notion of "watershed." The drainage basin concept covers not only rivers, lakes, and channels, but also groundwater, canals, small and even seasonal streams, estuaries and, depending on the interests which law is expected to regulate, floods, erosion, flora and fauna. Still more flexible and comprehensive is the definition resulting from the expression "watercourse system" which has been adopted by the International Law Commission of the United Nations in its most recent reports aiming at the codification of the law of non-navigational uses of international waters.⁴ A watercourse system describes the resources shared by a plurality of states, not as a physical or geographic element, but as a system, indicating the connection between these and other components of the resources.

The connecting factor may be natural homogeneity or beneficial use, but it also can be interdependence between users—in our case, between states—in the exploitation, administration, and protection of certain water

1. The expression "international rivers or lakes" was used in article 108 of the Final Act of the Congress of Vienna of June 9, 1815, reprinted in 1 HERTSLETT, A COLLECTION OF TREATIES AND CONVENTIONS BETWEEN GREAT BRITAIN AND FOREIGN POWERS 3, which dealt mainly with the European rivers; in the Treaty of Paris, March 30, 1856, reprinted in 1 HERTSLETT, COMMERCIAL TREATIES 10, which extended to the Danube the principle of freedom of navigation; and the Act of Berlin, February 26, 1885, reprinted in 1 HERTSLETT, COMMERCIAL TREATIES 62, which applied the same principle to the Congo and Niger rivers. The expression is a recurrent feature in water treaties of the nineteenth century. For a discussion of the various expressions, see Caponera, *The Law of International Water Resources*, 23 FAO Legislative Study 4-5 (1980).

2. Barcelona Convention and Statute on the Regime of Navigable Waterways of International Concern, April 20, 1921, arts. 1 and 2, 7 L.N.T.S. 37.

3. INTERNATIONAL LAW ASSOCIATION REPORT OF THE 52d CONFERENCE 484 [hereinafter cited as ILA REPORT].

4. Evensen, *First Report on the Law of Non-Navigational Uses of International Watercourses*, UN DOC. A/CN.4/367 (1983). This also gives an account of previous reports. The term "system" as applied to international watercourses was not new in literature: see Florio, *Sur L'Utilisation des Eaux non Maritimes en Droit International* in FESTSHRIFT BERBER, 151, n.1953 (1973). See also UNITED NATIONS, MANAGEMENT OF INTERNATIONAL WATER RESOURCES: LEGAL AND INSTITUTIONAL ASPECTS 14 (1976).

resources. Thus, if the entire hydrologic cycle becomes relevant, even rain, clouds, frozen water, deep mineral layers of groundwater, coastal sea water, and the oceans may be taken into account to regulate certain uses. A still wider range of natural resources might be included if activities impacting the environment are envisaged. Depending on the interests which have to be regulated, it is the law that identifies the resources within the scope of its rules and principles, according to long-established practice and emerging social needs.

PRINCIPLES AND RULES GENERALLY APPLICABLE

The question of the most appropriate definition of water resources in international relations arises out of several attempts to formulate general rules of international law for the codification and the progressive development of the law of nations. For centuries, national interests in the use, administration, and protection of transboundary water resources had been accommodated by means of agreement with reference to specific, well-defined watercourses and uses.⁵ In the last fifty years, however, water consumption for multiple uses and the need for global responses to water demands have dramatically increased and actual or potential conflicts have arisen.⁶ Interested states, moreover, have often been unwilling or unable to stipulate adequate treaties on the subject. As a result, jurists have turned to general principles, and started looking to state practice and legal thought for suitable definitions and rules.

The work accomplished on the subject by such distinguished bodies as the Institut de Droit International (IDI), the International Law Association (ILA) and the International Law Commission (ILC) of the United Nations indicates that the intended objective has been only partially attained.⁷ No general rule of international law has been ascertained *de iure condito*; only a few principles serve as guidelines in the interpretation of existing law and law making. These principles and guidelines are not binding law and do not impose legal obligations upon states. The guidelines and principles are, nonetheless, indispensable in determining the purpose of the rule to be created and the *ratio* of the rule of law that applies to specific cases. The principles are dependent upon two main propositions:

5. For historic precedents, see Caponera, *supra* note 1, at 3-31.

6. Major recent or current conflicts include those relating to the rivers Danube, Rhine, Indus, Ganges, Jordan, Plata, Nile, and Helmand. See Nanda, *Emerging Trends in the Use of International Law and Institutions for the Management of International Water Resources*, in WATER NEEDS FOR THE FUTURE 15-37 (V. Nanda ed. 1977).

7. See, e.g., with regard to the I.L.C., Report of the Commission to the General Assembly on the Work of its 28th Session at 153-62, U.N. Sales No. E.77 (Part II) (1977).

- (1) Common water resources are to be shared equitably between the states entitled to use them, with related corollaries of
 - (a) limited sovereignty,
 - (b) duty to cooperate in development, and
 - (c) protection of common resources.
- (2) States are responsible for substantial transboundary injury originating in their respective territories.

Principle of Sharing Resources

The concepts of "drainage basin" and "watercourse system" identify the community of interests between states in the abstract. The difference between these two concepts has been emphasized in the draft report submitted to the ILC in 1983:

For several reasons the "international drainage basin" concept met with opposition both in the discussions of the International Law Commission and in the Sixth Committee. The concern was expressed that the "international drainage basin" might imply a certain doctrinal approach for all watercourses regardless of their special characteristics and regardless of the wide variety of issues and special circumstances of each case. It was likewise feared that the "basin" concept put too much emphasis on the land areas within the watershed, indicating that the physical land area of a basin might be governed by the rules of international water resources law. Consequently, the second Special Rapporteur introduced the concepts of "international watercourse system" and "system States." In this context he stated that the term "system" is believed preferable, and is distinct from, the terms "basin" or "drainage basin," primarily in that its focus is on the waters and their uses and interdependencies.⁸

Article IV of the Helsinki Rules of the ILA states: "Each basin State is entitled within its territory to a *reasonable and equitable* share in the beneficial uses of the waters of an international drainage basin." The related comment to Article IV explains that "[t]his Article recognizes that each basin State has rights equal in kind and correlative with those of each co-basin State."⁹ Similarly, the 1983 ILC Draft conceives a legal obligation based on reasonableness and equity:

An international watercourse system and its waters shall be developed, used, and shared by system States in a *reasonable and equitable* manner on the basis of good faith and good neighbourly relations with a view to attaining optimum utilization thereof consistent with adequate protection and control of the watercourse system and its components.¹⁰

8. INTERNATIONAL LAW COMMISSION REPORT at 27 nn.71-2 (1983) [hereinafter cited as ILC REPORT].

9. ILA REPORT, *supra* note 3, at 486.

10. ILC REPORT, *supra* note 8, at 33.

The principles of *reasonableness and equity* provide the basis for a legal rule in both instances. It is important to acknowledge, however, that reasonableness depends on the natural features of each watercourse and that equity depends on circumstances. The Helsinki Rules list the relevant factors to determine what is reasonable and equitable in a particular case.¹¹ The ILC Draft is even more comprehensive and emphasizes that water sharing is not restricted to quantity apportionment. The ILC Draft also focuses on the use, conservation, and development of the resources.¹²

Neither the ILA nor the ILC text provides adequate evidence of the existence of mandatory rules of international law because the proper rule

11. According to the Helsinki Rules:

- (1) What is reasonable and equitable share . . . is to be determined in the light of all the relevant factors in each particular case.
- 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 social and economic needs of each basin State;
 - (h) the availability of other resources;
 - (i) the avoidance of unnecessary waste in the use of waters;
 - (j) the practicability of compensation as a means of adjusting conflicts among users;
 - (k) the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

ILA REPORT, *supra* note 3, at 488.

12. ILC REPORT, *supra* note 8, at 35, Arts. 8/1:

Determination of reasonable and equitable use

1. In determining whether the use by a system State of a watercourse system or its waters is exercised in a reasonable and equitable manner in accordance with article 7, all relevant factors shall be taken into account whether they are of a general nature or specific for the watercourse system concerned.

Among such factors are:

- (a) the geographic, hydrographic, hydrological and climatic factors together with other relevant circumstances pertaining to the watercourse system concerned;
- (b) the special needs of the system State concerned for the use or uses in question in comparison with the needs of other system States including the stage of economic development of all system States concerned;
- (c) the contribution by the system State concerned of waters to the system in comparison with that of other system States;
- (d) development and conservation by the system States concerned of the watercourse system and its waters;
- (e) the other uses of a watercourse system and its waters by the State concerned in comparison with the uses by other system States, including the efficiency of such uses;
- (f) cooperation with other system States in projects or programmes to attain optimum utilization, protection and control of the watercourse system and its waters;
- (g) the pollution by the system State in question of the watercourse system in general and as a consequence of the particular use, if any;
- (h) other interference with or adverse effects, if any, of such use for the uses or

is shaped, in each single instance, according to the will of the parties concerned. States are, therefore, consistently invited to arrive at mutual understanding through consultation, negotiation, and agreement, with reference to specific water basins or systems.¹³ If the involved states fail to reach an understanding, they can only rely on established legal procedures for the settlement of international disputes. Consultation, negotiation, and mutual agreement among the involved states imply a perception of the water unit as a natural phenomenon and envisage the corresponding community of interests as a "social" community that ought to be regulated according to reason and equity. This perception is quite different from describing the community of interests as a "legal" community in which resolution of transboundary water resource disputes are mandated by law.

Limited Sovereignty

Reasonableness and equity cannot, by themselves, be considered as law, i.e., as independent sources of international rights and obligations. These principles, however, do limit other principles on sovereignty. In particular, they mark the rejection of the principle of absolute territorial sovereignty whereby a state has the exclusive and unlimited right to utilize and dispose of international waters flowing through its territory. The principle of absolute territorial integrity, moreover, may no longer be considered an established unconditional right. Consequently, downstream states may no longer claim unaltered water volume and quality within their territory. The principles of equity and reasonableness describe the interdependence of states in a water community, whereas the principles of state sovereignty illustrate exclusive jurisdiction within the state territory. Confronted with a factual situation, nothing prevents the independence of sovereignty from giving way to interdependence suggested by the principles of equity and reasonableness. Principles of international

interests of other system States including but not restricted to, the adverse effects upon existing uses by such States of the watercourse system or its waters and the impact upon protection and control measures of other system States;

(i) availability to the State concerned and to other system States of alternative water resources; . . .

13. ILC REPORT, *supra* note 8, at 36, Art. 8/2:

In determining . . . whether a use is reasonable and equitable the system States concerned *shall negotiate* in a spirit of good faith and good neighborly relations in order to solve the outstanding issues. If the system States concerned fail to reach agreement by negotiations within a reasonable period of time they shall resort to the peaceful settlement procedures provided for in Chapter V of this convention. (emphasis added).

Similarly, the International Court of Justice (ICJ) when apportioning the resources of the continental shelf in the North Sea Continental Shelf case, resorted to equity as a guideline and called on the interested States to create their own rules by common agreement: ". . . those principles being that delimitation must be the object of agreement between the States concerned and that such agreements must be arrived at in accordance with equitable principles." 1969 I.C.J. 46 n.85.

law must be consistent with the evolving practices of states; after all, sovereignty itself is only one, albeit the most significant, of many circumstances to be taken into account in the interpretation and development of international law.

Duty to Cooperate in Development

The logical implication of the concept of community of interests is "cooperation," however controversial its meaning is in international law. *De lege lata*, no duty for the basin or system state to cooperate, is likely to be found outside the framework of an international agreement. The enunciation of principles expressing some obligation about information, consultation, and negotiation, *de lege ferenda*, however, is in line with current international practice.¹⁴ The latest trends of international law, moreover, suggest states are expected to delay new works or utilization of international shared water resources for a time that circumstances indicate as "reasonable" pending negotiation.¹⁵

Another principle inferred from the water community concept is that basin or system states promote cooperation for the purpose of long-term, systematic planning of the use of shared water resources.¹⁶ The obligation for states to establish appropriate procedures for coordinated development of municipal legislation on water law, with special reference to liability and compensation, appears to be more stringent and, therefore, more perplexing.¹⁷ Finally, the question of whether legal principles, alone, are sufficient to force states to establish appropriate mechanisms to jointly manage shared water resources is unresolved.¹⁸

Apart from any consideration of the binding force of these statements,¹⁹ implementing international cooperation in water use, management, and protection is not an easy task. In the most favourable conditions, cooperation is the result of lengthy negotiations and unabated good will. Although widely accepted as a guide to concrete determinations, the "equitable utilization" or "apportionment" principle has not always proved adequate. National interests often prevail when shared resources have to be allocated, when priorities have to be established among different uses, and when decisions have to be enforced. Decisionmaking on these issues

14. On this topic, see Bourne, *Procedure in the Development of International Drainage Basins: The Duty to Consult and Negotiate*, 10 CAN. Y.B. INT'L L. 212-34 (1972).

15. Organization for Economic Cooperation and Development (OECD), Council Rec. C(74)222, Title E, n.8 and the Annex, *reprinted in* INTERNATIONAL LEGAL MATERIALS (ILM) 1975 at 246.

16. *Id.*, Title B, n.1.

17. See U.N. Conference on the Human Environment, Principle 22 (Stockholm Conference 1972), *reprinted in* Caponera, *supra* note 1, at 154.

18. ILA REPORT OF THE 58TH CONFERENCE 249 (1978).

19. Florio, *Water Pollution and Related Principles of International Law*, 17 CAN. Y.B. INTL L. 134-58 (1979).

seldom rests in a joint commission, committee, or like institution. More often, all relevant decisions are negotiated piecemeal and approved unanimately by all states concerned, whether separately or within a collegiate body. Institutionalized cooperation is more successful in preparing the necessary data for decisionmakers: collecting and standardizing information, investigating facts, and considering special circumstances, are prerequisites to a more equitable determination of shared water benefits. Responsibility is sometimes given to a technical body or to a joint commission to: (a) prepare draft regulations to be enacted and enforced by member states; or (b) to perform other administrative functions such as registering and licensing.²⁰ The idea of joint planning for a whole international water system also has gained ground along with the "basin" approach.²¹

Duty to Cooperate in Protection

Principles are emerging from state practice concerning protection of water resources and transfrontier water pollution, especially with regard to toxic industrial waste and the spread of waterborne diseases. Individual states, as a first measure, are expected to adopt adequate legislative and administrative provisions to regulate and control frontier water pollution within their jurisdiction, insofar as technically feasible and consistent with the economic condition of the country concerned.²² States are also expected to develop and improve techniques for the utilization, recycling, and purification of frontier waters within their respective jurisdictions.²³ Compatibility with available technology and with local socioeconomic circumstances is, again, a limiting factor as the principles become more exacting. For instance, the OECD upheld a provision that states promote improved water quality through the establishment of priorities in the use

20. For instance, the Permanent Indus Commission between India and Pakistan; the India-Bangladesh Committee created to administer the sharing scheme of the Ganges waters at the Farakka barrage; the Mekong Secretariat; the Executive Secretariat of the Lake Chad Basin Commission; or the Secretariat of the Kagera Basin Organization.

21. Many basin organizations have been organized and assisted by the United Nations system, such as the Lake Chad Basin Commission, the Senegal Basin Development Organization, the Gambia Basin Development Organization, the Mekong Committee, the Niger Basin Authority, and the Kagera Basin Organization.

22. See Treaty Concerning the Regulation of Water Management Questions Relating to Frontier Waters, December 7, 1967, Austria-Czechoslovakia, art. 3, 4, 728 U.N.T.S. 356. See also Agreement Concerning Frontier Watercourses, April 24, 1964, Finland-U.S.S.R., art. 4.1, 537 U.N.T.S. 254; Agreement Relating to Water Quality in the Great Lakes, April 15, 1972, Canada-United States, art. 4, 837 U.N.T.S. 220.

23. The following statement by OECD may be quoted as a good illustration: "Sewage treatment and disposal policies should be strengthened by various means such as recycling and making beneficial use of effluent and sewage sludge." OECD Council Rec. C(76)161, Annex A/15. Similarly, Principle VII/2 of the European Water Charter, reprinted in Caponera, *supra* note 1, at 212.

of water resources not in conflict with neighboring countries' priorities.²⁴ It has been stressed that individuals in a country affected by water pollution originating within the jurisdiction of another country be ensured equal protection in any resulting judicial procedures.²⁵ In a broader context, the necessity of preventing water pollution that may harm or threaten the fundamental interests of the international community has received attention.²⁶

Responsibility for Injury Across Frontiers

The perspective of international responsibility does not dispel doubts about the binding force of the principles mentioned regarding the use, development, and protection of shared water resources. Many attempts have been made to employ the general principles of responsibility as a substitute for specific, mandatory rules, but the attempts have failed for the same reasons that prevent equity from substituting the rules of law. Responsibility, like equity, refers to the application of the law which depends on circumstances and, consequently, cannot be formulated in terms of general rules.

States are, however, undeniably responsible under general international law for acts and omissions concerning activities that take place within their jurisdiction. States must account for any such activities which adversely affect the interests or the rights of other states. If the detrimental effects were properly "defined," a general rule might be derived from those definitions. But the harmful consequences of activities bearing on water resources can only be assessed by reference to the beneficial uses of water and to the water quality standards required by said uses. For example, the Canada-U.S.A. Water Quality Agreement on the Great Lakes defines the harmful quantity of a noxious substance as "any quantity of a substance that if discharged into receiving waters would be inconsistent with the achievement of the water quality objectives."²⁷ The assessment and legal significance of the harmful pollution, therefore, depend on the beneficial uses which may be affected. The importance of these

24. OECD Council Rec. C(74) 224, Title B/1/c; European Economic Community (EEC) Council on Principle Concerning Transfrontier Pollution, Directive on the Quality Required of Surface Water Intended for the Abstraction of Drinking Water in the Member States, June 16, 1975, 18 O.J. EUR. COMM. (No. L 194) 38 (1975); Council Directive of March 20, 1978, 21 O.J. EUR. COMM. (No. L 84) 43 (1978).

25. E.g., EEC Directive, June 16, 1975, *id.*; Council Directive of March 20, 1978, *id.*

26. The draft article on international responsibility adopted by the ILC at its 35th Session (1983) admits that an international crime may result from serious disregard of the fundamental interests of the international community in the field of human environment (Art. 19/23(d)).

27. Agreement Relating to Water Quality in the Great Lakes, April 15, 1972, Canada-United States, preamble, 837 U.N.T.S. 213.

uses, however, is relative to each watercourse and dependent upon the circumstances. The determination of whether the injuring state's conduct was legitimate or illegitimate cannot, therefore, be provided by a general and abstract rule.

More specific definitions regarding water resources have been incorporated into recent international treaties and agreements. Treaties regarding single watercourses have dropped the "substantial" or "appreciable" attribute as a criterion when evaluating harm and liability. The treaties contain more detailed provisions which define the beneficial uses or the water quality standards ("black" and "grey" lists).²⁸ Regional and bilateral agreements establish the required water quality, the admissible toxicity, the persistence and accumulation, as well as the kind and quality, of pollutants.²⁹ Each treaty containing water quality standards is stipulated for definite waters and for particular uses and users. Any deviance or extrapolation from these standards, therefore, is likely to cause confusion. Water quality standards resulting from existing treaties, even though substantially similar in different texts, cannot be taken as acceptable generally. The standards are relevant only when considered with other factors and in conjunction with the general standards of international responsibility for assessing injury, fault, and negligence.

In conclusion, the principles and rules of international water resources law developed in this section are not yet firmly established. The principles, however, are evolving rapidly under the pressure of the realization that water resources are limited in quantity and quality. International law also assists states in creating the appropriate procedures and machinery for cooperation and joint management.

INSTITUTIONAL FRAMEWORK FOR COOPERATION AND MANAGEMENT

International water development and protection is best achieved, as proven by state practice, by resorting to administrative procedures and

28. Among the most conspicuous examples: Agreement Relating to Water Quality in the Great Lakes, April 15, 1972, Canada-United States, art. I/e and Annex I, 837 U.N.T.S. 213; Convention on the Protection of the Rhine Against Chemical Pollution, December 3, 1976, 16 I.L.M. 253 (1977) (signed at Bonn between Germany, France, Luxemburg, Netherlands, Switzerland, EEC, Belgium, Denmark, Ireland, Italy, and the United Kingdom); European Convention on Detergents, September 16, 1968, 788 U.N.T.S. 183. With regard to land based pollution, see the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution, February 16, 1967, 15 I.L.M. 290 (1976) (with related protocols and annexes).

29. The kind and quality of pollutants are listed in one or more annexes dealing with salinity, crude oil, persistent plastic and other synthetic materials, organohalogen compounds, pesticides, radioactive wastes and so on. See, e.g., The Agreement Between the United States of America and Canada signed at Ottawa, November 22, 1978, United States-Canada, 30 U.S.T. 1383, T.I.A.S. No. 9257; Agreement on the International Commission for the Protection of the Rhine Against Pollution signed at Bern, April 29, 1963, 994 U.N.T.S. 3.

agencies which are endowed with adequate powers and the necessary flexibility to handle the constant changes brought about by increased water demand, new uses, and technological advances. Various mechanisms adopted by states to regulate the utilization of shared water resources are discussed in this section of the article.

Global Institutions

Because of the importance of and the potential conflicts arising over shared water resources, many of the institutions of the United Nations are engaged in a wide range of activities involving water management and facilitating intergovernmental cooperation.³⁰ The United Nations Secretariat has prepared publications to assist states to cooperate in the development of shared water resources. The Secretariat, moreover, has acted as a catalyst in designing, establishing, strengthening, and supporting intergovernmental water resources institutions for the purpose of facilitating transboundary cooperation. A panel of experts convened in 1969 to study the legal and institutional aspects of international water resources development.³¹ The panel emphasized the need not only to establish appropriate international rules pertinent to the management of international non-maritime water resources under the auspices of the United Nations, but also to establish adequate administrative arrangements among states sharing the same water basin.

The most important recommendations regarding institutional arrangements have come from the United Nations Water Conference held at Mar del Plata, Argentina, in 1977.³² The approved Mar del Plata Action Plan stated that:

States sharing water resources . . . should cooperate in the establishment of programs, machinery, and institutions necessary for the coordinated development of such resources. . . and establish joint committees, . . . to provide for the . . . collection, standardization and exchange of data, the management of shared water resources, the prevention and control of water pollution, the prevention of water-associated diseases, mitigation of drought, flood control, river improvement activities, and flood warning systems.³³

30. Institutional support is provided, *inter alia*, to basin institutions of the Mono (Benin-Togo), Logone (Cameroon-Chad), Senegal, Kagera (Burundi, Rwanda, Tanzania), the Gambia (Gambia, Senegal, Guinea), Paraguay (Argentina, Paraguay), Yaguaron (Brazil, Uruguay), Vardar/Axios (Greece, Yugoslavia), and Mono (Liberia, Sierra Leone).

31. United Nations, Panel of Experts on the Legal and Institutional Aspect of International Aspects of International Water Resources Development. Management of International Water Resources, Natural Resources/Water Series No. 1 at 181-4, U.N. Sales No. E.75.II.A.2 (1975).

32. Report of the United Nations Water Conference, Mar del Plata, March 14-25, 1977, U. N. Sales No. E.77.II.A.12 (1977).

33. *Id.*

Pursuant to Resolution VII of the Mar del Plata Action Plan, the U.N. Secretariat convened a meeting of the International River Organizations at Dakar in 1981³⁴ for the purpose of "developing a dialogue between the different organizations on potential ways of promoting the exchange of their experience." The meeting concluded that "multinational activities in respect of international watercourses should be supported by appropriate machinery at the national level which would act as a liaison with the international agencies and coordinate and take account of the various sectors involved at all levels of administration concerned. . . ." The agreement establishing international water organizations, moreover, "should at least contain, within the framework of principles of international water law acceptable to the contracting states, the following elements which should be defined as clearly as possible: objectives, territorial jurisdiction, composition, authority and power, decisionmaking procedures, financial provisions, procedures for the prevention and settlement of disputes."³⁵

The U.N. Conference on the Human Environment, held in Stockholm in 1972,³⁶ also proclaimed a number of principles bearing on water within the broader context of protection of the human environment. Among them, Principle 24 and the Action Plan declare that cooperation through multilateral or bilateral arrangements is essential in international relations to protect and improve the environment.³⁷ The Conference further recommended that ". . . [g]overnments concerned consider the creation of river basin commissions or other appropriate machinery for cooperation between interested States for water resources common to more than one jurisdiction . . ."³⁸ Following the Stockholm Conference, the United Nations Environment Programme (UNEP) was created as a secretariat to implement international cooperation regarding environmental aspects of shared water resources.³⁹

34. United Nations, *Experiences in the Development and Management of International River and Lake Basins*, Proceedings of the U.N. Interregional Meeting of International River Organizations, Dakar, Senegal, May 5-14, 1981, Natural Resources/Water Series No. 10, U.N. Sales No. F.82.II.A.17 (1983).

35. *Id.* at 9.

36. Report of the United Nations Conference on the Human Environment held at Stockholm, June 5-16, 1972, U.N. Doc. A/CONF.48/14/Rev. 1 (1972).

37. International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big or small, on an equal footing. Cooperation through multilateral or bilateral arrangements or other appropriate means is essential to effectively control, prevent, reduce, and eliminate adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.

Recommendation 51, UN Doc. A/Conf.48/14, partially reprinted in Caponera, *supra* note 1, at 154-56.

38. *Id.*

39. G.A. Res. 2997 (XXVII) of 15 December 1972, U.N. Resolutions Adopted by the General Assembly during its Twenty Seventh Session, 19 September-19 December 1972, at p. 62.

In 1974, a Resolution of the U.N. General Assembly proclaiming the Charter of Economic Rights and Duties of States stated that:

In the exploitation of natural resources shared by two or more countries, each State must cooperate on the basis of a system of information and prior consultation in order to achieve optimum use of such resources without causing damage to the legitimate interest of others . . . all States have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.⁴⁰

Institutional arrangements for the management of water resources among states sharing common basins have always been created or assisted by other international organizations, under the overall sponsorship of the U.N. Economic and Social Council.⁴¹ For instance, the FAO assists national governments and river basin committees in drafting water laws and in the building of institutions.⁴² UNESCO activities have developed since 1949 to assess water resources, first through its Arid Zones Program⁴³ and later through the International Hydrological Decade.⁴⁴ Since 1975, the International Hydrological Program (IHP) managed over ninety IHP national committees and more than twenty national focal points. The IHP, moreover, has launched three major regional projects for "the rational utilization and conservation of water resources in rural areas," covering Latin America, the Caribbean, the Arab States, and Africa, some of which included studies of shared aquifers.⁴⁵ The World Health Organization (WHO), through its International Drinking Water Supply and Sanitation Decade,⁴⁶ has been a spearhead in promoting field projects involving water supply and sanitation activities. WHO is also the leading agency, in cooperation with UNEP, UNESCO, and the World Meteorological Organization (WMO), to sponsor the Global Environmental Monitoring

40. G.A. Res. 3281 (XXIX) of 12 December 1974, U.N. Resolutions Adopted by the General Assembly during its Twenty Ninth Session, Vol. I, 17 September-18 December 1974, pp. 50, 52, 55.

41. For a description of these activities, see *Note on Guide to Agencies and Offices of the United Nations System Active in the Water Field*, Report of the Joint Inspection Unit, Geneva, June 1981, pp. 3-4 (JIU/NOTE/81/1) [hereinafter cited as NOTE].

42. FAO assists the following institutions: Lake Chad Basin Commission (LCBC); Mirim Lagoon Commission (Brazil and Argentina); Nepal-India Kosi/Ganges basins; Niger/Nigeria Mixed Commission (Kamadougou Yobe); Maputo, Komati, and Limpopo basins (Botswana, Mozambique, Republic of South Africa, Swaziland).

43. NOTE, *supra* note 41, at 12. For a brief explanatory account of the Arid Zones Program, see 1 NATURE AND RESOURCES 1-5 (No. 1, 2).

44. NOTE, *supra* note 41, at 12; see also 1 NATURE AND RESOURCES 1-3 (No. 3).

45. NOTE, *supra* note 41 at 11-12.

46. *Id.* at 14-5. See 34 U.N.Y.B. 1286 (1980).

Systems (GEMS) project.⁴⁷ In conjunction with FAO regarding agricultural water development projects, WHO and UNEP have also initiated a program to monitor the control of disease vectors associated with water, such as malaria mosquitos, and bilharzia snails.⁴⁸ The World Meteorological Organization (WMO) also maintains the role of assessing water resources, particularly with regard to hazards of meteorological origin such as droughts, floods, and tropical cyclones. Regional cooperation in water resources is organized through WHO's six regional associations and some activities are carried out in cooperation with river basin commissions.⁴⁹

Regional Political and Economic Institutions

More detailed models of international cooperation are provided by agencies of regional scope. The mechanisms developed by these agencies are consistent with the peculiarities of each water system and related socioeconomic conditions. The legal-institutional problems raised by the use of shared water resources are under constant survey by practically all of the U.N. regional commissions. The U.N. Economic Commission for Europe (ECE) has a well established machinery for cooperation between its member governments.⁵⁰ The Committee on Water Problems has been particularly concerned with surface and groundwater policy, legislation and management, as well as the field of transboundary waters. In 1980 the ECE Declaration of Policy on the Prevention and Control of Water Pollution, including Transboundary Pollution adopted fourteen principles to assist European countries in the use and management of shared water resources. Although the ECE is not engaged in operational water projects, it does, however, generate useful contacts between governments and experts as, for example, during the meetings on International River Commissions which also took place in 1980.⁵¹

The U.N. Economic Commission for Latin America (ECLA),⁵² in im-

47. Under GEMS, three to four hundred river stations are being established to measure pollution. NOTE, *supra* note 41, at 15-6. See also ENVIRONMENTAL PROTECTION: THE INTERNATIONAL DIMENSION 83 (D. Kay & H. Jacobson eds. 1983).

48. This program has now been illustrated in "Environmental Management for Vector Control in Rice Fields," FAO Irrigation and Drainage Paper No. 41 (May 1984).

49. NOTE, *supra* note 41, at 15-6. Major WMO projects include those in hydrology in the Sahel, Upper Nile, Indus, Ganges, Niger, and Amazon basins, and Central America.

50. The ECE Resolution 7:12 (XXII) of April 1967, art. 1, established for the first time a body on Water Resources and Pollution Control. There are many subsequent resolutions which directed the water programmes of ECE. Regarding cooperation in the field of transboundary waters, the recent commission decisions D(XXXVII) and E(XXXVII) are relevant, U.N. Doc. WATER/SEM.11/3 of October 1984. See NOTE, *supra* note 41.

51. NOTE, *supra* note 41, at 7-8.

52. The ECLA authority to act in the field of water resources derives from ECLA Resolution 99 (VI) of September 15, 1958, followed by many other resolutions. Of particular interest is ECLA Resolution 131 (VII) of May 17, 1957, which requested ECLA to approach Latin American countries with regard to the utilization of rivers and lakes situated in international hydrographic basins. See also NOTE, *supra* note 41.

plementing the Mar del Plata Action Plan of 1977 through a sessional committee, established a water resources unit in its secretariat. The water resources unit promotes "intergovernmental cooperation in the management of shared water resources and facilitates coordination at the regional level."⁵³

The U.N. Economic Commission for Africa (ECA)⁵⁴ also has an important role in the field of shared water resources, particularly with regard to assessing, planning, and providing for safe water supplies. The ECA has set up an integrated regional interagency board to cooperatively develop international lake and river basins.⁵⁵

The U.N. Economic and Social Commission for Asia and the Pacific (ESCAP),⁵⁶ however, has the longest and most impressive history of activities in the management of shared water resources. In 1951 cooperative arrangements on flood warning and mitigation, and on typhoon and tropical cyclones warning systems, were initiated. The ESCAP, moreover, has been the prime motivating influence behind the creation and support of the Mekong Committee, which is a precedent for international river basin cooperation.⁵⁷

Finally, the U.N. Economic Commission for Western Asia (ECWA)⁵⁸ has recently proposed to establish a regional Water Resources Council and has been engaged in a number of activities to establish regional cooperative institutions for the management of shared water resources.⁵⁹

Outside the U.N. system, the intergovernmental agencies having responsibilities in shared water resources management have increased in both number and multiformity. Outstanding among them is the Organization for Economic Cooperation and Development (OECD) which includes eighteen European countries.⁶⁰ The OECD is primarily concerned with promoting policies designed to achieve economic expansion while maintaining financial stability. The OECD has promoted methods and

53. NOTE, *supra* note 41, at 8-9.

54. The United Nations Economic Commission for Africa (ECA) Conference of Ministers, by Resolution 308 (XIII) of 1967 urged ECA to take all steps necessary to assist African countries in the area of shared water resources. *See also* NOTE, *supra* note 40.

55. NOTE, *supra* note 41, at 6.

56. The ESCAP authority in the field of water resources derives from the ECAFE Resolution E/CM.11/110 of June 8, 1948. *See also* NOTE, *supra* note 41.

57. NOTE, *supra* note 41, at 6. The Mekong Committee includes Cambodia, Laos, Vietnam, and Thailand.

58. ECWA's activities in water resources are a follow up on the U.N. Water Conference (ECWA Regional Meeting, December 28, 1978-January 3, 1979, Riyadh, Doc. E/C.7/94). *See also* NOTE, *supra* note 41.

59. NOTE, *supra* note 41, at 9.

60. The members of the OECD include Austria, Belgium, Denmark, Finland, France, Federal Republic of Germany, Greece, Iceland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom, as well as Australia, Canada, Japan, New Zealand, and the United States. For an account of the OECD and its activities, *see, e.g.*, Organization for Economic Cooperation and Development Secretariat, Activities of the OECD in 1981: Report by the Secretary-General, Paris, O.E.C.D. (1982).

procedures for the economic development of beneficial uses of water resources on the basis of mutual understanding and environmental protection. The OECD accomplishes its goals by examining common problems related to the improvement of water resources, by reviewing and consulting on action proposed or taken by member countries, by providing member governments with policy options or guidelines, and by encouraging the harmonization of policies among member countries. The OECD has recommended water management policies and instruments⁶¹ in conjunction with strategies for specific water pollutants control.⁶²

Another regional agency which has contributed to the evolution of water policies coordination between member countries is the Council of Europe. The Council's Water Charter of 1967 stands as a landmark in this field.⁶³ The European Economic Community (EEC),⁶⁴ moreover, has promulgated effective directives which provide water quality standards for drinking and fishing, as well as for municipal and industrial consumption.⁶⁵ Other important actions of the EEC relate to the exchange of information in regard to groundwater protection, and to training in water resources management.⁶⁶

The Council for Mutual Economic Assistance (CMEA)⁶⁷ and the European Committee for Standardization (CEN)⁶⁸ have carried out activities

61. Recommendation of the Council on Water Management Policies and Instruments, April 5, 1978, Paris, *reprinted in* Organization for Economic Cooperation and Development, Paris Doc. C(78)4 Final.

62. OECD Council Recommendation on Principles concerning Transfrontier Pollution, April 5, 1978, Paris, *reprinted in* Organization for Economic Cooperation and Development, Paris Doc. C(74)224.

63. The text of the Water Charter is in Legal Problems Relating to the Nonnavigational Uses of International Water Courses: Supplementary Report by the Secretary-General, DOC. A/CN.4/274, 2 Y.B. INT'L L. COMM'N 342-43 (1974).

64. Treaty Establishing the European Economic Community (EEC), March 25, 1957, 298 U.N.T.S. 3. See generally, INSTITUTIONS AND POLICIES OF THE EUROPEAN COMMUNITY (J. Lodge ed. 1983).

65. Council Directive Concerning the Quality Required of Surface Water Intended for the Abstraction of Drinking Water in the Member States, June 16, 1975, 18 O.J. EUR. COMM. (No. L 194) 38 (1975); Council Directive on Pollution Caused by Dangerous Substances Discharged into the Aquatic Environment of the Community, May 1976, 19 O.J. EUR. COMM. (No. L 129) 23 (1976); Council Directive Relating to the Quality of Water Intended for Human Consumption, July 15, 1980, 23 O.J. EUR. COMM. (No. L 229) 11 (1980).

66. A European Training Center in Water Resources Management has been established, under EEC sponsorship, at Varese, Italy, in 1983.

67. The CMEA includes Albania, Bulgaria, Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, Poland, Rumania, USSR, and VietNam. For a description of the CMEA within the international setting, see Lukin, *The Council of Mutual Economic Assistance and the United Nations in REGIONALISM AND THE UNITED NATIONS* 449-87 (B. Andemicael ed. 1979).

68. The European Committee for Standardization was founded in March 1961 as the European Standards Coordinating Committee among the socialist states of Eastern Europe in succession to a Common Market and Free Trade Area Committee set up in October, 1957. Its present title was adopted in 1971 and the Committee was reconstituted on October 24, 1975 in Brussels. It is registered in accordance with Belgian law. See 23 Y.B. INT'L ORG. (1983). The CEN's activities regarding the Danube basin are described in UN/ECE Committee on Water Problems, *Seminar on Rational Utilization of Water* 3-4, Doc. UN/WATER/SEM.6/R.42 (April 17, 1979).

particularly relevant in the Danube basin, which is shared by eight countries. The Council and the Committee have done much work to promulgate international standards to control the quality and quantity of water, to prevent water losses, to promote and install new technologies and equipment for the treatment of water and waste water, and to develop irrigation projects having regional implications.

Again, at the regional level, the Amazon Cooperation Treaty of 1978 has established institutional cooperative arrangements among eight countries sharing the Amazon Basin: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam, and Venezuela.⁶⁹

River and Boundary Commissions

Although regional organizations have proved more efficient than those operating at a universal level, international mechanisms of cooperation have obtained the best results with regard to single, specific watercourses or basins. These institutions are created by the states concerned and have a scope geographically limited either to a given water basin, to boundary waters, or to a statutorily defined basin area. The local organs are either permanent or *ad hoc*, and consist of a standard secretariat, a technical staff, and advisory boards, as well as political organs representing the member countries and an executive council. The institutions may differ according to the powers and functions attributed to the technical bodies as well as the voting procedures adopted by the political organs representing the member states. Some agencies have a direct impact on the municipal system of member countries. Other institutions, however, have limited competence, and will only disseminate information and provide documentation and consultation. International practice is so varied that the best way to describe it is to select a few examples from among the most representative ones.

The Rhine and the Danube river commissions illustrate the traditional models of international practice. The Central Commission for the Rhine was created in 1831⁷⁰ after a lengthy process dating back to 1785 and 1816. The Rhine Commission currently includes representatives from France, Federal Republic of Germany, Netherlands, Switzerland, Belgium, and Great Britain. The Commission essentially provides consultation and technical assistance in matters primarily affecting navigation. The Rhine Commission, however, can also undertake research studies, and recommend to member states the provisions to be adopted in their respective municipal systems. Ordinarily decisions are made by majority vote, but are not binding upon dissenting countries; major policy decisions

69. Treaty for Amazonian Cooperation signed in Brasilia, July 3, 1978, 17 I.L.M. 1045.

70. Convention Relative to the Free Navigation of the Rhine, signed at Mayence, March 31, 1831, France-various German states, 10 HERTSLETT, COMMERCIAL TREATIES 471(F).

require unanimity. A separate Commission, to promote cooperation in the control of pollution, was created in 1949-50 by an exchange of notes.⁷¹ The European Commission of the Danube⁷² is an administrative body, in operation since 1948, which includes representatives from Austria, Bulgaria, Czechoslovakia, Hungary, Romania, Ukraine, USSR, and Yugoslavia. At present the regime of the Danube is regulated by the Belgrade Convention of 1948 and by a series of special agreements. The Danube Commission enacts uniform navigation rules, facilitates flood control operations, sponsors integrated energy planning, and encourages irrigation projects. Recommendations on ordinary matters are taken by a majority vote, but states directly affected by important issues have a veto power. Another organization primarily concerned with hydropower and navigation projects has been created for the administration of the lower Danube and the Iron Gates.⁷³

The International Joint Commission (IJC) established pursuant to the Boundary Waters Treaty of 1909 between Canada and the United States, is a significant illustration of modern trends in international cooperation regarding shared water resources. Consisting of six members, three from each country, this Commission was originally conceived as an instrument for preventing any water controversy between the two riparian states by examining differences between the two states and endeavouring to settle them. Over the course of time the IJC has acquired competence in a wider field. The IJC currently approves, by majority vote, all projects concerning new water uses, undertakes investigations and prepares studies of the projects, and makes proposals and creates auxiliary organs to facilitate its work. Various boards of the IJC are staffed with qualified engineers, economists, and lawyers from both countries. These investigative boards examine and recommend short and long-term planning for a balanced development of the Great Lakes area. The IJC, moreover, elaborates and supervises new projects, and formulates standards of conduct.⁷⁴

The International Boundary and Water Commission (IBWC),⁷⁵ con-

71. For references on the Central Commission for the navigation of the Rhine, see B. VITANYI, *THE INTERNATIONAL REGIME OF RIVER NAVIGATION* 101-02 (1979).

72. The first Danube Commission was established by the Treaty of Peace signed in Paris, March 30, 1856, Ottoman Empire-Other European Powers, arts. 16 and 17, 41 B.F.S.P. 8, 12. The second Danube Commission, created in 1857, also included nonriparian states until 1948, when another Danube Commission was formed among riparian states only. Convention Regarding the Regime of Navigation on the Danube signed at Belgrade, August 18, 1948, 33 U.N.T.S. 180 (1949). For the provisions dealing with the nature and functions of the Commission, see especially *id.*, arts. 5-22.

73. See Secretariat of the Danube Commission, *Practice and Principles of Development of the Danube Basin*, Seminar on the Development and Administration of the International River Basin, Doc. No. 12 (2d ed. 1963).

74. For a description of the work of the International Joint Commission, see BLOOMFIELD & FITZGERALD, *BOUNDARY WATER PROBLEMS, CANADA AND THE UNITED STATES* (1958).

75. The International Boundary and Water Commission was created by the Treaty Relating to the

cerned with the Colorado and Rio Grande rivers and the Tijuana stream, is another interesting example of bilateral cooperation in the use of shared water resources. This institution not only exercises supervisory and advisory powers, but the IBWC has responsibility for the planning, construction, and maintenance of three storage dams on the Rio Grande. In 1983, Mexico and the United States signed an agreement for the purpose of cooperatively solving environmental problems along the border area, including watercourses. To implement this agreement, each party has designated a coordinator to make recommendations and convoke meetings of experts as necessary for the purpose of coordinating the parties' national programs.⁷⁶ Many boundary commissions exist which have jurisdiction over shared rivers and basins along the border of two countries, particularly in the Americas,⁷⁷ Europe,⁷⁸ and Africa.⁷⁹

Other Pertinent Commissions and Institutions

Still other forms of cooperative institutional arrangements have developed throughout the world, particularly in recent years. In Asia, among

Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande (Rio Bravo) from Fort Quitman, Texas to the Gulf of Mexico, November 14, 1944, Mexico-United States, 3 U.N.T.S. 314. For the scope of the International Boundary and Water Commission, see *id.* at art. 2.

76. 20 ILM 1025 (1983).

77. *E.g.*, the joint commissions established by the Agreement Concerning a Study on the Parana River signed at Buenos Aires, June 15, 1971, Argentina-Paraguay, arts. 1 and 4, OEA *Rios y Lagos Internacionales* 5119 (1971); Agreement on the Use of Binational Basins Puyango-Tumbes and Catamayo-Chire signed at Washington, D.C., September 27, 1971, Ecuador-Peru, art. 14, 385 Registro Oficial (Ecuador) I (1972).

78. Treaty Concerning Frontier Waters signed at Stockholm, September 16, 1971, Finland-Sweden, ch. 2, 825 U.N.T.S. 191 (establishing joint Finnish-Swedish boundary river commission); Treaty Concerning Frontier Watercourses signed at Helsinki, April 2, 1964, Finland-U.S.S.R., art. 6 et. seq., 537 U.N.T.S. 231 (establishing joint Finnish-U.S.S.R. boundary commission); Treaty Concerning Boundary Waters signed at Warsaw, July 17, 1964, Poland-U.S.S.R., art. R et seq., 552 U.N.T.S. 175 (establishing USSR-Polish water economy frontier commission); Treaty on Water Economy and Statutes of the Commission signed at Belgrade, December 5, 1956, Albania-Yugoslavia, 1857 Federatione Narodne Republike Jugoslavie, Medunarodni Ugovari at 16 (establishing joint water boundary commissions between Yugoslavia and Albania); Treaty on Water Economy Questions signed at Sofia, April 4, 1958, Bulgaria-Yugoslavia, art. 9, 538 U.N.T.S. 89 (establishing joint water boundary commissions between Yugoslavia and Bulgaria); Treaty on Hydro-economy Questions signed at Athens on June 18, 1959, Greece-Yugoslavia, art. 1, 363 U.N.T.S. 133 (establishing joint water boundary commissions between Yugoslavia and Greece); Treaty on Water Control and Water Control Systems and on the Statutes of the Commission signed at Bucharest, April 7, 1955, Romania-Yugoslavia, 73 F.N.R.Y.-M.U. (1956) (establishing joint water boundary commissions between Yugoslavia and Romania); Agreement and Statute of the Yugoslav-Hungarian Water Economy Commission signed at Belgrade, August 8, 1955, Hungary-Yugoslavia, 63 F.N.R.Y.-M.U. 43 (1957); Treaty on Legal Relations and on Cooperation in Frontier Matters signed at Prague, December 2, 1967, Czechoslovakia-Poland, art. 12, 830 U.N.T.S. 113 (establishing joint water boundary commissions between Poland and Czechoslovakia).

79. *See, e.g.*, Treaty establishing the Niger-Nigeria Joint Commission signed at Niamey, 3 March 1971, Niger-Nigeria (text provided by the Secretariat) for the purpose, *inter alia*, to develop shared water resources.

the multilateral institutions operating in the region, the Committee for the Lower Mekong River especially deserves to be mentioned.⁸⁰ Established between Campuchea, Laos, Thailand, and the Republic of VietNam, pursuant to an agreement of 1957 on the initiative of the Economic Commission for Asia and the Far East (ECAFE), the Lower Mekong River Committee consists of one delegate from each member state. The Committee promotes, coordinates, supervises, and controls the planning and investigation of water development projects in the lower basin of the Mekong river. The most characteristic feature of the Lower Mekong River Committee is the close cooperation it has established with U.N. agencies and other organizations, especially with ECAFE. The Committee appoints an executive agent for a term of two years and includes a secretariat, an advisory board appointed for a three-year term, and a documentation center.⁸¹ One of the main achievements of the Mekong Committee has been that it has operated uninterruptedly since 1955 in spite of the political difficulties and armed conflicts prevailing among its member countries. The so-called "Spirit of the Mekong" has demonstrated that cooperative arrangements on transboundary water questions may continue even in times of armed conflict.

The Permanent Indus Commission, established in 1960 between India and Pakistan, is another example of bilateral institutions in Asia.⁸² India and Pakistan have each appointed a high-ranking engineer whose function not only includes the settlement of disputes concerning the interpretation and application of the 1960 Agreement, but also the study of problems referred by the two governments. The Indus Commission may also conduct inspections and make recommendations. The main purpose of this agency is to prepare specific cooperative arrangements, but it also initiates studies, and coordinates the parties' water policies. A particular feature of the Indus Commission is the heavy involvement of the World Bank (IBRD).⁸³ In 1972, an agreement between India and Bangladesh⁸⁴ created a joint river commission for harnessing the water resources shared be-

80. Statute of the Committee for Coordinating Investigations of the Lower Mekong Basin affirmed and signed at Phnom-Penh, October 31, 1957, established by the government of Cambodia (now Kampuchea), Laos, Thailand, and the Republic of VietNam, in response to a decision taken by UN/ECAFE. UNITED NATIONS, LEGISLATIVE TEXTS AND TREATY PROVISIONS CONCERNING THE USE OF INTERNATIONAL RIVERS FOR OTHER PURPOSES THAN NAVIGATION 369 (1964) (DOC. ST/LEG. SER. E/12).

81. See the Mekong Committee Annual Reports issued since 1958 by the Executive Mekong Committee Secretariat in Bangkok. See L. TECLAFF, *THE RIVER BASIN IN HISTORY AND LAW* 172 (1967).

82. Indus Water Treaty signed at Karachi, September 19, 1960, India-Pakistan-IBRD (World Bank), art. 8, 419 UN T.S. 125.

83. In fact, the IBRD was instrumental in setting up the Permanent Indus Commission in order to settle a water conflict between India and Pakistan. See TECLAFF, *supra* note 81, at 164.

84. Agreement Creating a Joint Ganges Commission, November 29, 1972, Bangladesh-India, reprinted in Indo-Bangladesh Joint River Commission Publication, Dhaka.

tween the two countries. As a consequence of a dispute caused by India's building of the Farakka dam just before the Ganges enters Bangladesh, another agreement was signed in 1977 for the allocation of the Ganges waters between the two countries.⁸⁵ This 1977 Agreement reflects a commitment to the principles of prior consultation before undertaking water resources development, as well as a commitment to the equitable apportionment of shared water resources. The 1977 Agreement was valid initially for a period of five years, but was renewed in 1982 for a period of two years under the form of a memorandum of understanding; it appears that no new agreement has been signed since 1984.⁸⁶

Africa offers a large number of multilateral river institutions which have increased in number, variety, and importance since World War II. The decolonization process and the need felt by African governments for economic regional integration provided the incentive to establish these river institutional bodies. The International Commission for the Navigation of the River Congo, created by the Act of Berlin of 1885, is an historical precedent, because it introduced the principle of freedom of navigation to African rivers.⁸⁷ The Act of Berlin also applied the principle of freedom of navigation to the Niger, although a special institution was not created.

In 1964, a Niger River Commission was created between the nine riparian countries for promoting and coordinating all programs and studies related to the exploitation of the basin resources. The Niger River Commission is assisted by a Secretary General and an appropriate staff of experts. The personnel of the commission are entrusted with certain planning functions, exchanging information, preparing recommended decisions to be taken by member governments, and facilitating the settlement of disputes between the parties.⁸⁸ In 1980 the Niger River Commission was transformed into the Niger River Authority for the purpose of insuring an integrated developmental program for all Niger basin water resources activities, and not only for the aspects of river navigation.⁸⁹ The insti-

85. Agreement Between the Government of the People's Republic of Bangladesh and the Government of the Republic of India on Sharing of the Ganges Waters at Farakka and in Augmenting its Flows signed at Dacca, November 5, 1977, Bangladesh-India, 17 I.L.M. 103 (1978). For a description of the Ganges dispute, see *River Basin Development*, 4 Water Resources Series (M. Zaman ed. 1981).

86. Private communication to the author.

87. General Act of the Conference of Berlin respecting Freedom of Navigation of the Congo, February 26, 1885, art. 17 (establishing the International Commission of the Congo), HERTSLETT, 17 COMMERCIAL TREATIES 62.

88. Act regarding Navigation and Economic Cooperation between the Nine Co-basin States of the Niger Basin, October 26, 1963, arts. 5 and 6, 587 U.N.T.S. 9.

89. Convention creating the Niger Basin Authority, November 21, 1980, art. 3, *reprinted in* United Nations, *Treaties Concerning the Utilization of International Water Courses for Other Purposes than Navigation, Africa*, 13 Natural Resources Water Series 56, U.N. Sales No. E/F.84.II A.7 [hereinafter cited as UN/Africa Water Treaties]. The parties to the Convention include Benin, Cameroon, Chad, Ivory Coast, Guinea, Mali, Niger, Nigeria, and Upper Volta.

tutions of the Niger River Authority are: (1) the Summit of Heads of State and government; (2) the Council of Ministers representing the member States; (3) the Technical Committee of Experts; and (4) the Executive Secretariat. The quorum of the Summit and of the Council of Ministers is a simple majority and the decisions, directives, resolutions, and recommendations so adopted by consensus are binding on the institutions of the Authority. The functions of the Authority include the collection, centralization, standardization, exploitation, dissemination, and exchange of technical data; coordination and consideration of plans and projects presented by member states with a view toward making recommendations; monitoring of research and works undertaken by member states; and plan coordination and formulation.⁹⁰

The Senegal River Basin Management Organization (OMVS) was created between Mali, Mauritania, Senegal, and Guinea in 1972, with the purpose to encourage and coordinate water resources development in the Senegal river basin.⁹¹ The main organs are: (1) a Conference of Heads of State upon which rest all final decisions; (2) a Council of Ministers which makes decisions or recommendations to the Conference and prepares and controls the activities of the Organization; (3) a High Commissioner (added in 1979); (4) a Secretary General; (5) a Permanent Water Commission; and (6) an Advisory Board to deal with water resource sharing. A number of subcommittees have been set up for administrative and judicial matters concerning navigation, hydropower, and irrigation. The unanimous decisions of the Conference and of the Council of Ministers of the OMVS automatically bind its member states. Some major decisions of the OMVS include the principles that all works of common interest shall be jointly owned by the member states, and member states will be jointly liable for debts contracted.⁹² The creation and work of OMVS have been inspired by the most recent and advanced doctrines based on the concept of international basin waters and integrated equitable sharing of the basin water resources. Water rights of each member state of the OMVS are limited by the respective rights of the other states and are developed through planning for the exploitation of the joint resources.

A number of similarly advanced forms of institutional arrangements for the integrated development of shared river and lake basins have been created in Africa. These include the Lake Chad Basin Commission (LCBC)

90. See *id.*, art. 4.2a.

91. Convention relative au statut du fleuve Senegal, March 11, 1972, Mali-Mauritania-Senegal, reprinted in UN/Africa Water Treaties, *supra* note 89, at 21. This convention replaced the previous convention of February 7, 1964. There is a large literature describing the historical evolution of the institutions relating to the Senegal River basin, but see Parnall & Utton, *The Senegal Valley Authority: A Unique Experiment in International Basin Planning*, 51 *IND. L.J.* 235 (1976).

92. Resolution of the Council of Ministers of the OMVS No. 4/74, later embodied in the Convention on the Legal Status of Works of Common Interest, December 21, 1978, Mali-Mauritania-Senegal, reprinted in UN/Africa Water Treaties, *supra* note 89, at 48.

between Cameroon, Chad, Niger, and Nigeria;⁹³ the Organization for the Development of the Gambia River Basin (OMVG) between Gambia, Republic of Guinea, and Senegal,⁹⁴ and later by Guinea (Conakry),⁹⁵ the fourth co-basin state. In 1983, Guinea Bissau, although not a state sharing the Gambia basin, joined this organization.⁹⁶ This demonstrates that basin organizations may serve as focal starting points not only for water resources management, but also for larger economic integration. The Kagera Basin Organization, created in 1971 between Burundi, Rwanda, and Tanzania and later joined by Uganda, purports to plan and develop jointly the Kagera sub-basin, which is a part of the Nile basin.⁹⁷

Other forms of international cooperation for the management of shared water resources exist in Africa. Some technical commissions have been created in special areas. In 1971, a Niger-Nigeria mixed commission was created for the development of boundary rivers, particularly the Komadougou-Yobe, a sub-basin of the Lake Chad basin.⁹⁸ Close institutional arrangements exist between Egypt and Sudan for sharing of the Nile waters,⁹⁹ and between all Nile basin states with regard to collection of hydrologic data.¹⁰⁰ The creation of a Nile Basin Commission with the participation of all basin states is under serious consideration.

Finally, new institutional mechanisms in the form of joint permanent technical committees have recently been created in southern Africa for the joint planning and development of the water resources shared between the Republic of South Africa and the Front Line States of Angola, Botswana, Lesotho, Mozambique, and Zimbabwe.¹⁰¹ The possibility of cre-

93. Convention and Statutes relating to the Development of the Chad Basin signed at Fort Lamy, May 22, 1964, *reprinted in UN/Africa Water Treaties, supra* note 89, at 8 (establishing the Lake Chad Basin Commission).

94. Earlier treaties include the Treaty of Association, April 19, 1967, Gambia-Senegal (creating an interministerial Committee); April 16, 1976, (establishing a Coordinating Committee); these were substituted for by the Convention relating to the Status of River Gambia and the Convention relating to the creation of the Gambia Basin Development Organization (OMVG) signed at Kaolack, June 30, 1978, Republic of Gambia-Republic of Senegal, *reprinted in UN/Africa Water Treaties, supra* note 89, at 39, 42.

95. Guinea (Konakry) became a party to the Convention by virtue of Resolution of the Conference of Heads of State and Governments of OMVG, June 6, 1981.

96. In June, 1983, in order to allow membership of a non-basin state, art. 15 of the River Gambia Convention, and art. 21 of the Convention establishing OMVG were amended.

97. Agreement for the Establishment of the Organization for the Management and Development of the Kagera River Basin (OBK) signed at Rusumo, August 24, 1977, *reprinted in UN/Africa Water Treaties, supra* note 89 at 32; Uganda became a member of the organization by Agreement of May 19, 1981, *reprinted in UN/Africa Water Treaties, supra* note 89, at 70.

98. The Commission was established by the Agreement of March 3, 1971, and revised by the Protocol of December 22, 1973, between Niger and Nigeria. (Text made available to the author by the Mixed Commission).

100. The Hydromet Project was initiated in 1967 under the auspices of WHO.

101. Agreements establishing a Joint Permanent Technical Committee, August 18, 1979, Kingdom of Swaziland-Republic of South Africa; April, 1983, Mozambique-Swaziland; November, 1982, Botswana-Mozambique; May 8, 1983, Mozambique-Swaziland. (Texts have been made available to the author by the concerned governments).

ating a Limpopo basin organization is under consideration by the governments of Botswana, Mozambique, Zambia, and Zimbabwe, to which South Africa might later accede, and efforts are being made for the creation of basin organizations as regards the Tanganyika River, Zaire, and Zambesi.¹⁰²

Several river commissions have also been created in Central and South America. An interesting example is the Joint Commission for the Integrated Development of the Mirim Lagoon basin shared by Brazil and Uruguay.¹⁰³ Various joint mixed commissions have also been established between El Salvador and Guatemala for Lake Juija;¹⁰⁴ Ecuador and Peru for the Puyango-Tumbes binational project;¹⁰⁵ Argentina and Paraguay on the utilization of the waters of the Pilcomayo river;¹⁰⁶ Argentina and Paraguay for the utilization of hydropower of the Apipe Falls;¹⁰⁷ Bolivia and Peru for the joint utilization of Lake Titicaca;¹⁰⁸ Argentina and Uruguay relating to the utilization of the rapids of Salto Grande;¹⁰⁹ and for the Uruguay River.¹¹⁰

The River Plata Intergovernmental Commission, which was approved in 1968 by a series of agreements between Argentina, Bolivia, Brazil, Paraguay, and Uruguay, was created to coordinate activities involving the largest river basins in South America.¹¹¹ This Commission consists of one delegate from each member state, and has authority granted by

102. These attempts are being made under the sponsorship of the United Nations Economic Commission for Africa and the United Nations Environment Programme.

103. Exchange of Notes for the Establishment of the Joint Commission of Mirim Lagoon Basin (CLM), April 26, 1963, Brazil-Uruguay, 622 U.N.T.S. 259; and of May 20, 1974, 957 U.N.T.S. 255; Treaty of Brasilia, July 7, 1977, D.O. No. 20169 (Uruguay) of January 9, 1978, at 41-A.

104. Agreement on Free Trade and Economic Integration, April 15, 1957, El Salvador-Guatemala, art. 7, 131 U.N.T.S. 132.

105. Agreement on the Utilization of the Binational Basins of Puyango-Tumbes and Catamayo-Chira, September 27, 1971, Ecuador-Peru 385 Registro Oficial (Ecuador) of January 4, 1972, at L.

106. Agreement for the Regulation, Channelling, Dredging, . . . and Maintenance of the River Paraguay, July 15, 1969, Argentina-Paraguay, art. 1, 709 U.N.T.S. 311.

107. Agreement concerning a Study of the Utilization of the Water Power of Apipe Falls, January 23, 1958, Argentina-Paraguay, art. 2-6. 649 U.N.T.S. 175.

108. Agreement concerning the Joint Utilization of the Waters of Lake Titicaca, February 19, 1957, Bolivia-Peru, U.N.T.S. at 168.

109. Agreement concerning the Utilization of the Rapids of the Uruguay River in the Salto Grande Area, December 30, 1946, Argentina-Uruguay, art. 2, 671 U.N.T.S. 17 (revised Nov. 26, 1958 and Oct. 20, 1972).

110. Agreement concerning the Statute of the Uruguay River, February 26, 1975, Argentina-Uruguay, Comision Mixta de Salto Grande, *Documentos y Antecedentes* (April 1981).

111. The regional system of the Rio de la Plata was brought into being at successive meetings of the ministers for foreign affairs of Argentina, Bolivia, Brazil, Paraguay, and Uruguay. At the first of these meetings in Buenos Aires, April 24, 1967, a basin-level coordinating system was created; at the second meeting at Santa Cruz de la Sierra, Bolivia, May 18-20, 1968, the Statutes of the Committee were approved; at the third meeting in Brasilia, April 24-5, 1969, the La Plata Basin Organization was institutionalized with the Treaty of the Plata River Basin, 8 I.L.M., Current Documents 905 (1969).

the Council of Foreign Ministers. The purpose of the River Plata Commission is to provide general directives for the development of the Plata basin, especially with respect to navigation and hydropower. The Commission provides the usual data gathering, consultation facilities, exchange of information, and other related services.

The Amazon Cooperation Treaty was signed in 1978 by Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam, and Venezuela.¹¹² The Treaty applies to the entire Amazon basin, and also to certain territories which are considered closely related to the basin because of their geographical, ecological, and economic characteristics. The party states may carry out projects in their territories in accordance with the principle of good and friendly neighborly relations and international legal restrictions. The organs of the Amazon Treaty are the Meeting of the Ministers of Foreign Affairs, the Amazon Cooperation Council (consisting of senior diplomats of the member states), and the Secretariat to be provided by the state hosting the meeting of the Council. Unanimity is required for decisions taken by the Meeting of Ministers and by the Council.

CONCLUSION

The use, administration, and protection of water resources in international relations can be satisfactorily regulated only by specific arrangements establishing some kind of permanent cooperation between the states concerned. Specific arrangements are required because each river basin or system has its own peculiarities; general rules of international law cannot cope with such a differentiated reality. Agreements on the allocation of costs and benefits are sufficient to determine each state's share and responsibilities without the support of appropriate joint institutions to deal with the increasingly complex problems of common water management. General rules, however, emphasize the interdependence of states' interests in optimum utilization of the world's water resources in a global perspective. Progress achieved thus far in the use, administration, and protection of international water resources shows that the most sensible line of action would be to expand and improve on existing mechanisms of intergovernmental cooperation by strengthening or creating international administration.

112. Treaty for Amazonian Cooperation (TAC) signed in Brasilia on July 3, 1978, 17 I.L.M. 1045 (1978). For an historical account of this treaty see Landau, *The Treaty for Amazonian Cooperation: A Bold New Instrument for Development*, 10 GA. J. INT'L & COMP. L. 467 (1980).