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Third report on the law of the non-navigational uses of international watercourses, by Mr. Stephen M. Schwebel, Special Rapporteur

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THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES

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CONTENTS

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CHAPTER I

Status of work on the topic

A. The Special Rapporteur's previous reports

1. In 1979, in the course of the thirty-first session of the International Law Commission, the Special Rapporteur presented his first report on the law of the non-navigational uses of international watercourses.[1] The report above all endeavoured to demonstrate, with respect to this unique topic, the necessity of aligning legal rules with the physical laws governing water's ubiquitous behaviour. To that end, considerable background data were provided to the Commission describing the operation of the hydrologic cycle. The report also explored the questions of scope and appropriate conceptual basis for the Commission's work, which had already come under scrutiny within the Commission and in the Sixth Committee of the General Assembly.[2] The divergence and convergence of those prior views were examined and a proposed manner of proceeding was suggested to the Commission together with initial draft articles of a possible framework convention—articles which were introduced on a tentative basis as food for thought rather than Commission disposition. Possible definitions of the term "international watercourse" were reviewed.

2. Comment in the Commission and in the Sixth Committee on the first report was considerable and instructive.[3] Delay in arriving at a specific content for or definition of the term "international watercourse" caused some concern, but the approach of a "framework instrument"[4] received broad support. States would be free and even encouraged to conclude specific agreements tailored to the unique characteristics and needs of particular international watercourses. The predominant view was that the product of the Commission's work should serve to provide, except for navigational uses, the general principles and rules governing international watercourses in the absence of agreement among the States concerned and to provide guidelines for the negotiation of future specific agreements. That is, the Commission's articles would contain general principles plus residual rules applicable to subject matters not covered by such agreements. Interest was expressed by some members of the Commission and of the Sixth Committee, as well as by the Special Rapporteur, in proceeding initially to codify and to develop the principles and rules pertaining to specific uses, but the view which prevailed was that the codification and progressive development first of general principles and rules would place the Commission's work on the most acceptable foundation.[5]

3. The Special Rapporteur accordingly prepared a second report for consideration by the Commission at its thirty-second session.[6] The comments on the first report by Commission members, and by delegations that had addressed the topic at the thirty-fourth session of the General Assembly, were taken into account. The articles tentatively submitted in the first report were substantially revised to adopt a "systems" approach to international watercourses, which was found to be especially suitable to the topic.[7] A bracketed article on the meaning of terms, offering for the time being alternative delineations of "international watercourse system", and a draft article on water of international watercourses as a shared natural resource were added to the draft articles proposed.[8]

B. Action by the Commission approving draft articles

4. Consideration of that second report within the Commission during its thirty-second session yielded much valuable comment and substantial progress. The Commission, on the proposal of its Drafting

[1] *Yearbook . . . 1979*, vol. II (Part One), p. 143, document A/CN.4/320.

[2] For an historical review of the work of the Commission on this topic, see the report of the Commission on the work of its thirty-second session, *Yearbook . . . 1980*, vol. II (Part Two), pp. 104–108, and United Nations, *The Work of the International Law Commission*, 3rd ed., (Sales No. E.80.V.11), pp. 91–94.

[3] See *Yearbook . . . 1979*, vol. I, pp. 104–116, 1554th and 1555th meetings, and "Topical summary, prepared by the Secretariat, of the discussion on the report of the International Law Commission, held in the Sixth Committee during the thirty-fourth session of the General Assembly" (A/CN.4/L.311).

[4] The final form of the draft articles will as usual be decided only at a later stage in the Commission's work on the topic.

[5] *Yearbook . . . 1980*, vol. II (Part One), pp. 161–163, document A/CN.4/332 and Add. 1, paras. 6–26.

At its 1980 session, the Commission commenced its work on the topic

"by preparing draft articles for inclusion in a set of articles containing basic rules applicable to all international watercourse systems. These were to be coupled with distinct and more detailed agreements between States of an international watercourse system, which would take into account their needs and the characteristics of that particular watercourse system. At this stage in the work, the Commission intends to devote attention to the formulation of general, residual rules on the topic, designed to be complemented by other agreements which, when the States concerned choose to conclude them, will enable States of a particular watercourse system to establish more detailed arrangements and obligations governing its use." (*Yearbook . . . 1980*, vol. II (Part Two), p. 109, para. 96).

[6] *Yearbook . . . 1980*, vol. II (Part One), p. 159, document A/CN.4/332 and Add.1.

[7] For the full exposition of the Special Rapporteur's process of reconsideration of the articles previously submitted, *ibid.*, p. 164, document A/CN.4/332 and Add.1, chap. II.

[8] On water as a shared natural resource, *ibid.*, p. 180, document A/CN.4/332 and Add.1, chap. III.

Committee,[9] produced six draft articles and a "note" of understanding, with commentaries, for inclusion in its report on the work of its thirty-second session to the General Assembly.[10]

5. The Commission thus provisionally adopted draft articles 1 to 5 and article X. These articles cover scope, system States, system agreements, parties to the negotiation and conclusion of system agreements, use of water of international watercourses which constitutes a shared natural resource, and the relationship between the present articles and other treaties in force, respectively. The first five articles were revisions of equivalent articles proposed by the Special Rapporteur.[11] The additional article, labelled "X" for the time being, was put forward in order to make clear "that treaties in force" respecting particular international watercourse systems were not affected by the provisions of the articles on the topic.[12]

6. The Drafting Committee omitted a recommendation with respect to the proposed new draft article on "collection and exchange of information"[13] because it concluded that there was insufficient time to deal adequately with the issues raised by such an important matter.

7. In 1976 there had been general agreement in the Commission that determination of the extent of the term "international watercourses" was not required at the outset of the work.[14] At the thirty-second session in 1980, however, particularly in view of the use of the term "international watercourse system" in the draft articles, the Commission decided that it was now opportune to prepare a provisional indication of what the Commission meant by "watercourse system" and "international watercourse system". No definitive definition was attempted. Instead, a working hypothesis, subject to refinement and change, was arrived at, "which would give those who were called upon to compose and criticize the draft articles an indication of their scope".[15] The Commission therefore prepared the following note indicating its tentative understanding of the term "international watercourse system":

Note

A watercourse system is formed of hydrographic components such as rivers, lakes, canals, glaciers and groundwater constituting by virtue of their physical relationship a unitary whole; thus, any use affecting waters in one part of the system may affect waters in another part.

An "international watercourse system" is a watercourse system, components of which are situated in two or more States.

To the extent that parts of the waters in one State are not affected by or do not affect uses of waters in another State, they shall not be treated as being included in the international watercourse system. Thus, to the extent that the uses of the waters of the system have an effect on one another, to that extent the system is international, but only to that extent; accordingly, there is not an absolute, but a relative, international character of the watercourse.[16]

8. The importance of this initiative of the Commission and of the articles adopted justifies setting forth the language of these texts in full as the point of departure for additional articles. Moreover, that will facilitate evaluation of any suggestions for possible further refinement of the draft articles adopted in the light of comments at the thirty-fifth session of the General Assembly (see paras 10 *et seq.*, below), further study of State practice and the perceived imperatives of progressive development of the topic.

Draft articles on the law of the non-navigational uses of international watercourses

Article 1. Scope of the present articles

1. The present articles apply to uses of international watercourse systems and of their waters for purposes other than navigation and to measures of conservation related to the uses of those watercourse systems and their waters.

2. The use of the waters of international watercourse systems for navigation is not within the scope of the present articles except in so far as other uses of the waters affect navigation or are affected by navigation.

Article 2. System States

For the purposes of the present articles, a State in whose territory part of the waters of an international watercourse system exists is a system State.

Article 3. System agreements

1. A system agreement is an agreement between two or more system States which applies and adjusts the provisions of the present articles to the characteristics and uses of a particular international watercourse system or part thereof.

2. A system agreement shall define the waters to which it applies. It may be entered into with respect to an entire international watercourse system, or with respect to any part thereof or particular project, programme or use provided that the use by one or more other system States of the waters of an international watercourse system is not, to an appreciable extent, affected adversely.

3. In so far as the uses of an international watercourse system may require, system States shall negotiate in good faith for the purpose of concluding one or more system agreements.

Article 4. Parties to the negotiation and conclusion of system agreements

1. Every system State of an international watercourse system is entitled to participate in the negotiation of and to become a party to any system agreement that applies to that international watercourse system as a whole.

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[9] Composed of Mr. Barboza, Mr. Díaz González, Mr. Evensen, Mr. Jagota, Mr. Reuter, Mr. Tsuruoka, Mr. Ushakov, Sir Francis Vallat and the Special Rapporteur, with Mr. Verosta as Chairman; Mr. Yankov, Rapporteur of the Commission, and Mr. Riphagen also participated.

[10] *Yearbook . . . 1980*, vol. II (Part Two), pp. 108–136. Since, in the process of arriving at the language of the articles as initially approved and reported to the General Assembly, differences within the Commission were largely composed with the assistance of the Drafting Committee, observations upon the comments addressed to the precise terms of the articles in the Special Rapporteur's second report do not appear useful. Nonetheless, in support of the new texts brought before the Commission in this third report, specific mention will be made of comment that has influenced the Special Rapporteur's ultimate thinking.

[11] *Yearbook . . . 1980*, vol. II (Part One), pp. 167–178 and 180–198, document A/CN.4/332 and Add.1, paras. 52–63, 64–123, and 140–239

[12] *Official Records of the General Assembly, Thirty-fifth Session, Sixth Committee*, 25th meeting, para. 58.

[13] Art. 6 in the Special Rapporteur's second report. See *Yearbook. . .1980*, vol. II (Part One), pp. 178–180, document A/CN.4/339 and Add.1, paras. 124–139

[14] *Yearbook . . . 1976*, vol. II (Part Two), p. 162, para. 164.

[15] *Yearbook . . . 1980*, vol. II (Part Two), p. 108, para. 89.

[16] *Ibid.*, para. 90. For the substantive elucidation of the note by the Commission and the text of the six draft articles, with commentaries thereto, *ibid.*, pp. 109–136, paras. 91–98.

2. A system State whose use of the waters of an international watercourse system may be affected to an appreciable extent by the implementation of a proposed system agreement that applies only to a part of the system or to a particular project, programme or use is entitled to participate in the negotiation of such an agreement, to the extent that its use is thereby affected, pursuant to article 3 of the present articles.

Article 5. Use of waters which constitute a shared natural resource

1. To the extent that the use of waters of an international watercourse system in the territory of one system State affects the use of waters of the system in the territory of another system State, the waters are, for the purposes of the present articles, a shared natural resource.

2. Waters of an international watercourse system which constitute a shared natural resource shall be used by a system State in accordance with the present articles.

Article X. Relationship between the present articles and other treaties in force

Without prejudice to paragraph 3 of article 3, the provisions of the present articles do not affect treaties in force relating to a particular international watercourse system or any part thereof or particular project, programme or use.

9. Within the Commission some difference of view persists with respect to, above all, the systems approach. However, all Commission members present but one approved the note above (para. 7) as submitted to the General Assembly. The opposing member regarded some of the terms, such as "hydrographic components", as lacking in specificity and partaking of "pseudo-scientific speculation"; he also felt that the treatment of a watercourse as international for some purposes but not for other purposes would lead to uncertainty and difficulty in application.[17]

C. Comment in the Sixth Committee of the General Assembly

1. General comment and comment on the systems approach

10. The Sixth Committee of the General Assembly at its thirty-fifth session devoted significant attention to the law of the non-navigational uses of international watercourses, dealt with in chapter V of the Commission's 1980 report.[18] Most of the comment was favourable. It was said that notable progress had been achieved in laying down an acceptable basis for further work on an exceptionally sensitive area of international law; the supporting legal and technical documentation was regarded as most valuable. For example, the delegation of Egypt endorsed the method adopted by the Commission, which it found to be "based on the principle of goodwill, the positive use of law, humanitarian concerns, co-operation among the user States of watercourses and their responsibilities in the context of fundamental rules".[19] The representative of Yugoslavia found the Commission's basis generally acceptable and "the working hypothesis defining the term 'international watercourse system' acceptable and suitable".[20] The representative of Italy, besides announcing his delegation's support for the concept of an international watercourse as adopted provisionally by the Commission and its preference for "international watercourse system" over the traditional notion of international river, emphasized the topic's "particular importance to newly independent countries, which could benefit greatly from the formulation of a series of equitable principles that could form the basis of agreements governing the use of the available resources".[21] The representative of Canada, in turn, stressed his delegation's view that the Commission must "be at the forefront of the development of new law and the promotion of new ideas", as well as engage in codification, and that the codification and progressive development of international law in the area of non-navigational uses of international watercourses "would be of great benefit to all Member States of the United Nations".[22] The representative of Sudan indicated that her delegation "had no difficulty in accepting [the provisional definition of 'international watercourse system'], without prejudice to its right to express reservations on any future amendments". Her delegation "also agreed with the formulation of 'basic general principles applicable to all international watercourse systems, but thought that the specific needs of riparian States and the physical and natural characteristics of different watercourses should also be taken into account".[23] The representative of Argentina submitted that the law of non-navigational uses of international watercourses "was perhaps the most important topic before the Commission"; the international community "had become aware that the world's resources were limited and that countries sharing natural resources such as water should seek to ensure their equitable and rational use".[24] A number of other comments supported these views. Moreover, it was stressed that a balance must be maintained between the requirements of sovereignty and the requirements of good-neighbourliness and the prohibition of abuses.[25]

11. At the same time, there were also some representatives who found the progress inadequate or the approach of the draft articles and note of understanding ill-advised. The representative of Poland felt that the term "international watercourse" still had not been

[17] *Ibid.*, p. 109, para. 94; see also *Official Records of the General Assembly, Thirty-fifth Session, Sixth Committee*, 25th meeting, para. 50.

[18] See "Topical summary, prepared by the Secretariat, of the discussion of the report of the International Law Commission in the Sixth Committee during the thirty-fifth session of the General Assembly" (A/CN.4/L.326), paras. 229–310.

[19] *Official Records of the General Assembly, Thirty-fifth Session, Sixth Committee*, 56th meeting, para. 66. See also the evaluation of the respresentative of Nigeria (*ibid.*, 53rd meeting, paras. 10–12).

[20] *Ibid.*, 59th meeting, para. 34.

[21] *Ibid.*, 53rd meeting, paras. 19 and 20.

[22] *Ibid.*, 51st meeting, para. 21.

[23] *Ibid.*, 59th meeting, para. 36. The "framework instrument" approach, introduced in the first report and well received in the Sixth Committee in 1979, had been adopted precisely to meet the needs here emphasized. In 1980, comment on this point was limited but again favourable. See e.g. the statements of the following delegations: Tunisia, *ibid.*, para. 29; Spain, *ibid.*, 55th meeting, para. 17; Canada, *ibid.*, 51st meeting, paras. 23–24.

[24] *Ibid.*, 57th meeting, para. 15.

[25] *Ibid.*, 53rd meeting, para. 19 (Italy). However, the representative of the German Democratic Republic said that his country supported the view that every State had the sovereign right to decide the uses of watercourses in its territory, and was therefore opposed to any provision that made the uses of inland waters subject to the law of non-navigational uses of international watercourses (*ibid.*, 52nd meeting, para. 1). As expressed, that view would seem to deprive the topic under study of any reach whatsoever, which could not have been the General Assembly's expectation in requesting the Commission to undertake its codification and progressive development.

clarified and that the hypothesis of an international watercourse system based on the hydrographic elements "had not solved the problems involved in the creation of legal norms relating to international rivers, lakes or canals which formed or traversed international boundaries". He explained the constant increase in the number of bilateral agreements on the subject since the Second World War in part by "the need to settle many new technological problems".[26] The representative of Romania expressed the opinion that "the new concepts, based on the idea of a 'system', did not seem to be substantiated by State practice"; he reaffirmed on behalf of his delegation that "the problems of the utilization of international waters must be tackled in the light of the principles of international law concerning friendly relations and co-operation among States in accordance with the Charter of the United Nations, which must be strictly observed".[27] The representative of Afghanistan stated that non-navigational uses of international waterways "had always been considered at the regional level, in the light of particular geographical or other requirements"; moreover, "the new concepts formulated by the Commission, based on the notion of systems, had no antecedents in State practice".[28] The representative of Bangladesh, however, did not share these criticisms, but rather foresaw "difficulties arising in the interpretation of the term 'international watercourse system'" because the Commission's note made it clear that "the watercourse was not absolutely but relatively international in character"; he pointed out moreover that it was "important to ensure that a watercourse passing from one State to another, or through many States, was given an international character, and that any diversion or any other use of water which was in any way detrimental to any State should be made absolutely illegal".[29]

12. Criticism of the Commission draft was expressed by the representative of Kenya, who said that his delegation considered it "essential that a functional definition of the international watercourse system" be produced, while recognizing the difficulties involved; his delegation was not in favour of the suggestion that "the entire international drainage basin, consisting of tributaries, lakes and canals, should be included . . . His delegation believed that every State should be able fully to utilize water within its territory for legitimate means and without external pressure, provided that it allowed an adequate volume of water to flow on to the other riparian States".[30] The representative of Spain reported that his Government had "serious misgivings" about the approach embodied in the concept of "international watercourse system", although "Spain believed that States sharing an international watercourse had an obligation to take due account of the interests of other riparian States".[31] The representative of Pakistan said that his delegation "regretted that the International Law Commission had not been able to agree on the adoption of a definition of an international watercourse".[32] The representative of Tunisia, while generally praising the Commission's progress, found lacking, "norms for solving technical problems or settling controversies which might arise" as well as a provision "prohibiting pollution of watercourses or at least obliging States to take all possible precautions to avoid it".[33] The representative of Finland warned that "no final choice of a term [to express the basic concept] could be made before the Commission had examined the relevant factors determining the scope of the future framework treaty," and that that study "could not be postponed indefinitely".[34]

13. The observation of the representative of Iraq may serve to epitomize the general feeling of many, if not most, of the delegation:

> It should be recognized that the complex and highly technical nature of the subject and its strong correlation to vital State interests did not make for easy solutions. The process of bringing about compatibility between the conflicting interests of States in order to draw up the general principles of a convention containing residuary rules was a very long one, and consequently expressions of dissatisfaction would probably still be heard for some time to come until a final all-embracing solution was found.[35]

14. The introduction of the concept of "system" into the draft provoked the most comment from representatives in the Sixth Committee. As indicated above, some representatives supported the new conceptual framework thereby provided, regarding it as useful or even a distinct advance.[36] To those to whom the systems approach was acceptable, the employment of the terms "international watercourse system" and "system State" gave no difficulty, although some felt a need for more clearly identifying the elements or components of the system and, in due course, spelling out the implications in terms of specific legal rules.[37] At least one representative, who had previously objected to consideration of the drainage basin concept, found "system" tantamount to "basin" and consequently opposed the Commission's decision to employ the terms "international watercourse system" and "system State".[38] The reaction in the Assembly, in spite of limited explicit dissent,[39] was fundamentally receptive

[26] *Ibid.*, 58th meeting, para. 19.

[27] *Ibid.*, 50th meeting, paras. 5 and 7.

[28] *Ibid.*, 60th meeting, paras. 4 and 6.

[29] *Ibid.*, 59th meeting, para. 48.

[30] *Ibid.*, 56th meeting, para. 61.

[31] *Ibid.*, 55th meeting, para. 17.

[32] *Ibid.*, 58th meeting, para. 9.

[33] *Ibid.*, para. 30.

[34] *Ibid.*, 48th meeting, para. 58. Finland was also concerned that the Commission realize that its most important goal was the codification of material rules applicable in all cases when needed, irrespective of the existence of any supplementary agreement (*ibid.*, para. 59).

[35] *Ibid.*, 54th meeting, para. 7.

[36] See in this connection the remarks of the representative of India (*ibid.*, para. 41). See also the observations of the representatives of Algeria (*ibid.*, 55th meeting, para. 34) Sri Lanka (*ibid.*, 52nd meeting, para. 57), Argentina (*ibid.*, 57th meeting, paras. 16–17), and the United States of America (*ibid.*, 56th meeting, para. 19).

[37] See e.g. the observations of the representative of Tunisia (*ibid.*, 58th meeting, para. 30). The representative of the Ukrainian SSR found shortcomings in that the complex concept of the system of international watercourses should be the subject of a precise definition; to be useful the definition should identify the elements of the system and explain the relationship between them (*ibid.*, 56th meeting, para. 39). The representative of Nigeria, on the other hand, noted that the term "system" had already been employed in a number of treaties and had its scientific connotation in its favour (*ibid.*, 53rd meeting, para. 11).

[38] See the remarks of the representative of Brazil (*ibid.*, 51st meeting, paras. 29–30).

[39] It should be noted that the representative of the USSR said it would be preferable to retain the expression "international watercourse", which could be defined on the basis of existing international law; he reported that his delegation found the Commission's definition of "international watercourse system" totally unsatisfactory (*ibid.*, 52nd meeting, para. 74).

to the Commission's working hypothesis and to the essential approach embodied in the draft articles so far adopted by the Commission.

2. Scope of the articles

15. Observations directed to article 1, "Scope of the present articles", in large part focused on the term "international watercourse systems", comment with respect to which has been reviewed above. In addition, however, one representative found the language of the second part of paragraph 1 ("measures of conservation related to the uses of those watercourse systems and their waters") unclear. He pointed out that flood control and flow regulation, for instance, were not uses in the ordinary sense, nor were they strictly speaking conservation measures related to the uses.[40]

16. Paragraph 2 of article 1, dealing with the relationship between the Commission's articles and navigational uses, received slightly more attention. One representative noted that the situation of non-navigational uses affecting navigational uses, and vice versa, might often occur.[41] Another representative declared that his delegation wanted to give further study to the provision, since it had the indirect effect of bringing navigational uses within the scope of these articles.[42] It may be fair to say that, subject to some clarification, the language of article 1 was found acceptable by most delegations.

17. Similarly, article 2, defining "system State", met with general approval, except from those opposed to the notion of system altogether. The language was found sufficiently concise to leave no room for ambiguity by one representative.[43] There was some feeling, however, that the concept of "system State" was not clearly defined by the article.[44]

3. System agreements

18. The underlying rationale of article 3, "System agreements", was welcomed by a good number of representatives. Article 3 expresses in normative terms the "framework instrument" approach broadly commended in the Sixth Committee in 1979 (see para. 2 above) and again in 1980. For example, the wording of article 3 was held to allow sufficient latitude to the system States on all or part of an international watercourse system; it had the advantage also of allowing agreements pertaining to subsystems, which might differ from each other a great deal.[45] With few exceptions, paragraph 1 of the article was well received.[46]

19. With respect to paragraph 2 of article 3, however, concern was expressed by several representatives. Since States should not in general conclude treaties or take measures unilaterally that adversely affect a third party's interests, the clause concerning limited system agreements was not quite clear, according to the representative of Finland.[47] The representative of Ethiopia took the position that as a matter of principle the right of all riparian States to participate in any negotiation on a system agreement should not be qualified; he thus opposed inclusion of the term "appreciable extent", stating that it would create unnecessary problems of interpretation.[48] The terms "appreciable extent" and "affected adversely" were also regarded by some other representatives as hard to define and likely to cause problems of interpretation.[49]

20. Other representatives found no problem with paragraph 2 of the article. It was observed that the expression "to an appreciable extent", as employed in that paragraph, provided added flexibility, giving greater opportunity to system States to raise objections if their use of the waters was adversely affected.[50] The view widely espoused by specialists in international water resources, that the best way of dealing with a watercourse is as a whole, found support in the Sixth Committee as it had in the Commission; the examples of the Amazon, the Plata, the Niger and the Chad basins were cited. But it was said that agreements of a general nature did not inhibit the parties from entering into specific or partial agreements, in line with the general development objectives of the basins in question; nevertheless, there were some issues arising out of watercourse pollution that necessitated co-operative action on the part of all riparian States and required unified treatment and the conclusion of agreements among the parties concerned; this was an obligation that flowed from customary international law.[51]

21. With regard to paragraph 3 of article 3, setting forth the obligation to negotiate in good faith, some representatives, in approving it, treated it as a special application of the principle recognized in Article 33 of the Charter of the United Nations, which provides for negotiation as one of the methods of peaceful settlement of international disputes.[52] One delegation was of the opinion that the Commission had concluded, by the language of paragraph 3, that a general principle of international law existed requiring negotiation generally among States in dealing with international fresh water resources, rather than only where conflicting interests made negotiation necessary. While not object-

[40] *Ibid.*, 48th meeting, para. 59 (Finland). It was apparent that the representative intended that such matters be within the scope of the articles.

[41] *Ibid.*, 53rd meeting, para. 21 (Italy).

[42] *Ibid.*, 51st meeting, para. 15 (United Kingdom). The third comment, by the representative of Jamaica, was to the effect that the final phrase, "or are affected by navigation", was not relevant since such situations came under the law of State responsibility (*ibid.*, 54th meeting, para. 4).

[43] *Ibid.*, 55th meeting, para. 34 (Algeria).

[44] See the question raised by the representative of Iraq (*ibid.*, 54th meeting, para. 9).

[45] *Ibid.*, 55th meeting, para. 34 (Algeria). See also the suggestion and illustration presented by the representative of Italy in that connection (*ibid.*, 53rd meeting, para. 21).

[46] The representative of the USSR considered the "system agreements" concepts unclear and unacceptable, since it gave certain States in the system "rights" under the articles (*ibid.*, 52nd meeting, para. 74). However, the representative of Nigeria stated that paragraphs 1 and 2 of article 3 created "no legal problems" (*ibid.*, 53rd meeting, para. 11).

[47] *Ibid.*, 48th meeting, para. 60. The representative of Finland went on to say that the Commission still needed to study and elaborate one of the basic principles of international water law, equitable utilization, which would involve it in the classic problem concerning the limits of the sovereign rights of co-riparian States over the water resources within their territories.

[48] *Ibid.*, 51st meeting, para. 50

[49] See the comments of the representative of India, suggesting that "substantial extent" might be preferable (*ibid.*, 54th meeting, para. 44).

[50] *Ibid.*, 59th meeting, para. 48 (Bangladesh).

[51] *Ibid.*, 56th meeting, para. 69 (Egypt).

[52] For example, *ibid.*, 53rd meeting, para. 11 (Nigeria), and 54th meeting, para. 44 (India).

ing to that conclusion, the representative of that delegation pointed out that the obligation to negotiate should be considered not in the abstract but in relation to a dispute or a situation where measures planned or undertaken by one basin State might adversely affect the interest of another basin State; negotiations would thus be necessary to avoid a conflict.[53]

22. However, the very concept of a duty to negotiate seemed likely to conflict with the sovereign rights of every State over its territory and its national resources, in the view of one representative.[54] Another representative posed the question of who would be empowered to say that negotiation "in good faith" of a system agreement was required and commented that the subjective nature of that expression and the expression "to an appreciable extent, affected adversely" (in paragraph 2 of article 3) might make it relatively easy to undermine article X, which purported to preserve other treaties in force.[55] And one delegation considered that it would be very difficult to maintain that the obligation to negotiate system agreements stemmed from customary international law; it must be unequivocally stipulated that the system States were completely free to make such agreements as they considered appropriate.[56]

23. Article 4, "Parties to the negotiation and conclusion of system agreements", received indications of satisfaction but also some expressions of dissatisfaction. One representative found considerable difficulty with the draft articles and the commentary because, among other things, they maintained the position, which his delegation was inclined to support, that there would be no obligation to negotiate where an international watercourse was hardly used; yet the right to participate in negotiations was said to be complementary to the duty to negotiate. Consequently, there could be no question of a third State's having the right to participate in negotiations between States which, because of *their* geographical situation, needed to conclude a watercourse agreement, where that third State was under no duty to negotiate.[57]

24. One representative suggested that, since article 4 left room for serious disagreement, the articles should provide for compulsory recourse for settlement of disputes, such as arbitration, where negotiations on system agreements had been unsuccessful.[58] Some delegations raised technically involved questions but did not challenge the principles contained in the article.[59] On the other hand, the representative of Algeria stated that, although there was the risk of some uncertainty in respect of precisely what constituted an "appreciable extent", he considered the solution in article 4 technically unimpeachable.[60]

25. Paragraph 2 of article 4 provides for the "to an appreciable extent" test, which stimulated discussion there and wherever it occurred in the draft articles. For example, the representative of Nigeria indicated that the criterion already most frequently adopted for determining the extent of the use or enjoyment of an international watercourse was "appreciable extent", which expression in his delegation's view provided an acceptable yardstick. Thus paragraph 2 of the article was considered useful.[61]

26. In summary, it may be said that the Commission's employment of "appreciable extent" brought no more than the anticipated and justifiable concern for the term's indefiniteness but no proposals for a less vague standard. The basic propositions of the article, the entitlement to participate in the negotiation of system agreements and to become a party where the agreement was system-wide, were favourably regarded in the Sixth Committee.

4. Water as a shared natural resource

27. Draft article 5, "Use of waters which constitute a shared natural resource", elicited numerous comments. Some representatives found even the concept "shared natural resource" controversial or without relevance to the topic;[62] one did not object to the concept but felt that the meanings and the elements needed clarification;[63] one expressed the view that "shared natural resource" was perhaps not the most appropriate term to use.[64] The principle of permanent sovereignty over natural resources applied to international watercourses and, even if the waters of such watercourses were to be regarded as a "shared natural resource", a term which the Ethiopian representative did not see as relevant, that principle nevertheless applied.[65] Another representative felt that inclusion of the shared resources concept, the acceptance of which he regarded as without intrinsic value, would make the Commission's work more difficult.[66] The fact that

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[53] *Ibid.*, 48th meeting, para. 59 (Finland).

[54] *Ibid.*, 45th meeting, para. 17 (Federal Republic of Germany).

[55] *Ibid.*, 50th meeting, para. 48 (France).

[56] *Ibid.*, 54th meeting, para. 56 (Turkey). In connection with the duty to negotiate, the representative of Brazil challenged the use in the Commission's commentary of language in the judgment of the International Court of Justice in the *North Sea Continental Shelf* cases to support a duty to negotiate agreements in the area of international watercourses, maintaining that the delimitation of maritime boundaries and the use of international rivers were basically different situations, and that the reference of the International Court of Justice to the "unity of deposits" as a factor to be considered had nothing to do with the obligation to negotiate (*ibid.*, 51st meeting, para. 32).

[57] *Ibid.*, 57th meeting, para. 5 (Honduras). The same representative also raised the issue of what the consequences would be for a third State that did not make timely use of the "opportunity to participate" (*ibid.*, para. 6). The representative of Honduras was also critical of the working hypothesis expressed in the Commission's note of understanding of what was meant by the term "international watercourse system". He drew attention to the alternative idea raised by the Special Rapporteur at the 1556th meeting of the International Law Commission of possibly including in the draft articles an optional clause that would enable States to specify that, as far as they were concerned, the articles applied to successive or contiguous rivers, to river basins or to international drainage basins (*ibid.*, para. 2).

[58] *Ibid.*, 48th meeting, para. 44 (Japan).

[59] See e.g. the statement of the representative of Italy (*ibid.*, 53rd meeting, paras. 21–22).

[60] *Ibid.*, 55th meeting, para. 35. The representative of India expressed agreement with para. 1 of article 4 (*ibid.*, 54th meeting, para. 45).

[61] *Ibid.*, 53rd meeting, para. 12. The representative of Iraq commented upon matters discussed in the commentary to article 4 which can be considered at a later stage (*ibid.*, 54th meeting, paras. 11–12).

[62] See e.g. the observation of the representative of Turkey (*ibid.*, 54th meeting, para. 58).

[63] *Ibid.*, para. 46 (India).

[64] *Ibid.*, para. 4 (Jamaica).

[65] *Ibid.*, 51st meeting, para. 51 (Ethiopia).

[66] *Ibid.*, para. 34 (Brazil). The representative of France hoped that any reference to the idea would be deleted from the articles (*ibid.*, 50th meeting, para. 49).

article 5 supposed the existence of some international watercourse systems that constituted a shared natural resource and others that did not was unsatisfactory to one delegation.[67]

28. Apart from these criticisms and some feeling that the concept of shared natural resources was too new in international practice for the Commission to embrace it, the reception of article 5 was positive. That several United Nations and other bodies had already developed and recommended the concept of shared natural resources was stressed. The delegations that welcomed inclusion of the article saw it as containing the substantive rule governing the use of such waters; it was accepted that an international watercourse system was an archetypical example of shared natural resources, whose use must be regulated in a spirit of equity, co-operation and solidarity. Codification of the notion on the basis of the obligation to co-operate in that sphere, as implied in the Charter of Economic Rights and Duties of States, would make a significant contribution to international law and international co-operation.[68]

29. One delegation, while praising the articles and commentaries presented by the Commission as responding to the expectations of the 1977 United Nations Water Conference with respect to the topic of shared water resources, found the Commission's definition in article 5 perhaps not quite adequate for the purposes of the future framework treaty. The problem was that, if the use of the waters did not have the specified effect within the territory of another State, in accordance with the proposed language, those waters were not considered part of a shared natural resource. Such a narrow definition may require reconsideration. The fact of shared natural resources had long been treated in State practice as giving rise to obligations to co-operate in the treatment of such resources.[69]

30. The representative of a system State in the Mekong considered it illusory to attempt to apply the principle of permanent sovereignty over natural resources to water that flowed in an international watercourse through various successive territories; the concept of a shared natural resource was in such a case inevitable. The representative further stated that unilateral action should give way to consultations and the adoption of concerted measures; the Commission, having reached that important conclusion, would now have to examine the methods and criteria for the use and equitable distribution of shared resources.[70]

5. Relationship to other treaties in force

31. The Commission wished to forestall possible conflicts between the framework articles it was elaborating and the provisions of treaties in force relating to a particular international watercourse system. Accordingly, an article, for the time being called article X, had been propounded stating that the draft articles did not affect such treaties, except that the operation of paragraph 3 of article 3, containing the obligation to negotiate in good faith for the purpose of concluding system agreements, was not prejudiced by this disclaimer.[71] Consequently the article, as a technical clause, was welcomed by some representatives.[72]

32. Other representatives, however, deemed the article to be unsatisfactory, since it gave rise to new problems.[73] One delegation urged the Commission to be careful not to reopen situations that had been settled for the time being by practice or by treaty, and thus wondered whether article X was broad enough.[74] Finally, one delegation stated that without doubt further thought would have to be given to the relationship between article X and other articles, but welcomed the article in question subject to further refinement.[75]

6. Summary of discussion in the Sixth Committee

33. As might be expected when dealing with a subject regarded by one and all as sensitive and difficult, although of vital importance, the views expressed on the topic of the law of the non-navigational uses of international watercourses during the 1980 session of the Sixth Committee were varied. Some delegations appeared to be withholding comment, at least to some extent, perhaps preferring to judge the Commission's work only after a complete set of articles, or at least articles on general principles, had been reported. But many delegations contributed substantive observations on the progress thus far achieved, accepting the virtual necessity of proceeding step by step.

34. Because in 1980 the Commission submitted to the General Assembly for the first time a number of draft articles, comments in the Sixth Committee on those articles, and on the Commission's working hypothesis, have been given relatively extensive treatment in the Special Rapporteur's third report.[76] Clearly, views were expressed in the Sixth Committee on several aspects of the work that are difficult if not impossible to reconcile. Any Special Rapporteur must endeavour to meet, in so far as he can, the apprehensions and criticisms of as many States as possible, while giving appropriate weight to the views and expectations of the large majority. The weight to be accorded majority views is not necessarily determinative in the sphere of progressive development at large, since new international law cannot be imposed upon an unwilling minority. But perhaps majority views carry special weight in a case such as this, in which the majority is truly worldwide, embracing States of diverse geographical, cultural and ideological character. The expectations of the majority in this case appear to embrace codification of the principles and rules of international law on the

[67] *Ibid.*, 52nd meeting, para. 74 (USSR).

[68] See especially the statements of the representatives of Thailand (*ibid.*, 56th meeting, para. 51), Egypt (*ibid.*, para. 72), Algeria (*ibid.*, 55th meeting, para. 36), Argentina (*ibid.*, 57th meeting, paras. 18–20), the United States of America (*ibid.*, 56th meeting, para. 21) and the Netherlands (*ibid.*, 44th meeting, paras. 38–39).

[69] *Ibid.*, 48th meeting, para. 61 (Finland).

[70] *Ibid.*, 56th meeting, para. 51 (Thailand).

[71] The delegation of Bangladesh regarded this limitation on article X to be an important one, stating that if the treaty has been concluded without the free will and consent of a party, or if there had been coercion or intimidation, the "good faith" criterion would not have been met and the treaty would not deserve protection under article X (*ibid.*, 59th meeting, para. 50).

[72] For example, *ibid.*, 54th meeting, para. 59 (Turkey).

[73] *Ibid.*, 52nd meeting, para. 74 (USSR), and 56th meeting, para. 39 (Ukrainian SSR).

[74] *Ibid.*, 45th meeting, para. 17 (Federal Republic of Germany).

[75] *Ibid.*, 51st meeting, para. 15 (United Kingdom).

[76] For a fuller exposition, see "Topical summary . . ." (A/CN.4/L.326).

topic, and the progressive development as well of principles and rules calculated to serve the pressing needs of States in various stages of development, of a deteriorating environment, and of an increasingly interdependent world. As always, the elements and expressions of progressive development must be most carefully assembled, delimited, and drafted. But such provisions must not be foreclosed or unduly weakened simply because of some statements of the obvious, that is, that they have not yet become accepted international law.

35. It is submitted that the Commission is entitled to interpret the record of discussion at the thirty-fifth session of the General Assembly as predominant affirmation of the essential soundness of its basic approach and of the progress achieved thus far. It was fully recognized by the Sixth Committee that the work submitted so far on the topic was tentative and incomplete, and that the Commission would in due course reconsider each of its draft articles in light of the comments of States and its further study. In so doing, the Commission will naturally give the fullest consideration to the points of criticism made by a number of representatives in the Sixth Committee.

7. Action by the General Assembly

36. The report of the Sixth Committee on its consideration, at the thirty-fifth session of the General Assembly, of the report of the Commission on the work of its thirty-second session,[77] contained a draft resolution proposed for adoption by the Assembly. The draft resolution emphasized "the need for the progressive development of international law and its codification" and noted "with appreciation the progress made by the International Law Commission in the preparation of draft articles on the law of the non-navigational uses of international watercourses". It approved the programme of work planned by the Commission for 1981 and recommended that the Commission "proceed with the preparation of draft articles" on the topic of international watercourses.[78] The draft resolution, adopted by consensus in plenary meeting on 15 December 1980, became General Assembly resolution 35/163.

[77] *Official Records of the General Assembly, Thirty-fifth Session, Annexes*, agenda item 106, document A/35/71.

[78] *Ibid.*, para. 8.

Chapter II

Additional draft general principles

A. Desirability of presenting a more complete set of draft articles

37. Some members of the Sixth Committee, as well as of the Commission itself, expressed the desire to have before them a relatively full set of the general articles that the Commission, or at least the Special Rapporteur, had in mind,[79] before committing themselves to a particular approach to this singularly difficult topic. The principles and rules of international law in this field are clearly interrelated. Appraisal of any one general norm depends to some extent upon the norms imbedded in other articles. With a more complete set of draft articles all concerned could perceive the important interrelationships and ramifications as well as evaluate more confidently the essential approach pursued. These considerations are persuasive. Accordingly, the following sections (together with his earlier reports) constitute a best effort under the circumstances to lay before a successor Special Rapporteur and the Commission a picture of the salient general principles and rules of the law of the non-navigational uses of international watercourses as these have come to be understood by the Special Rapporteur.

38. In this, his last report, then, the Special Rapporteur endeavours to set forth certain of the most basic principles and rules regarded as necessary to complete the expression of his findings to date on the topic assigned to him. In an effort not to obscure this hopefully rounded whole, and for want of time, the documentation for these additional propositions has largely been pared down to the most indicative of current State practice and the most fruitful and cogent sources for undertaking a progressive development of the law. The fact that the Special Rapporteur will no longer enjoy responsibility for the topic leads him to advance his suggestions in a particularly tentative, and at some points skeletal form, in the knowledge that they will inevitably benefit from the reconsideration of a successor Special Rapporteur and the critical analysis of the Commission.

39. Articles on equitable utilization are initially presented, followed by an article on the fundamental and yet intricate principle of responsibility for appreciable harm. An article on information and data, which was put forward in the Special Rapporteur's first and second reports in tentative form, has been reconsidered, recast and also is included. Finally, problems of environmental protection and of pollution, and of the control of hazards and harmful effects, are addressed.

40. A third chapter sketches remaining subtopics believed by the Special Rapporteur to give rise to pertinent general principles and rules, but for which it was not possible to condense and fully assemble the multifaceted and voluminous State practice and professional literature in time for submission of this report. Included are river regulation, hydraulic installations and water security, interaction with navigational uses, administrative arrangements for international watercourse systems, and dispute settlement and avoidance. The very tentative articles suggested, which are undoubtedly especially in need of further work, are nonetheless, as with the previous articles submitted,

[79] See, for example, the concern expressed by Sir Francis Vallat at the 1555th meeting of the Commission (*Yearbook . . . 1979*, vol. I, p. 116, para. 34). See also the remarks of Mr. Reuter (*Yearbook . . . 1980*, vol. I, p. 127, 1607th meeting, para. 25); of Mr. Barboza (*ibid.*, p. 133, 1608th meeting, para. 33); of Mr. Francis (*ibid.*, p. 136, 1609th meeting, para. 18); and of Mr. Tsuruoka (*ibid.*, p. 140, 1610th meeting, para. 6).

the product of study of State practice and of the challenges facing system States with respect to the development, use, protection and control of their shared water resources.

B. The concept of "equitable participation"

41. Within its own territory, a State is indubitably entitled to make use of the waters of an international watercourse system with respect to which it is a system State. This entitlement is not only an attribute of sovereignty but also, in the case of shared resources, may be grounded in the fundamental principle of "equality of right".[80] Each system State enjoys this right of course, but, where the quantity or quality of the water is such that all the reasonable and beneficial uses of all the system States cannot be realized to their full extent, what is termed a "conflict of uses" results. International practice then recognizes that some adjustments or accommodations are required in order to preserve each system State's equality of right. Such adjustments or accommodations are to be calculated on the basis of equity,[81] failing specific agreement with respect to each system State's "share" in the uses of the waters. Indeed, a number of international agreements expressly or implicitly apply this "equitable share" concept, which may be seen as evidence of the force of the principle in customary international law.[82]

42. There may be, aside from the rule that no State may cause appreciable harm to another State, no more widely accepted principle in the law of the non-navigational uses of international watercourses than that each system State "is entitled, within its territory, to a reasonable and equitable share of the beneficial uses of the waters".[83]

1. Development of the general principle

43. The general principle, while perhaps not ancient, is not of recent origin. Its emergence is involved with such resolution as there is of the long-standing conflict among competing theories in this realm—territorial integrity, absolute sovereignty, limited territorial sovereignty, and community in the waters[84]—and can be seen to have evolved gradually into its contemporary expression: equitable utilization.

44. Early formulations of the doctrine can be found in national practice, particularly in connection with adjudications within federal States. Initially it was linked with a finding of injury. In 1927, the Constitutional Law Court of Germany declared as a matter of international law that "no State may substantially impair the natural use of the flow of such [an international] river by its neighbour".[85] But the Court went beyond the "duty not to injure the interests of other members of the international community":

> The application of this principle is governed by the circumstances of each particular case. The interests of the States in question must be weighed in an equitable manner against one another. One must consider not only the absolute injury caused to the neighbouring State, but also the relation of the advantage gained by one to the injury caused to the other.[86]

45. The Supreme Court of the United States of America, in deciding interstate river disputes between states of the Union, treats the litigants as if sovereign, and therefore applies what it regards to be the international law on the subject matter.[87] So acting, the Court concluded in 1907, for example, that there must be adjustment "upon the basis of equality of rights as to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effects of a flowing stream".[88] And where the Court could find no need in the State of Washington for the waters in question, it determined that the State of Oregon's diversion during water-scarce times of all the Walla Walla River's flow was not necessarily inconsistent with the principle of equality of right.[89]

46. The Italian Court of Cassation delivered an opinion in connection with an international watercourse, the River Roya, regulated under a treaty between France and Italy, which expresses the principle without using the precise terms:

> International law recognizes the right on the part of every riparian State to enjoy, as a participant of a kind of partnership created by the river, all the advantages deriving from it for the purpose of securing the welfare and the economic and civil progress of the nation . . . However, although a State, in the exercise of its right of sovereignty, may subject public rivers to whatever regime it deems best, it cannot disregard the international duty, derived from that principle, not to impede or to destroy, as a result of this regime, the opportunity of the

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[80] See the major study by J. Lipper, "Equitable utilization", *The Law of International Drainage Basins*, A. H. Garretson, R. D. Hayton and C. J. Olmstead, eds. (Dobbs Ferry, N.Y., Oceana Publications, 1967), pp. 15–88, especially pp. 23–38 and 44–47.

[81] If the States are in disagreement over the scope of their rights of utilization, settlement will take place on the basis of equity, taking particular account of their respective needs, as well as of other pertinent circumstances" (art. 3 of the resolution on "utilization of non-maritime international waters (except for navigation)" adopted by the Institute of International Law at its Salzburg session in September 1961). Art. 2 of that resolution provides:

> "Every State has the right to utilize waters which traverse or border its territory, subject to the limits imposed by international law and, in particular, those resulting from the provisions which follow.
>
> "This right is limited by the right of utilization of other States interested in the same watercourse or hydrographic basin" (*Annuaire de l'Institut de droit international, 1961* (Basel), vol. 49, t. II, p. 382; see also *Yearbook . . . 1974*, vol. II (Part Two), p. 202, document A/5409, para. 1076).

[82] Concerning the impact of the principle on the Columbia River Treaty and Protocol of 1964 (Canada–United States of America), see R. W. Johnson, "The Columbia Basin", *The Law of International Drainage Basins* (*op cit.*), pp. 167–170, 203–207, 234–240.

[83] This is the formulation used in art. IV of the "Helsinki Rules on the Uses of the Waters of International Rivers" (ILA, *Report of the Fifty-second Conference, Helsinki, 1966* (London, 1967), p. 486; see also *Yearbook . . . 1974*, vol. II (Part Two), pp. 357–359, document A/CN.4/274, para. 405).

[84] For a review of these doctrines, see J. Berberis, *Los recursos naturales compartidos entre estados y el derecho internacional* (Madrid, Técnos, 1979), pp. 16–23, and Lipper, *loc. cit.*, pp. 16–40.

[85] *Württemberg and Prussia* v. *Baden* (the *Donauversinkung* case) (1927) (Entscheidungen des Reichsgerichts in Zivilsachen (Berlin, de Gruyter), vol. 116 (1927), p. 1; *Annual Digest of Public International Law Cases, 1927–1928* (London, 1931), p. 128).

[86] *Ibid.*, p. 131.

[87] See, *inter alia*, *Kansas* v. *Colorado* (1902) (*United States Reports*, 1910, vol. 185, p. 125) and *Kansas* v. *Colorado* (1907) (*ibid.*, 1921, vol. 206, p. 46); *State of North Dakota* v. *State of Minnesota* (1923) (*ibid.*, 1924, vol. 263, p. 365); *Connecticut* v. *Massachusetts* (1931) (*ibid.*, 1931, vol. 282, p. 660).

[88] *Kansas* v. *Colorado* (1907) (*ibid.*, 1921, vol. 206, p. 100).

[89] *Washington* v. *Oregon* (1936) (*ibid.*, 1936, vol. 297, p. 517). See also *Nebraska* v. *Wyoming et al.* (1945) (*ibid.*, 1946, vol. 325, p. 589), involving a conflict between "established" uses and planned uses of greater benefit.

other States to avail themselves of the flow of water for their own national needs.[90]

47. In the case of *New Jersey* v. *New York*, the United States Supreme Court expressed the same principle as follows:

. . . New York has the physical power to cut off the water within its jurisdiction. But clearly the exercise of such power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether in order that the river might come down to it undiminished. Both States have real and substantial interests in the river that must be reconciled as best they may be.[91]

In short, disputes over the right to use waters flowing across sovereign lines must be adjusted on the basis of "equality of rights". But such equality does not necessarily mean equal division.[92] As stated in the report of the Indus (Rau) Commission, also involving a controversy between federal provinces, in this case in India (Sind and Punjab):

If there is no . . . agreement, the rights of the several Provinces and states must be determined by applying the rule of 'equitable apportionment', each unit getting a fair share of the common river . . .[93]

48. In the *Lake Lanoux* arbitration between France and Spain, decided in 1957, the Tribunal was of the opinion:

that the upper riparian State, under the rules of good faith, has an obligation to take into consideration the various interests concerned, to seek to give them every satisfaction compatible with the pursuit of its own interests and to show that it has, in this matter, a real desire to reconcile the interests of the other riparian with its own.[94]

At the subsequent point in the opinion the Tribunal declared:

France may use its rights; it may not disregard Spanish interests. Spain may demand respect for its rights and consideration of its interests.[95]

2. International agreements and positions of States

49. States have espoused the principle of equality of right in a number of treaties and pronouncements, although in earlier and simpler times the tendency was to "divide" the quantity of water.

50. The growth of diverse uses and the more recent adoption of a "management" approach to increasingly critical shared water resources gradually led system States—particularly where more than two States were concerned—to the more flexible and apt employment of the concept of equitable shares in the *uses* of waters, thus leaving behind the vexatious and unproductive concern over "ownership" of the perpetually transient waters.

51. Examples of recognition of the principle, often reflected as a half-and-half sharing, can be found in numerous bilateral agreements and pronouncements. Austria, in discussions with Bavaria, agreed to this position:

It is recognized that neither State enjoys exclusive rights over the total volume of the waters of contiguous waterways, but that, by virtue of general principles of law, each of them . . . may claim the right to exploit half the volume of the waters of the waterways in question.[96]

52. On behalf of the Sudan, the United Kingdom in 1929 assured Egypt that "the natural and historic rights of Egypt in the waters of the Nile" would be respected.[97]

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[90] *Société énergie électrique du littoral méditerranéen* v. *Campagnia imprese elettriche liguri* (1939) (*Annual Digest and Reports of Public International Law Cases, 1938–1940* (London, 1942), p. 121).

[91] *United States Reports*, 1931, vol. 283, pp. 342–343. In the *Trail Smelter* arbitration between Canada and the United States of America, the tribunal said:

"There are . . . as regards both air pollution and water pollution, certain decisions of the Supreme Court of the United States which may legitimately be taken as a guide in this field of international law, for it is reasonable to follow by analogy, in international cases, precedents established by that court in dealing with controversies between States of the Union or with other controversies concerning the quasi-sovereign rights of such States, where no contrary rule prevails in international law and no reason for rejecting such precedents can be adduced from the limitations of sovereignty inherent in the Constitution" (United Nations, *Reports of International Arbitral Awards*, vol. III (Sales No. 1949.V.2), p. 1964).

The text of the decision is reproduced in part in *Yearbook . . . 1974*, vol. II (Part Two), pp. 193–194, document A/5409, paras. 1053–1054. In that connection, see generally H. Lauterpacht, "Decisions of municipal courts as a source of international law", *The British Year Book of International Law, 1929* (London), vol 10, p. 65.

[92] This rule, enunciated in 1907 in the *Kansas* v. *Colorado* case (*United States Reports*, 1921, vol. 206, p. 100), has been followed in all like United States cases. See *State of Wyoming* v. *State of Colorado et al.* (1922) (*ibid.*, 1923, vol. 259, p. 419); *Connecticut* v. *Massachusetts* (1931) (*ibid.*, 1931, vol. 282, p. 660); *New Jersey* v. *New York* (1931) (*ibid.*, 1931, vol. 283, p. 336); *Hinderlider, State Engineer et al.* v. *La Plata River and Cherry Creek Ditch Co.* (1938) (*ibid.*, 1938, vol. 304, p. 92); *Nebraska* v. *Wyoming et al.* (1945) (*ibid.*, 1946, vol. 325, p. 589).

". . . such disputes are to be settled on the basis of equality of right. But this is not to say that there must be an equal division of the waters of an interstate stream among the States through which it ows. It means that the principles of right and equity shall be applied having regard to the 'equal level or plane on which all States stand'" (*Connecticut* v. *Massachusetts* (1931) (*ibid.*, 1931, vol. 282, p. 670).

Such a 50–50 division is feasible where only two system States are involved and agreement has been concluded to that effect; practical considerations render such simple solutions unrealistic in most cases.

[93] *Report of the Indus Commission and Printed Proceedings* (Simla, 1941; reprinted in Lahore, 1950), pp. 10–11; quoted in M. M. Whiteman, *Digest of International Law* (Washington, D.C., U.S. Government Printing Office, 1964), vol. 3, p. 943.

[94] *Yearbook . . . 1974*, vol. II (Part Two), p. 198, document A/5409, para. 1068. For the full text of the award, see United Nations, *Reports of International Arbitral Awards*, vol. XII (Sales No. 63.V.3), p. 285 (in French). The Tribunal was interpreting the Additional Act to the Treaty of Bayonne of 1866, observing that "when there is a matter for interpretation this should be done according to international law; . . . it is therefore permissible to take into consideration the spirit which governed the Pyrenees treaties and the generally accepted rules of international law" (see *Yearbook . . . 1974*, vol. II (Part Two), p. 195, document A/5409, para. 1063).

[95] *Yearbook . . . 1974*, vol. II (Part Two), p. 198, document A/5409, para. 1068. See also J. G. Laylin and R. L. Bianchi, "The role of adjudication in international river disputes: the Lake Lanoux case", *The American Journal of International Law* (Washington, D.C.), vol. 53, 1959, pp. 30–49; A. Gervais, "L'affaire du lac Lanoux", *Annuaire français de droit international, 1960* (Paris), vol. VI, pp. 372–434. The record of relevant decisions by tribunals, international and quasi-international, is sparse, but see the summaries contained in: Whiteman, *op. cit.*, pp. 1050–1073; W. L. Griffin, "The use of waters of international drainage basins under customary international law", *The American Journal of International Law*, vol. 53, 1959, pp. 59–69; and the 1963 report of the Secretary-General on legal problems relating to the utilization and use of international rivers (*Yearbook . . . 1974*, vol. II (Part Two), pp. 187–199, document A/5409, part three).

[96] Austrian statement of principles regarding successive rivers, in "Legal aspects of hydro-electric development of rivers and lakes of common interest" (E/ECE/136-E/ECE/EP/98/Rev.1 (1952), p. 49). At that time, however, Austria maintained that the waters of successive watercourses were at the complete disposition of the State within which the water was flowing (*ibid.*, p. 51).

[97] Exchange of notes between the United Kingdom and Egypt in

53. Despite earlier identification of the United States of America with the "absolute sovereignty" or Harmon doctrine, the United States Secretary of State, in connection with the ratification in 1945 of the 1944 Mexico–United States Rio Grande Treaty, stated that the two countries would now be able to "co-operate as good neighbours in developing the vital water resources of the rivers in which each has an equitable interest".[98]

54. In connection with differences with Canada over the interpretation of the 1909 Treaty between Canada and the United States of America,[99] the United States, terming the "absolute sovereignty"or Harmon opinion approach as "special pleading"[100] and contrary to customary international law, took the position that:

1. A riparian has the sovereign right to make maximum use of the part of a system of international waters within its jurisdiction, consistent with the corresponding right of each coriparian.

. . .

2. (*a*) Riparians are entitled to share in the use and benefits of a system of international waters on a just and reasonable basis.[101]

55. The Canadian position in the negotiation of the 1909 Treaty with the United States reportedly favoured an international judicial tribunal to decide all cases, existing and future, in accordance with principles to be set forth in the said treaty:

These principles, apparently believed in general to be existing law, were:

1. Navigation was not to be impaired by other uses.

2. Neither country could make diversions or obstructions which might cause injury in the other without the latter's consent.

3. Each country would be entitled to the use of half the waters along the boundary for the generation of power.

4. Each country would be entitled to an "equitable" share of water for irrigation.[102]

56. The position of the United States on such matters generally has been expressed as follows:

The view that a State has under existing international law the sovereign legal right (as distinguished from physical power) to use as it chooses the parts of a system of international waters while within its territory, is tantamount to a view that there is no international law except treaty law—that a State is subject only to such obligations as it has expressly agreed to. Under this view a State would have no legal obligations to its coriparians with regard to a system of international

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regard to the use of the waters of the River Nile for irrigation purposes (League of Nations, *Treaty Series*, vol. XCIII, p. 92).

[98] United States of America, *The Department of State Bulletin*, vol. XII, No. 304, April 1945, p. 742. See also United States of America, Memorandum of the Department of State of 21 April 1958, "Legal aspects of the use of systems of international waters with reference to the Columbia–Kootenay River system under customary international law and the Treaty of 1909" (85th Congress, 2nd Session, Senate document No. 118, pp. 88–91), quoted in part by Whiteman *op. cit.*, pp. 939–942.

For the history of the tentative use and then the discrediting of the "Harmon doctrine", see Lipper, *loc cit.*, pp. 20–40, and documents and works there cited, and K. Krakau, *Die Harmon Doktrin—eine These der Vereinigten Staaten zum internationalen Flussrecht* (Hamburg, Institut für Auswärtige Politik, 1966), especially pp. 29 *et seq.*, 36 *et seq.* and 86 *et seq.* The question is dealt with in G. H. Hackworth, *Digest of International Law* (Washington, D.C., U.S. Government Printing Office, 1940), vol. 1, but with no reference to the opinion formulated by Attorney General Harmon in 1895 on whether certain diversions of the Rio Grande River within United States territory were in violation of Mexican rights according to the "principles of international law, independent of any treaty or convention" (*Official Opinions of the Attorneys General of the United States* (Washington, D.C., U.S. Government Printing Office, 1898), vol. XXI, pp. 280–283). Harmon's opinion was roundly criticized by international water law specialists. See, *inter alia*, the landmark work by H. A. Smith, *The Economic Uses of International Rivers* (London, King, 1931), pp. 40–43. In vol. 3 of the *Digest of International Law* prepared by M. M. Whiteman, the only reference to Harmon is in an excerpt from a "Memorandum of the Legal Adviser of the Department" [of State], Hackworth, of 26 May 1942, in which he reviews existing international agreements with respect to "the use of rivers and lakes having an international aspect" and where he concludes his review

> "to be sufficient to indicate the trend of thought concerning the adjustment of questions relating to the equitable distribution of the beneficial uses of such waters. No one of these agreements adopts the early theory advanced by Attorney General Harmon . . . On the contrary, the rights of the subjacent State are specifically recognized and protected by these agreements"

(Whiteman, *op cit.*, p. 950). Indeed, there is no evidence that the Department of State adopted Harmon's view or applied it in practice, except for the formal caveat in art. V of the 1906 Convention between Mexico and the United States of America, which stipulates that the United States does not "in any way concede the establishment of any general principle or precedent by the concluding of this treaty" (Organization of American States, *Ríos y lagos internacionales (utilización para fines agrícolas e industriales)*, 4th ed., rev. (Washington, D.C., 1971), p. 397), although the purpose of the convention as stated by the United States was to provide for the equitable distribution of the waters of the Rio Grande for irrigation purposes (Hackworth, *op cit.*, p. 584). For the prompt retreat of the United States Attorneys General from the position taken by Harmon, see D. R. Deener, *The United States Attorneys General and International Law* (The Hague, Nijhoff, 1957), especially pp. 253–257 and 308–309. The former United States–Canada International Waterways Commission, however, had in 1906 taken the position "that the exercise of sovereign power over waters within the jurisdiction of a country cannot be questioned" (*Compiled Reports of the International Waterways Commission, 1905–1913*, Sessional Paper No. 19a, Canada, vol. 47, 1913, p. 363). But see the statement made on 24 January 1945 by F. B. Clayton, Counsel for the United States Section, International Boundary and Water Commission, United States and Mexico: ". . . Attorney General Harmon's opinion has never been followed" (United States of America, *Hearings before the Senate Committee on Foreign Relations*, 79th Congress, 1st session, part 1, pp. 97–98).

[99] Treaty between the United States and Great Britain—Boundary Waters between the United States and Canada (United States of America, *Treaty Series*, No. 548 (Washington, D.C., 1924).

[100] Quoting G. Schwarzenberger, *International Law*, 2nd ed. (London, Stevens, 1949), vol. 1, p. 13.

[101] United States of America, Memorandum of the Department of State, "Legal aspects of the use of systems of international waters . . ." (*op cit.*), pp. 9, 59–62, 89–90). The provision of the Treaty in question was art. II, under which each party reserved to itself "exclusive jurisdiction and control over the use and diversion, whether temporary or permanent, of all waters on its own side of the line which in their natural channels would flow across the boundary or into boundary waters". In the dispute over Great Lakes diversions, however, Canada itself had spurned the absolute sovereignty approach. See United States of America, Department of State, *Papers relating to the Foreign Relations of the United States, 1926* (Washington, D.C., 1941), vol. I, p. 580; Hackworth, *op cit.*, p. 621; C. B. Bourne, "The Columbia River controversy", *The Canadian Bar Review* (Ottawa), vol. XXXVII, No. 2, May 1959, p. 444. For other rejections of the Harmon doctrine, see e.g. E. Jiménez de Aréchaga, "International legal rules governing use of waters from international watercourses", *Inter-American Law Review* (New Orleans, La.), vol. II, No. 2, 1960, p. 328, and I. Seidl-Hohenveldern, "Austrian views on international rivers", *Schriftenreihe Annales Universitatis Saraviensis, Rechts und Wirtschaftswissenschaftliche Abteilung* (Cologne, Heymann, 1962), p. 191.

[102] As summarized in United States of America, Memorandum of the Department of State, "Legal aspects of the use of systems of international waters . . ." (*op cit.*), p. 58. The United States position at that time was, with regard to boundary water, "that while each country had interests which must be respected by the other, navigational uses were not necessarily superior to other uses, and equal division of the waters would not necessarily be equitable in all situations" (*ibid.*). "There is no evidence in the record that the United States negotiators intended the general reservation of jurisdiction and control to incorporate the Harmon opinion in the treaty . . . the truism that a State is sovereign in its territory does not lead to the conclusion that a State may legally make unlimited use of waters within its territory" (*ibid.*, pp. 60–61).

waters, or any other matter, until it had become a party to treaties with them. That this view is false is demonstrated by the fact of international relations that sovereignty is restricted by principles accepted as customary international law, in accordance with which the International Court of Justice, or other international tribunal, would pronounce judgement.

. . .

It is accepted legal doctrine that the existence of customary rules of international law, i.e. of practices accepted as law, may be inferred from similar provisions in a number of treaties [citations omitted].

Well over 100 treaties which have governed or today govern systems of international waters have been entered into all over the world. These treaties indicate that there are principles limiting the power of States to use systems of international waters without regard to injurious effects on neighboring States. These treaties restrict the freedom of action of at least one, and usually of both or all, of the signatories with regard to waters within their respective jurisdictions. The number of States parties to these treaties, their spread over both time and geography, and the fact that in these treaties similar problems are resolved in similar ways, make of these treaties persuasive evidence of law-creating international customs . . .[103]

57. Apart from the significant treaties just cited between Mexico and the United States and Canada and the United States, long lists have been compiled of provisions in international agreements that restrict water use or flow.[104] Illustrations of express recognition of the principles of equality of right and of equitable utilization by such agreements follow.

58. One of the oldest treaties that comprehends the equitable and reasonable use rule was that signed at Bayonne between Spain and France in 1866.[105] Portugal and Spain, in "Regulations concerning the conterminous rivers between the two nations", expressly determined in 1866 that their Frontier Treaty of 1864[106] had "provided that the waters ... shall be used in common by the people of both kingdoms ...", and therefore, "in order to prevent the artificial diversion of the course of the rivers, as well as to make the common use thereof practicable", found it "expedient to set forth and apply the recognized principles of international law in the matter".[107] Haiti and the Dominican Republic, in their Treaty of peace, friendship and arbitration of 1929, incorporated these provisions:

In view of the fact that rivers and other streams rise in the territory of one of the two States and flow through the territory of the other or serve as boundaries between them, the two High Contracting Parties undertake not to carry out or be a party to any constructional work calculated to change their natural course or to affect the water derived from their sources.

This provision shall not be so interpreted as to deprive either of the two States of the right to make just and equitable use, within the limits of their respective territories, of the said rivers and streams for the irrigation of the land or for other agricultural and industrial purposes.[108]

Austria and Bavaria, resolving a dispute over the waters tributary to the Schinsee after the First World War, came to this agreement, which recognizes that division simply by volume might not be the optimum solution:

(*a*) It is recognized that neither State enjoys exclusive rights over the total volume of the waters of contiguous waterways, but that, by virtue of general principles of law, each of them—apart from exceptions arising from special legal circumstances—may claim the right to exploit half the volume of the waters of the waterway in question;

(*b*) To ensure that the hydro-electric development of a particular waterway takes place under the most favourable economic conditions, it would be desirable, in each individual case, to seek by common agreement what manner of developing the hydro-electric resources of the waterway is calculated to give the highest yield from both the technical and economic standpoints;

(*c*) Should the study point to the conclusion that the most rational solution is not the sharing of the volume of the waters but some other form of exploitation such as a division based on the gradient of the river bed, the right to the harnessing, in one or the other State, of the hydro-power in question and to the use of the volume of water belonging to the other State will be conceded on condition that the economic interests of the renouncing State and the possible rights of private individuals concerned be safeguarded. That being so the latter State would not refuse to the other State, or to a national of the other State seeking the concession, the right of harnessing the volume of water to which it or he is entitled.[109]

59. Following an extensive review of State practice, the authors of one study were able, over 20 years ago, to find the following:

While practice indicates that a State may unilaterally develop a section of an international river that is within its territory, it seems safe to conclude that the nature and extent of such unilateral development is limited by the equitable doctrine that one [may] not use his property in a manner to interfere inequitably with the use by another of his property. This conclusion is supported by both the domestic jurisprudence of a large number of States and international

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[103] *Ibid.*, p. 63, followed by an analysis of selected relevant treaties. A prior memorandum from the Office of the Legal Adviser of the United States Department of State had concluded, with respect to the use of water as between upper and lower riparian States: ". . . common interests are recognized and . . . adjustments are made by agreement on the basis of comity and equity" ("Riparian rights as between countries", memorandum of 17 August 1944 by the Legal Adviser, G. H. Hackworth, quoted in Whiteman, *op cit.*, pp. 942–943). In 1924, the United States Congress acted to authorize co-operation with Mexico in a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman; eventually negotiations, widened to include the Colorado, resulted in the 1944 treaty between the two countries. Accepting Mexico's suggestion in 1943 to refer technical aspects of the negotiations to the International Boundary and Water Commission, the United States advised that it "concurs fully with the concepts of the Government of Mexico to the effect that the problems to be solved looking to the desired just division of the waters of these two international streams comprehend primarily a mutual determination of sound and practical assumptions to provide the basis of a formula on equitable apportionment" (*ibid.*, pp. 945 and 958). On equitable utilization aspects, see also C. Meyers, "The Colorado Basin", *The Law of International Drainage Basins* (*op cit.*), pp. 538–540 and 571, and documents and works there cited.

[104] See Smith, *op cit.* (51 treaties from 1785 to 1930); "Legal aspects of hydro-electric development ..." (E/ECE/136–E/ECE/EP/98/Rev. 1, annex 1) (some 40 additional treaties); A. M. Hirsch, "Utilization of international rivers in the Middle East—a study of conventional international law", *The American Journal of International Law*, vol. 50, 1956, pp. 81–100; F. Berber, *Die Rechtsquellen des Internationalen Wassernutzungsrechts* (Munich, Oldenberg, 1955)—English trans.: *Rivers in International Law* (London, Stevens, 1959).

[105] *British and Foreign State Papers, 1865–1866* (London, 1870), vol. 56, p. 226. See also the award in the *Lake Lanoux* arbitration, cited in para. 48 above.

[106] See especially art. 28 of the Treaty (*British and Foreign State Papers, 1871–1872* (London, 1877), vol. LXVII, p. 941). See also United Nations, *Legislative Texts and Treaty Provisions concerning the Utilization of International Rivers for other Purposes than Navigation* (Sales No. 63.V.4), p. 893.

[107] *British and Foreign State Papers, 1871–1872* (*op. cit.*), p. 952. By an exchange of notes, the two countries in 1912 agreed that "the two nations shall have the same rights in the border sections of the rivers, each accordingly being entitled to half the flow of water existing at the various seasons of the year" (United Nations, *Legislative Texts . . .*, p. 909).

[108] Art. X (League of Nations, *Treaty Series*, vol. CV, p. 225).

[109] As recorded in "Legal aspects of hydro-electric development . . ." (E/ECE/136–E/ECE/EP/98/Rev. 1, pp. 49–50).

agreements. Frequently, when a State contemplates a use which is expected to cause serious and lasting injury to the interests of another State in the river, development has not been undertaken until there has been agreement between the States. Such agreements do not follow any particular pattern but resolve immediate problems on an equitable basis . . .[110]

60. The United Kingdom Foreign Secretary instructed his representative in the negotiations with Egypt, which yielded the 1929 agreement concerning the Nile, to this effect:

The principle is accepted that the waters of the Nile, that is to say, the combined flow of the White and Blue Niles and their tributaries, must be considered as a single unit, designed for the use of the peoples inhabiting their banks according to their needs and their capacity to benefit therefrom; and, in conformity with this principle, it is recognized that Egypt has a prior right to the maintenance of her present supplies of water for the areas now under cultivation, and to an equitable proportion of any additional supplies which engineering works may render available in the future.[111]

The Governments of Egypt and Sudan, after discussing established rights with respect to Nile waters, agreed that any additional supplies must be apportioned equitably; however, agreement on the specifics of equitable division was not attained at that time.[112] In their 1959 Nile Waters Agreement, the rights of each party to certain quantities of water were confirmed in the context of a much wider agreement. Article 3, paragraph 2, of the Agreement provides:

. . . when the Republic of Sudan is ready to utilize its share according to the agreed programme, it shall pay to the United Arab Republic a share of all the expenses in the same ratio as the Sudan's share in benefit is to the total benefit of the project; provided that the share of either Republic shall not exceed one half of the total benefit of the project.[113]

And article 5, paragraph 2, stipulates:

As the riparian States, other than the two Republics, claim a share in the Nile waters, the two Republics have agreed that they shall jointly consider and reach one unified view regarding the said claims. And if the said consideration results in the acceptance of allotting an amount of the Nile water to one or the other of the said States, the accepted amount shall be deducted from the shares of the two Republics in equal parts, as calculated at Aswan.[114]

61. In the treaty of 1933 between Brazil and Uruguay on the legal status of their frontier, it was provided that "each of the two States shall be entitled to dispose of half the water flowing in the frontier watercourses".[115] Haiti and the Dominican Republic, in their Treaty of peace, friendship and arbitration of 1929, agreed as follows:

In view of the fact that rivers and other streams rise in the territory of one of the two States and flow through the territory of the other or serve as boundaries between them, the two High Contracting Parties undertake not to carry out or be a party to any constructional work calculated to change their natural course or to affect the water derived from their sources.

This provision shall not be so interpreted as to deprive either of the two States of the right to make just and equitable use, within the limits of their respective territories, of the said rivers and streams for the irrigation of the land or for other agricultural and industrial purposes.[116]

62. The 1921 Treaty of friendship between Persia and the Russian Socialist Federal Soviet Republic provided that the two States "shall have equal rights of usage over the Atrak River and the other frontier rivers and waterways".[117] In its final Protocol, the Commission on the delimitation of the Turkish–Syrian border declared in 1930:

As the vicinity of the Tigris imposes specific obligations on the riparians, it becomes necessary to establish rules concerning the rights of each sovereign State in its relations with the other.

All questions, such as navigation, fishing, industrial and agricultural utilization of the waters, and the policing of the river, shall be resolved on the basis of complete equality.[118]

And in the 1946 Treaty of friendship and neighbourly relations between Iraq and Turkey, "the maintenance of a regular water supply and the regulation of the water flow . . . with a view to avoiding . . . floods during the annual periods of high water" was stipulated, and the importance of conservation works was recognized with respect to the Tigris and Euphrates rivers and their tributaries. Turkey agreed, moreover, to inform Iraq of its plans for conservation works on the rivers or their tributaries "in order that these works may as far as possible be adapted, by common agreement, to the interests of both Iraq and Turkey".[119]

63. The principle of division has in some instances been extended to power generated from the waters of an international watercourse. In 1949 Italy and Switzerland agreed, with respect to the construction and operation of a dam in the Reno di Lei, that 30 per cent of the power produced would be for Italy and 70 per cent for Switzerland.[120]

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[110] C. Eagleton, "The law and uses of international rivers", research project conducted under the auspices of the New York University School of Law, 30 June 1959, pp. 4–6 (mim.), reproduced in Whiteman, *op. cit.*, pp. 874–875.

[111] *Egypt No. 1 (1928)—Papers regarding Negotiations for a Treaty of Alliance with Egypt*, Cmd. 3050 (London, H.M. Printing Office, 1928), p. 31.

[112] Sudan, Ministry of Irrigation and Hydro-Electric Power, *The Nile Waters Question* (Khartoum, 1955), p. 13. The exchange of notes of 1929 between the United Kingdom and Egypt concerning the utilization of the Nile waters provided that any increase in the use of Nile waters in Sudan would be such "as does not infringe Egypt's natural and historical rights . . . and its requirements of agricultural extension, subject to satisfactory assurances as to the safeguarding of Egyptian interests as detailed in later paragraphs" (League of Nations, *Treaty Series*, vol. XCIII, p. 44).

[113] United Nations, *Treaty Series*, vol. 453, p. 70.

[114] *Ibid.*, p. 72. For detailed documentation and discussion of the considerations of equity with respect to Nile waters and the positions of the other riparians, see especially S. Hosni, "The Nile regime", *Revue égyptienne de droit international* (Cairo), vol. 17, 1961, p. 70; G. Badr, "The Nile waters question: background and recent development" (*ibid.*, vol. 15, 1959, p. 94); Whiteman, *op. cit.*, pp. 1002–1013; Garretson, "The Nile Basin", *The Law of International Drainage Basins* (*op. cit.*), pp. 270–292, and works there cited.

[115] Article XIX (League of Nations, *Treaty Series*, vol. CLXXXI, p. 85).

[116] Art. 10 (*ibid.*, vol. CV, p. 225).

[117] Art. 3 (*ibid.*, vol. IX, p. 403). The Persia–USSR Agreement of 1926 defined the parties' rights over the 14 streams involved more specifically; for example, seven tenths of the flow of the Tedjen River were apportioned to the USSR and three tenths to Persia, and after Persian needs were met, the USSR had the right to the remaining flow; most rivers were equally divided (United Nations, *Legislative Texts* . . ., p. 371).

[118] France, Ministry for Foreign Affairs, *Rapport à la Societé des Nations sur la situation de la Syrie et du Liban (année 1930)* (Paris, 1931), annex 1, p. 177.

[119] United Nations, *Treaty Series*, vol. 37, pp. 287 and 291. For analyses, additional examples and qualifications for the region, see Hirsch, *loc. cit.*, pp. 84–94 and 98–100. See also the provisions on sharing of the 1953 Agreement between Jordan and Syria concerning the utilization of the waters of the Yarmuk (United Nations, *Treaty Series*, vol. 184, p. 15).

[120] Whiteman, *op. cit.*, p. 1034. See also the 1953 agreement

(*Continued on next page.*)

64. In 1938, Guatemala and El Salvador concluded a boundary treaty which contains this stipulation: "Each Government reserves the right to utilize half the volume of water in frontier rivers, either for agricultural or industrial purposes; . . ."[121] A subsequent draft treaty between the two countries guaranteed Guatemala a stipulated amount of electricity, and indemnification for the flooding of Guatemalan territory, from a power and storage dam project undertaken by El Salvador on the Lempa River to regulate the waters of Lake Güija (shared by the two countries) and to generate electricity.[122] Uruguay and Argentina, in their 1946 Agreement concerning the utilization of the rapids of the Uruguay River in the Salto Grande area and its Additional Protocol, agreed upon use of the river's waters in common, in equal parts; electricity from the dam at Salto Grande, now completed, was included, although Argentina was allowed to use more than its 50 per cent share initially.[123]

65. One of the prime cases of equitable apportionment or utilization is that of the modern Indus Waters Treaty of 1960 between India and Pakistan, concluded with the participation of the World Bank.[124] The settlement was the culmination of an involved process of negotiation.[125] And Denmark and Germany, in their 1922 Agreement relating to frontier watercourses, expressed the basic principle as follows:

> The proprietors on both banks of any one of the watercourses mentioned in article 1 have equal rights as regards the use of the water, so that if irrigation works are erected upon one bank only half of the water of the watercourses may be assigned to these works. The Frontier Water Commission shall establish detailed regulations for the apportionment of the water in connection with the erection of irrigation works.
>
> If, however, all the proprietors and usufructuaries of the land on the opposite bank . . . give their assent, more than half the water may be applied to irrigation works on one bank.[126]

66. While agreements of recent vintage between and among system States have carried these principles forward, they embody as well the more comprehensive approach of multiple uses, including hydropower, plus concern for certain harmful effects of water, such as floods and obstructions to navigation, even where the agreements were not system-wide or oriented towards joint management. Thus in a 1957 agreement, Norway and the USSR declared that they were "desirous . . . of utilizing the waterpower of the Pasvik (Paatso) river . . . for their mutual benefit on the basis of an equitable apportionment".[127] Austria and the Federal Republic of Germany, together with the Free State of Bavaria, entered into an agreement in 1952 for the purpose of promoting the "joint development and utilization of water power on the frontier section of the Danube".[128]

67. As recently as 1973, Paraguay and Brazil concluded a treaty concerning the hydroelectric utilization of the water resources of the Paraná River, resulting specifically in the immense Itaipú project, which shares power in traditional terms:

> The energy produced by the hydroelectric utilization scheme referred to in article I shall be divided into equal parts between the two countries and each one shall have the right to acquire . . . the energy not utilized by the other country for its own consumption.[129]

In article I, the two countries agreed "to utilize for hydroelectric purposes, jointly and in accordance with the provisions of this Treaty and annexes thereto, the water resources of the Paraná River owned in condominium by the two countries".[130]

68. Yugoslavia and its neighbours, on the other hand, have taken a comprehensive systems and water economy approach. The Agreement with Albania of 1956 is illustrative:

> 1. The contracting parties undertake, pursuant to the provisions of this Agreement, to examine and to resolve by agreement all questions of water economy, including measures and works which may affect the quantity and quality of the water and which are of interest to both or either of the contracting parties, having due regard to the maintenance of a common policy in water economy relations and recognizing the rights and obligations arising out of such policy.
>
> 2. The provisions of this Agreement shall apply to all water economy questions, measures and works on watercourses which form the State frontier and watercourses, lakes and water systems which are intersected by the State frontier (especially Lake Ohrid, the Crni Drim, the Beli Drim, Lake Skadar and the Bojana), and which are of interest to both contracting parties, and in particular to:
>
> (*a*) The utilization of water power;
>
> (*b*) The regulation and canalization of watercourses and lakes and the maintenance of their beds;
>
> (*c*) The discharge of water, drainage and similar measures;
>
> (*d*) Protection against flooding;
>
> (*e*) Storage and retention works;
>
> (*f*) Water supply and pipe-laying;
>
> (*g*) Navigation;
>
> (*h*) Ground water;
>
> (*i*) Protection against soil erosion;
>
> (*j*) The utilization of water in agriculture;
>
> (*k*) Hydrological studies, the preparation of projects and the execution of works;
>
> (*l*) Fishing;
>
> (*m*) The apportionment of the cost of survey, planning and consruction works, and of operation and maintenance;
>
> (*n*) The exchange of data and plans and of information on the above questions; and
>
> (*o*) The exchange of data on water levels.
>
> 3. The expression "water system" shall mean, in this Agreement, all watercourses (surfaces or underground, natural or artificial), installations, measures and works which may affect watercourses from the standpoint of water economy, and installations forming or intersected by the State frontier.
>
> 4. The expression "water economy" shall mean, in this Agreement, everything covered by the sense of the French expression "régime des eaux".

(Footnote 120 continued.)

(exchange of notes) between Portugal and the United Kingdom on, *inter alia*, the Shiré Valley project survey (hydro-electric power and irrigation) (United Nations, *Treaty Series*, vol. 175, p. 14).

[121] League of Nations, *Treaty Series*, vol. CLXXXIX, p. 295.

[122] Signed 15 April 1957. See Whiteman, *op. cit.*, p. 1036.

[123] United Nations, *Treaty Series*, vol. 671, p. 26. The 1913 Convention between France and Switzerland on the management of the hydraulic power of the Rhone River stipulated in art. 5 that each party was entitled to a share of the power in proportion to the "fall of the river at right angles to the portions of the banks belonging to it" (United Nations, *Legislative Texts . . .*, p. 709).

[124] United Nations, *Treaty Series*, vol. 419, p. 125.

[125] For the explication and analysis, see R. Baxter, "The Indus Basin", *The Law of International Drainage Basins* (*op. cit.*), pp. 443–485, and documents and works there cited.

[126] Art. 35 (League of Nations, *Treaty Series*, vol. X, p. 221).

[127] United Nations, *Treaty Series*, vol. 312, p. 274.

[128] United Nations, *Legislative Texts . . .*, p. 476.

[129] Art. XIII (United Nations, *Treaty Series*, vol. 923, p. 95).

[130] *Ibid.*, pp. 92–93.

5. The question of fishing shall be regulated by a separate Protocol which shall constitute annex II to this Agreement.[131]

The earlier Frontier Treaty between the Soviet Union and Romania, concluded in 1949, is less systematic but essentially of the same genre.[132]

69. Many modern treaties apparently take the principle of shared rights or common use as a presumed point of departure and proceed, without articulating any general rule, to spell out the specifics of their sharing of responsibilities, of the arrangements for various kinds of improvement and maintenance works, of co-ordination of activities (including information and data collection and exchange) and settlement of differences, usually through the creation of a joint commission or similar institution; the notion of equal division of water by volume is now ordinarily absent. The Agreement between Czechoslovakia and Hungary of 1954 concerning the settlement of technical and economic questions relating to frontier watercourses is a prime example.[133]

70. There also exists a series of quite recent agreements among developing countries in which the system States have felt it not only unnecessary to iterate their respective rights or shares, but have instead taken practical steps to bring about integrated management of their international watercourse systems. The Agreement for the establishment of the Organization for the Management and Development of the Kagera River Basin, entered into in 1977 by Burundi, Rwanda and the United Republic of Tanzania, is the most recent and far-reaching example.[134] Similarly comprehensive approaches, designed to achieve not just "equitable" but optimum utilization by fully international, system-wide organizations have been taken by some of or all the system States of several other international watercourses.[135] These include the Senegal Basin,[136] the Niger Basin,[137] the Gambia Basin,[138] and the Lake Chad Basin.[139] In such arrangements for the integrated development, use and protection of shared water resources, the residual duty to utilize waters equitably has been taken for granted and surpassed by recognition of the need to achieve the optimum use of waters rationally, by installing machinery for system-wide planning and implementation of the system States' projects and programmes as co-ordinated or joint ventures.

71. The Treaty for Amazonian co-operation indicates the parties'

> . . . common aim of pooling the efforts being made, both within their respective territories as well as among themselves, to promote the harmonious development of the Amazon region, to permit an equitable distribution of the benefits of said development among the contracting parties so as to raise the standard of living of their people . . .[140]

Article I of the Treaty commits the parties "to undertake joint actions and efforts to promote the harmonious development of their respective Amazonian territories in such a way that these joint actions produce equitable and mutually beneficial results and achieve also the preservation of the environment, and the conservation and rational utilization of the natural resources of those territories".[141] The approach of regarding the rights of a system State as essentially "against" those of others, the defensive attitude of rivals[142] or contenders—each guarding his own—has been replaced by affirmative participation in some of or all the activities affecting available water resources, including flood control, river regulation, disease prevention, anti-pollution measures, drought mitigation and land use planning, as well as water uses; the costs of these joint undertakings are shared equitably.[143]

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[131] Art. 1 (United Nations, *Legislative Texts . . .*, pp. 441–442). See also the 1954 Agreement between Yugoslavia and Austria and annexed Statute (United Nations, *Treaty Series*, vol. 396, pp. 100 and 108); the 1958 Agreement between Yugoslavia and Bulgaria and annexed Statute (*ibid.*, vol. 367, pp. 104 and 114); and the 1955 Agreement between Yugoslavia and Romania and annexed Statute (United Nations, *Legislative Texts . . .*, pp. 928 and 931).

[132] *Ibid.*, p. 919.

[133] United Nations, *Treaty Series*, vol. 504, p. 254. See also, *inter alia*, the 1959 Agreement between Greece and Yugoslavia (*ibid.*, vol. 363, p. 135); the 1970 Agreement between Greece and Yugoslavia (see *Yearbook . . . 1974*, vol. II (Part Two), p. 319, document A/CN.4/274, para. 305); the agreements of 1954 (Kosi project) and 1959 (Gandak project) between Nepal and India (United Nations, *Legislative Texts . . .*, pp. 290 and 295); and the 1946 Protocol between Iraq and Turkey (United Nations, *Treaty Series*, vol. 37, p. 287).

[134] The parties commit themselves to develop in the basin not only the uses of their shared water resources, but also "agriculture, mining industries and tourism" in general. The Agreement focuses on the powers, functions and structuring of their international organization for these purposes; it is open for accession by Uganda, the fourth system State. In the 1969 Treaty of Brasilia, Argentina, Bolivia, Brazil, Paraguay and Uruguay agreed to combine their efforts for the purpose of promoting the harmonious development and physical integration of the River Plate Basin (United Nations, *Treaty Series*, vol. 875, p. 11); see also *Yearbook . . . 1974*, vol. II (Part Two), pp. 291–292, document A/CN.4/274, para. 61.

[135] See the language of "sharing" and "of making the optimum utilization of the water resources of their region by joint efforts" in the preamble to the 1977 Bangladesh–India Agreement on sharing of the Ganges' waters (*International Legal Materials* (Washington, D.C., vol. XVII, No. 1, Jan. 1978), p. 103).

[136] The Organization for the Development of the Senegal River, including a General Secretariat, was created by the Nouakchott Convention of 11 March 1972 between Mali, Mauritania and Senegal; on the same date, a separate Convention was adopted on the Statute of the Senegal River (TD/B/609/Add.1, vol. IV). In 1975, the organization was restructured and an Office of the High Commissioner created. These developments had been preceded in 1968 by a Statute of the Organization of the Senegal Riparian States (United Nations, *Treaty Series*, vol. 672, p. 251), on the basis of a 1963 Convention (see *Yearbook . . . 1974*, vol. II (Part Two), p. 289, document A/CN.4/274, paras. 36–39) and of a 1964 Convention (*ibid.*, pp. 289–290, paras. 45–50).

[137] See the 1963 Act of Niamey regarding navigation and economic co-operation between the States of the Niger Basin (United Nations, *Treaty Series*, vol. 587, p. 11), concluded by all nine system States, and the 1964 Agreement concerning the Niger River Commission and navigation and transport on the River Niger (*ibid.*, p. 21).

[138] See *inter alia* the 1965 Convention between Gambia and Senegal for the integrated development of the Gambia River Basin (*Cahiers de l'Afrique équatoriale* (Paris), 6 March 1965); the 1968 Agreement on the integrated development of the Gambia River Basin (Senegalo–Gambian Permanent Secretariat, *Senegalo–Gambian Agreements, 1965–1976* (Banjul), No. 3); the 1976 Convention on the establishment of the Co-ordinating Committee for the Gambia River Basin project (*ibid.*, No. 23).

[139] See the 1964 Convention and Statute relating to the development of the Chad Basin (*Journal officiel de la République fédérale du Cameroun* (Yaoundé), 4th year, No. 18, 15 Sept. 1964, p. 1003).

[140] From the preamble. The text of the Treaty was distributed to the General Assembly as document A/35/580 (to be issued as No. 19194 in the United Nations *Treaty Series*). The signatories are Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela.

[141] *Ibid.*, To this end, they are to "exchange information and prepare operational agreements and understandings" (*ibid.*). See also the 1971 Agreement between Finland and Sweden on frontier waters (United Nations, *Treaty Series*, vol. 825, p. 272).

[142] The word "rival" derives from the Latin *rivalis*, i.e. one living on the opposite bank of a stream from another.

[143] See e.g. the 1961 Treaty between Canada and the United States

(*Continued on next page.*)

72. The more traditional approach, however, is still employed in some recent agreements. For example, the preamble of the 1971 Convention between Ecuador and Peru invokes the doctrine of reasonable and equitable utilization and the principles of the 1933 Declaration of Montevideo.[144] A Mixed Commission was created and multipurpose utilizations and the exchange of data were also provided for.[145]

3. Current state of doctrine

73. Basing themselves on the practice of States, reviewed illustratively above, virtually all the commentators[146] writing in the field sustain the existence of equitable utilization as a rule of general international law where the system States have conflicting uses or plans for the further development of their shared water resources.[147]

74. One of the earliest and most influential studies was by H. A. Smith, in 1931, based on a comprehensive survey of treaties. He distilled the following legal principles:

(1) . . . every river system is naturally an indivisible unit, and that as such it should be so developed as to render the greatest possible service to the whole human community which it serves, whether or not that community is divided into two or more political jurisdictions. It is the positive duty of every Government concerned to co-operate to the extent of its power in promoting this development, though it cannot be called upon to imperil any vital interest or to sacrifice without full compensation and provision for security any other particular interest of its own, whether political, strategic or economic, which the law of nations recognizes as legitimate . . ..

The following inferences may reasonably be drawn:

(2) No State is justified in taking unilateral action to use the waters of an international river in any manner which causes or threatens appreciable injury to lawful interests of any other riparian State.

(3) No State is justified in opposing the unilateral action of another in utilizing waters, if such action neither causes nor threatens any appreciable injury to the former State.

(4) Where any proposed employment of waters promises great benefits to one State and only minor detriment to another, it is the duty of the latter State to acquiesce in the employment proposed, subject to full compensation and adequate provision for future security.

(5) Where any proposed employment of waters by one State threatens to injure the legitimate and vital interests of another, the latter is justified in offering an absolute opposition to the employment proposed but any difference as to the existence or non-existence of such a vital interest should be regarded as a justifiable dispute . . .

(6) Where the differences between States relate to technical matters, their solution, failing direct agreement, should be referred to international commissions possessing the appropriate technical qualifications.

. . .

(9) Generally it is the duty of all riparian States to consult fully and freely with one another with regard to all questions that may arise concerning the use of international rivers, whether navigable or not, and to abstain from any unilateral action that may affect the interests of other riparian States without giving these States every opportunity of studying and expressing their opinion upon the questions involved.[148]

75. Sir Humphrey Waldock, with Brierly, found "that some broad principles of international river law have now come into existence, though their precise formulation may still remain to be settled". He stated them as follows:

(1) Where a river system drains the territories of two or more States, each State has the right to have that river system considered as

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(*Footnote 143 continued*)

of America relating to co-operative development of the water resources of the Columbia River Basin and subsequent agreements related thereto (United Nations, *Treaty Series*, vol. 542, p. 244, and vol. 714, p. 298), and Johnson, *loc. cit.*, pp. 167–171, 216–241, and documents and works there cited. See also the 1973 Treaty concerning the Plata River and its maritime outlet between Argentina and Uruguay (see *Yearbook . . . 1974*, vol. II (Part Two), pp. 298–300, document A/CN.4/274, paras. 115–130); and the 1967 Treaty between Austria and Czechoslovakia concerning the regulation of water management questions relating to frontier waters (United Nations, *Treaty Series*, vol. 728, p. 352).

[144] In regard to this set of principles on the agricultural and industrial uses of international rivers, see para. 78 below.

[145] See especially arts. 1–7 of the Convention (Ecuador, *Registro oficial* (Quito), 2nd year, No. 385, 4 January 1972, p. 1).

[146] An exception is Berber, *Rivers in International Law*, *op. cit.*; however, Berber takes a restrictive view of customary international law as his point of departure. See in that connection J. Andrassy, "L'utilisation des eaux des bassins fluviaux internationaux", *Revue égyptienne de droit international* (Cairo), vol. 16, 1960, pp. 30–31; Barberis, "L'élément matériel de la coutume internationale d'après la Cour de La Haye", *Nederlands Tijdschrift voor International Recht* (Leyden), vol. XIV, 1967, p. 367; R. D. Hayton, "The formation of the customary rules of international drainage basin law", *The Law of International Drainage Basins* (*op. cit.*), pp. 834–895, and works there cited.

[147] See e.g. J. Dräger, *Die Wasserentnahme aus internationalen Binnengewässern* (Bonn, Röhrscheid, 1970); Griffin, *loc. cit.*, pp. 50–80; Lipper, *loc. cit.*; Andrassy, *loc. cit.*, pp. 23–40; J. L. Brierly, *The Law of Nations*, 6th ed., rev., H. Waldock, ed. (Oxford, Clarendon Press, 1963), pp. 231–232; F. Villagrán Kramer, "El aprovechamiento de las aguas del lago de Güija", *Revista de la Asociación Guatemalteca de Derecho Internacional*, No. 3, Jan. 1959, pp. 95–121; Barberis, *Los recursos . . .* (*op. cit.*), pp. 35–45, and works and examples there cited; R. B. Bilder, "International law and natural resources policies", *Natural Resources Journal* (Albuquerque, N.M.), vol. 20, 1980, p. 451; E. Hartig, *Internationale Wasserwirtschaft und Internationales Recht* (Vienna, Springer, 1955). See also Asian-African Legal Consultative Committee, *Report of the Twelfth Session* (Colombo, 18–27 Jan. 1971) (New Delhi, 1972), containing the report of the Sub-Committee on the Law of International Rivers, for various proposals on the subject, and *Report of the Eleventh Session* (Accra, 19–29 Jan. 1970) (New Delhi), pp. 191–240, and works and documents there cited, all of which embrace equitable utilization.

[148] Smith, *op. cit.*, p. 150. Treatise writers had earlier stated similar conclusions, drawing chiefly on "the law of international neighbourship rights". See e.g. E. Caratheodory, *Du droit international concernant les grands cours d'eaux* (Leipzig, Brockhaus, 1861), p. 32; L. von Bar, "L'exploitation industrielle des cours d'eaux internationaux au point de vue du droit international", *Revue générale de droit international public* (Paris), vol. XVII, 1910, p. 281; A. Lederle, *Das Recht der internationalen Gewässer unter besonderer Berücksichtigung Europas* (Mannheim, Bensheimer, 1920), pp. 51 *et seq.* and 60 *et seq.*; H. P. Farnham, *The Law of Waters and Water Rights; International, National, State, Municipal and Individual, including Irrigation, Drainage and Municipal Water Supply* (Rochester, N.Y., The Lawyers Co-operative Publishing Co., 1904); G. R. Björksten, *Das Wassergebiet Finnlands in völkerrechtlicher Hinsicht* (Helsinki, Tilgmann, 1925), pp. 8 and 166 *et seq.*; P. Fauchille, *Traité de droit international public*, 8th ed., rev., *Manuel de droit international public* prepared by H. Bonfils (Paris, Rousseau, 1925), vol. I, part 2, pp. 450 *et seq.* Similar conclusions will be found, for example, in C. Sosa-Rodríguez, *Le droit fluvial international et les fleuves de l'Amérique latine* (Paris, Pedone, 1935); A. W. Quint, "Nouvelles tendances dans le droit fluvial international", *Revue de droit international et de législation comparée* (Brussels), 3rd series, vol. XII, 1931, p. 325; E. Kaufmann, "Règles générales du droit de la paix", *Recueil des cours de l'Académie de droit international de La Haye, 1935–IV* (Paris, Sirey, 1936), vol. 54, p. 309; G. Sauser-Hall, "L'utilisation industrielle des fleuves internationaux", *Recueil des cours . . ., 1953–II* (Leyden, Sijthoff, 1955), vol. 83, pp. 555 and 557; P. Fedozzi, *Trattato di diritto internazionale* (Padua, CEDAM, 1933); O. Gönnenwein, *Die Freiheit der Flusschiffahrt* (Stuttgart, Kohlhammer, 1940), p. 65 *et seq.*; "Legal aspects of hydro-electric development . . ." (E/ECE/136-E/ECE/EP/98/Rev. 1).

a whole and to have its own interests taken into account together with those of other States;

(2) each State has in principle an equal right to make the maximum use of the water within its territory, but in exercising this right must respect the corresponding rights of other States;

(3) where one State's exercise of its rights conflicts with the water interests of another, the principle to be applied is that each is entitled to the equitable apportionment of the benefits of the river system in proportion to their needs and in the light of all the circumstances of the particular river system;

(4) a State is in principle precluded from making any change in the river system which would cause substantial damage to another State's right of enjoyment without that other State's consent;

(5) it is relieved from obtaining that consent, however, if it offers the other State a proportionate share of the benefits to be derived from the change or other adequate compensation for the damage to the other State's enjoyment of the water;

(6) a State whose own enjoyment of the water is not substantially damaged by a development in the use of a river beneficial to another State is not entitled to oppose that development.[149]

76. The relevant portions of the "Salzburg resolution" of the Institute of International Law and of the Helsinki Rules of the International Law Association have already been quoted.[150] However, reference to some additional collective conclusions of learned professional bodies is merited. At the Tenth (Buenos Aires) Conference of the Inter-American Bar Association in 1957, a resolution was adopted which reads in part:

I. . . . the following general principles, which form part of existing international law, are applicable to every watercourse or system of rivers or lakes (non-maritime waters) which may traverse or divide the territory of two or more States (such a system being referred to hereinafter as a "system of international waters"):

1. Every State having under its jurisdiction a part of a system of international waters has the right to make use of the waters thereof insofar as such use does not affect adversely the equal right of the States having under their jurisdiction other parts of the system.

2. States having under their jurisdiction a part of a system of international waters are under a duty, in the application of the principle of equality of rights, to recognize the right of the other States having jurisdiction over a part of the system to share the benefits of the system . . .;

3. States having under their jurisdiction part of a system of international waters are under a duty to refrain from making changes in the existing regime that might affect adversely the advantageous use by one or more other States having a part of the system under their jurisdiction except in accordance with: (i) an agreement with the State or States affected or (ii) a decision of an international court or arbitral commission; . . .[151]

77. The following year, the International Law Association adopted its "New York resolution", the most pertinent portions of which are as follows:

Agreed principles of international law

1. A system of rivers and lakes in a drainage basin should be treated as an integrated whole (and not piecemeal).

. . .

2. Except as otherwise provided by treaty or other instruments or customs binding upon the parties, each co-riparian State is entitled to a reasonable and equitable share in the beneficial uses of the waters of the drainage basin. What amounts to a reasonable and equitable share is a question to be determined in the light of all the relevant factors in each particular case.

3. Co-riparian States are under a duty to respect the legal rights of each co-riparian State in the drainage basin.[152]

78. An important precedent for the ILA Committee members was the Declaration adopted by the Seventh International Conference of American States at Montevideo in 1933 on the industrial and agricultural uses of international rivers, which emphasizes affirmative co-operation and reads in part:

1. In case that, in order to exploit the hydraulic power of international waters for industrial or agricultural purposes, it may be necessary to make studies with a view to their utilization, the States on whose territories the studies are to be carried on, if not willing to make them directly, shall facilitate by all means the making of such studies on their territories by the other interested State and for its account.

2. The States have the exclusive right to exploit, for industrial or agricultural purposes, the margin which is under their jurisdiction, of the waters of international rivers. This right, however, is conditioned in its exercise upon the necessity of not injuring the equal right due to the neighbouring State over the margin under its jurisdiction.[153]

79. A number of international organs have in recent years taken clear stands in favour of strengthened co-operation among system States in view of the perceived need for more rational utilization of the world's shared water resources. Thus the Committee on Natural Resources of the United Nations Economic and Social Council received a report from the Secretary-General which emphasized that a shift had taken place from the early period of minimal international co-ordination to a more active approach in light of "the rapid expansion of increasingly complex societies in most parts of the world . . . Multiple, often conflicting uses and much greater total demand have made imperative an integrated approach to river basin development in recognition of the growing economic as well as physical interdependencies across national frontiers".[154] International water resources, defined as water in a natural hydrological system shared by two or more countries, offer a unique kind of opportunity for the promotion of international amity.

The optimum beneficial use of such waters calls for practical measures of international association where all parties can benefit in a tangible and visible way through co-operative action. Water is a vital resource, the benefits from which can be multiplied through joint efforts and the harmful effects of which may be prevented or removed through joint efforts. . . . A characteristic trend in more recent international arrangements for water resources development has been the broadening of the scope and diversity of the parties' international water development activities . . .[155]

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[149] Brierly, *op cit.*, pp. 231–232. This restatement may be compared with the somewhat less advanced formulation by the Institute of International Law in its Madrid resolution of 1911, "International regulations regulating the use of international watercourses" (*Annuaire de l'Institut de droit international, 1911* (Paris), vol. 24, pp. 365–367). See also Griffin, *loc. cit.*, pp. 78–79.

[150] See footnotes 81 and 83 above.

[151] Inter-American Bar Association, *Proceedings of the Tenth Conference held at Buenos Aires from 14 to 21 November 1957* (Buenos Aires, 1958), p. 82. (The text of the resolution is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 208, document A/5409, para. 1092.) See also Inter-American Bar Association, *Principles of Law Governing the Uses of International Rivers and Lakes* (Washington, D.C., U.S. Government Printing Office, 1958), pp. 4–5.

[152] ILA, *Report of the Forty-eighth Conference, New York, 1958* (London, 1959), pp. viii–ix. For the discussion on the topic "uses of the waters of international rivers" at the Conference and in the report of the ILA Committee, *ibid.*, pp. 28–102. (The text of the "agreed principles" is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 204, document A/5409, para. 1082).

[153] Carnegie Foundation for International Peace, *The International Conferences of American States, First Supplement, 1933–1940* (Washington, D.C., 1940), p. 88. (The text is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 212, document A/5409, annex I, A.)

[154] E/C.7/2/Add.6, p. 1, para. 1.

[155] *Ibid.*, p. 2, para. 3.

In response, the Committee on Natural Resources included a section on objectives and priorities in the field of water resources in its "Guidelines for action in the development of natural resources",[156] examined the economic and technical aspects of international river basin development[157] and recommended the holding of a United Nations water conference.[158] Meanwhile, ECE had adopted, as part of its declaration of policy on water pollution control, a series of principles recommended by a meeting of governmental experts, including these points:

1. Water pollution control constitutes a fundamental governmental responsibility and calls for close international collaboration . . . All problems concerning the rational utilization of water resources should be viewed in relation to the special features of each drainage area.

. . .

9. States bordering on the same surface water should reach an understanding to the effect that such water represents for them a common asset, the use of which should be based on the desire to reconcile their respective interests to the greatest possible extent . . .[159]

In 1971, the ECE Committee on Water Problems approved recommendations concerning river basin management, citing

. . . growing demands, including more stringent needs for high quality water, in conjunction with the natural fluctuations and the growing pollution of the water resources, [which] have caused water shortages to occur in more and more regions . . . only careful planning and rational management of the allocation, utilization and conservation of water resources as well as a disciplined use of water for the various legitimate purposes can assure that requirements will be met in the future and that the natural environment will be improved and preserved . . .[160]

80. The Asian–African Legal Consultative Committee devoted several years of study to these problems, creating an Inter-Sessional Sub-Committee on International Rivers in 1967. Several drafts were considered—all embracing the equitable utilization principle. In 1971, a new Sub-Committee was appointed which brought forth a report containing a series of revised draft "propositions". The most relevant for present consideration is proposition III, paragraph 1: "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."[161]

81. The Council of Europe, whose joint Working Party on Fresh Water Pollution Control in 1965 had noted "the existence of the principle that a State must not allow international water passing through its territory to be used without proper regard for the legitimate interests of neighbouring States",[162] promulgated its European Water Charter two years later.[163] The European Water Charter declares: "Water knows no frontiers; as a common resource it demands international co-operation."[164] And: "Within a drainage basin, all uses of surface and underground waters are interdependent and should be managed bearing in mind their interrelationship."[165] The Committee of Ministers of the Council of Europe established an *Ad Hoc* Committee of Experts in 1970 to prepare a draft European convention on the protection of international fresh waters against pollution. The Committee produced its final draft—"European Convention for the Protection of International Watercourses against Pollution"—in 1974, the preamble of which contained this clause:

Convinced of the urgent need for general and simultaneous action on the part of States and for co-operation between them with a view to protecting all water resources against pollution, especially watercourses forming part of an international hydrographic basin;[166]

It affirmed the growing awareness of the requirement of an active collaborative approach to meeting contemporary concerns affecting shared water resources.

82. Another regional intergovernmental organization, the Inter-American Economic and Social Council, declared in its resolution on control and economic utilization of hydrographic basins and streams in Latin America that:

. . . Control and better utilization of hydrographic basins and streams that . . . make up a part of the common patrimony of the member countries . . . will help speed up the integration and multiply the potential capacity for development of those countries.[167]

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[156] See *Official Records of the Economic and Social Council, Fifty-second Session, Supplement No. 5* (E/5097 and Corr. 1), p. 10, para. 20.

[157] *Ibid., Fifty-fourth Session, Supplement No. 4* (E/5247), pp. 27–29, paras. 129–137.

[158] *Ibid.*, p. 25, para. 114.

[159] *Ibid., Forty-first Session, Supplement No. 3* (E/4177), part III. The ECE Committee on Water Problems made recommendations in 1970, focusing on pollution by oil and oil products, that broadened the concern to include ground waters (E/ECE/WATER/7, annex I).

[160] E/ECE/WATER/9, annex II (preamble). See also United Nations, *Management of International Water Resources: Institutional and Legal Aspects*, Natural Resources/Water Series No. 1 (Sales No. E.75.II.A.2), Especially pp. 5–6 and 174–184, paras. 14–20 and 553–586.

[161] Asian–African Legal Consultative Committee, *Report of the Fourteenth Session* (New Delhi, 10–18 January 1973), (New Delhi, 1974), p. 100. For the text of the draft propositions and the Rapporteur's commentary, *ibid.*, p. 9 *et seq.* After extended discussion, the final draft version parallels much of the Helsinki Rules. (The text of the revised draft propositions is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), pp. 339–340, document A/CN.4/274, para. 367.)

[162] Council of Europe, Consultative Assembly, "Report on fresh water pollution control in Europe" (Strasbourg, 1965); see also the "Guiding principles applicable to fresh water pollution control" contained in part III of the report, adopted by the Consultative Assembly in its recommendation 436 (1965) (see *Yearbook . . . 1974*, vol. II (Part Two), pp. 340–342, document A/CN.4/274, paras. 368–372).

[163] Recommendation 493 of the Consultative Assembly of 28 April 1967 and resolution 67 (10) of the Committee of Ministers of 26 May 1967 (*ibid.*, pp. 342–343, para. 373).

[164] Principle XII.

[165] Principle XI, second para.

[166] See *Yearbook . . . 1974*, vol. II (Part Two), p. 346, document A/CN.4/274, para. 377. For the several collaborative activities proposed, see the text of the draft (*ibid.*, pp. 346–348). In the Consultative Assembly's recommendation 629 (1971) on the pollution of the Rhine valley water-table, emphasis was again placed on "the urgent need for such co-operation, which is a proof of both the solidarity existing between frontier regions and the practical nature of the problems calling for common action" (*ibid.*, p. 349, para. 378). Attention may also be drawn to the urgent tone of the directive of 17 December 1979 of the Council of the European Communities on the protection of groundwater against pollution caused by certain dangerous substances (80/68/EEC) (*Official Journal of the European Communities* (Luxembourg), 23rd year, 26 Jan. 1980, No. L.20, p. 43).

[167] Resolution 24-M/66 (Pan American Union, *Final Report of the Fourth Annual Meeting of the Inter-American Economic and Social Council* (Washington, D.C., 1966), vol. I, p. 48). (The text of the resolution is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 351, document A/CN.4/274, para. 380.) The 1965 revised draft Inter-American convention on the industrial and agricultural use of international rivers and lakes contained in its preamble an analogous statement: "The utilization of waters in accordance with modern

The Council then recommended that the countries

> . . . begin or continue joint studies looking towards the control and economic utilization of the hydrographic basins and streams of the region of which they are a part, for the purpose of promoting, through multinational projects, their utilization for the common good, in transportation, the production of electric power, irrigation works, and other uses, and particularly in order to control and prevent damage such as periodically occurs as the result of rises in the level of their waters and consequent floods.[168]

83. Finally, the United Nations Water Conference, held in Mar del Plata, Argentina, in 1977, reaffirmed the principle of equitable utilization and cast its recommendations in terms of co-operative management:

> 90. It is necessary for States to co-operate in the case of shared water resources in recognition of the growing economic, environmental and physical interdependencies across international frontiers. Such co-operation . . . must be exercised on the basis of the equality, sovereignty and territorial integrity of all States, and taking due account of the principle expressed, *inter alia*, in principle 21 of the Declaration of the United Nations Conference on the Human Environment.
>
> 91. In relation to the use, management and development of shared water resources, national policies should take into consideration the right of each State sharing the resources to equitably utilize such resources as the means to promote bonds of solidarity and co-operation.
>
> 92. A concerted and sustained effort is required to strengthen international water law as a means of placing co-operation among States on a firmer basis. The need for progressive development and codification of the rules of international law regulating the development and use of shared water resources has been the growing concern of many Governments.[169]

84. The International Law Association, continuing its work in the field on the recommendations of its Committee on International Water Resources Law, has adopted, *inter alia*, articles on flood control, in which the positive dimension of system States' relationships is emphasized: "Basin States shall co-operate in measures of flood control in a spirit of good neighbourliness, having due regard to their interests and well-being as co-basin States."[170] In 1974, the Association approved articles on maintenance and improvement of naturally navigable waterways separating or traversing several States,[171] and in 1976, at the Madrid Conference, it adopted articles on the protection of water resources and water installations in times of armed conflict[172] and, in addition, articles on international water resources administration,[173] In 1980, the Association approved articles on regulation of the flow of water of international watercourses;[174] work continues on other topics.

4. The proposed article

85. It is submitted that the right of each State to share equitably in the uses of the waters of an international watercourse system is indisputable and undisputed. Moreover, contemporary conditions and expectations have tended to move the international community to a position of affirmative promotion of co-operation and collaboration with respect to shared water resources. Thus the Commission may wish to consider a draft article that not only articulates the settled principle of equitable utilization, but also embraces the progressive concept of "equitable participation". States sharing an international watercourse system not only may stand on their rights to reasonable and equitable sharing of the uses of the waters but, arguably, also have a right to the co-operation of their co-system States in, for example, flood control measures, pollution abatement programmes, drought mitigation planning, erosion control, disease vector control, river regulation (training), the safeguarding of hydraulic works or environmental protection—or some combination of these—as appropriate for the particular time and circumstances. The details of such joint co-operative efforts on the part of system States should be reflected in one or more system agreements. None the less, it may be maintained that there now exists a duty under general international law to participate affirmatively in effectuating the more rational development, use and protection of shared water resources. To the extent that State practice does not establish that duty, it is believed that the progressive development of international law should establish it.

86. The following formulation is accordingly proposed for the consideration of a successor Special Rapporteur and of the Commission.

Article 6. Equitable participation

1. The waters of an international watercourse system shall be developed and used by system States on an equitable basis with a view to attaining optimum utilization of those waters, consistent with adequate protection and control of the components of the system.

2. Without its consent, a State may not be denied its equitable participation in the utilization of the waters of an international watercourse system of which it is a system State.

3. An equitable participation includes the right to use water resources of the system on an equitable basis and the duty to contribute on an equitable basis to the protection and control of the system as particular conditions warrant or require.

87. While the emphasis in this suggested formulation is on the sharing, reasonably and equitably, of uses (paragraph 1), the regional or community goal of maximizing the resource is expressly stated. Moreover,

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technological methods contributes decisively to the economic development of their peoples" (Pan American Union, *Report of the Inter-American Juridical Committee on the Work accomplished during its 1965 Meeting* (Washington, D.C., 1966), p. 7). (See also *Yearbook . . . 1974*, vol. II (Part Two), p. 350, document A/CN.4/274, para. 379.)

[168] Pan American Union, *Final Report . . . (op. cit.)*. (The recommendation is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 351, document A/CN.4/274, para. 380.)

[169] *Report of the United Nations Water Conference, Mar del Plata, 14–25 March 1977* (United Nations publication, Sales No. E. 77.II.A.12), p. 53.

[170] Art. 2 (ILA, *Report of the Fifty-fifth Conference, New York, 1972* (London, 1974), p. xvi). For the report of the Committee on flood control (Rapporteur: F. Berber), including a detailed review of State practice, *ibid.*, pp. 43–97.

[171] ILA, *Report of the Fifty-sixth Conference, New Delhi, 1974* (London, 1976), p. xiii. For the report of the Committee on the topic (Rapporteur: H. Zurbrügg), *ibid.*, pp. 117–128.

[172] ILA, *Report of the Fifty-seventh Conference, Madrid, 1976* (London, 1978), pp. xxxiv–xxxvi. For the report of the Committee on the topic (Rapporteur: F. Berber), *ibid.*, pp. 234–248, and ILA, *Report of the Fifty-sixth Conference . . .*, pp. 129–145 (intermediate report).

[173] ILA, *Report of the Fifty-seventh Conference . . .*, pp. xxxvii–xli, including "Guidelines for the establishment of an international water resources administration". For the report of the Committee on the topic (Rapporteur: D. Caponera), *ibid.*, pp. 239–266.

[174] ILA, *Report of the Fifty-ninth Conference, Belgrade, 1980* (London, 1982) (Chairman and Rapporteur on the topic: E. Manner), pp. 359–393.

the States' right to *use* the waters, in the technical sense of the term, is qualified by protection and control of the system (for example, recognition of the importance of the appropriate regulation of flow and of water quality). River regulation and control (training works and associated measures) often service, it may be said, some of the traditional uses of waters, such as electrical power generation, irrigation, fishing, recreational uses and navigation, and also serve other highly important ends such as flood control, drought mitigation, saline intrusion control and pollution mitigation of direct or indirect concern to all system States.[175] Similarly, the element of "protection", defined to cover, above all, water quality, the environment, security, water-related disease and conservation, calls for measures or works that may limit to some degree the uses that otherwise might be made of the waters by one or more system States. The well-being of the peoples dependent upon the waters of the system, or the socio-economic development of the area, not to mention protection of the marine environment, may give certain measures of protection overriding priority.[176] To be sure, terms as "pollution", "measures of protection", "measures of control" and many others will ultimately require precise definition, probably in a special article on definitions. Suffice it to say at this juncture that the terms employed have precedents and are generally understood and widely employed by water resources specialists.

88. Paragraph 2 of the proposed article simply restates the rule that a system State is *entitled* to its equitable "share", yet broadened to embrace the full scope of a system State's involvement in matters affecting the international watercourse system—its "equitable participation".

89. The third and final paragraph of this article attempts a straightforward delineation of the two "aspects" of the compound principle of equitable participation: the right to use and the duty to contribute, in an equitable manner. The equities are couched in the larger perspective so widely sought: the integrated approach to the development, use and protection of shared international water resources.[177]

90. At the level of general, or residual, rules, it would be difficult to leave "participation" in the protection and control aspects of shared water resources unqualified. Here, the system State's affirmative involvement is considered as much of a "right" as it is a "duty", since the welfare and other vital interests of the system State are often intimately linked to the wise husbanding of the system's water resources and the careful avoidance of water's so-called "harmful effects". What precautionary measures, hydraulic works, warning systems or abatement programmes, among other things, may be required in a particular international watercourse during certain seasons, or longer time periods, can be and are being determined in consonance with the physical and chemical circumstances, the capabilities and needs of the system States and the availability of applicable technology. Effectively to avert the threat of flooding for the indefinite future (for example) would probably necessitate major hydraulic works and land-use measures requiring in all likelihood quite elaborate systems agreements; this residual rule should not pretend too much. For that reason, the final phrase, "as particular conditions warrant or require", has been used to qualify the expectation (or, conversely, the duty) in relation to need and to justification.

91. This suggested advance to the principle of "equitable participation" is in no way a retreat from the accepted principle of equitable utilization or apportionment. On the contrary, equitable participation assumes, includes and articulates equitable utilization as the fundamental rule, but places it in the larger context of the system States' need and willingness to give attention to critical matters of common interest respecting shared water resources which may be ancillary to uses or at best only indirectly related to uses. This larger approach—the integrated approach, scientifically so essential to the water-related aspects of the welfare of system States—was not covered conceptually by the traditional terminology addressed to uses and to "dividing" quantities of water, despite efforts of governmental and non-governmental bodies to make the terms embrace quality, hazard and conservation concerns. In the suggested text, the principle of equitable sharing of the uses of the waters is preserved, and the

[175] See the review of State practice, definitions and examples and draft articles on "Regulation of the flow of international watercourses" in the report of the Committee on International Water Resources Law (ILA, *Report of the Fifty-eighth Conference, Manila, 1978* (London, 1980), pp. 219–237), and the discussion at the Working Session at Manila (*ibid.*, pp. 238–247). For the final version of these articles, with commentary, as approved by the Association in Belgrade in 1980, see the report of the Committee on International Water Resources Law (ILA, *Report of the Fifty-ninth Conference* . . ., p. 359).

[176] The elaboration of control and protection principles obviously calls for separate, specific consideration. At this juncture references are given, for purposes of illustration only, concerning flood control (see footnote 170 above) and security measures (see footnote 172 above), since works on these topics are less widely known than, for example, works on pollution and environmental protection.

[177] See, as a recent expression of this action-oriented framework, the conclusions of the United Nations Interregional Meeting of International River Organizations (Dakar, Senegal, 5–14 May 1981), e.g.:

"1. Some co-operating States need to provide their international river and lake organizations with both competence and capability to deal effectively with the existing and impending demands for improved water resources development, use and protection . . .

. . .

"3. Where benefits and costs are to be shared, international river and lake organizations could be empowered to recommend to their respective Governments the general or specific formulas and rules for such sharing . . .

"4. Water quality, water-related disease and environmental protection considerations have to date received inadequate attention in most cases . . .

"5. The prevention and mitigation of floods, droughts and other hazards, natural and man-made, are increasingly of concern to the co-operating States because of the numerous changes that are taking place at accelerating rates within the watersheds; therefore, new or strengthened activities must be undertaken to deal effectively with the detrimental effects of water-related hazards and conditions . . .

"6. Those co-operating States that have not yet included groundwater as a part of the shared water resources system need to recognize this part of the hydrologic cycle as intimately linked to the quantity and quality of their shared surface waters . . .

. . .

"15. A manual on each of the numerous technical and managerial aspects of the development, use and protection of shared water resources systems would be a highly useful product . . ."

(United Nations, *Experience in the Development and Management of International River and Lake Basins*, Natural Resources/Water Series No. 10 (Sales No. E.82.II.A.17), pp. 14–15, para. 49. See also the note on the meeting prepared by L. Johnson, of the secretariat of the International Law Commission, and circulated to the Commission at the request of the Chairman (ILC (XXXIII)/Conf. Room Doc. 11, para. 11), and chap. III, D, 4, of the present report.

developing principle, heretofore not succinctly articulated, that reflects the States' recognition of the need to act affirmatively in the protection and control of shared water resources, is proffered.[178]

C. Clarifying the ascertainment of equitable use

92. Although the international community of States has accepted the principle of equitable utilization, the difficulty of the application of that principle is readily recognized. That problem arose from the very beginning, and has not been ameliorated by the fact that sovereign States sharing an international watercourse system, in contrast with States of a federal system, have rarely bound themselves to the compulsory jurisdiction of an arbitral or adjudicatory tribunal with competence to make legally binding determinations in this field.

1. The *Lake Lanoux* arbitration

93. In the *Lake Lanoux* arbitration between France and Spain in 1957, the Tribunal observed:

> Consideration must be given to all interests, whatever their nature, which may be affected by the works undertaken, even if they do not amount to a right.[179]

The Tribunal considered that:

> . . . the upper riparian State, under the rules of good faith, has an obligation to take into consideration the various interests concerned, to seek to give them every satisfaction compatible with the pursuit of its own interests and to show that it has, in this matter, a real desire to reconcile the interests of the other riparian with its own.[180]

In short:

> France may use its rights; it may not disregard Spanish interests;
>
> Spain may demand respect for its rights and consideration of its interests.[181]

2. Proposals submitted to the Asian–African Legal Consultative Committee

94. In 1973, the Sub-Committee on International Rivers of the Asian–African Legal Consultative Committee submitted to the Committee its revised draft propositions, including, as paragraph 3 of proposition III, its conclusions on the question of relevant factors:

> 3. Relevant factors which are to be considered include in particular:
>
> (*a*) the economic and social needs of each basin State, and the comparative costs of alternative means of satisfying such needs;
>
> (*b*) the degree to which the needs of a basin State may be satisfied without causing substantial injury to a co-basin State;
>
> (*c*) the past and existing utilization of the waters;
>
> (*d*) the population dependent on the waters of the basin in each basin State;
>
> (*e*) the availability of other water resources;
>
> (*f*) the avoidance of unnecessary waste in the utilization of waters of the basin;
>
> (*g*) the practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among users;
>
> (*h*) the geography of the basin;
>
> (i) the hydrology of the basin;
>
> (*j*) the climate affecting the basin.[182]

3. Resolutions of the International Law Association

95. The Sub-Committee on International Rivers of the Asian–African Legal Consultative Committee may have taken into account the earlier work of the International Law Association in this sphere. At its Dubrovnik Conference in 1956, the International Law Association adopted a statement of principles, principle V of which identified the following factors, among others, that should be taken into consideration by system States in reaching agreements or in settling disputes, directly by negotiation, or through decisions of tribunals:

> (*a*) the right of each to a reasonable use of the water;
>
> (*b*) the extent of the dependence of each State upon the waters of that river;
>
> (*c*) the comparative social and economic gains accruing to each and to the entire river community;
>
> (*d*) pre-existent agreements among the States concerned;
>
> (*e*) pre-existent appropriation of water by one State.[183]

Principle VIII adopted at Dubrovnik provided that:

> So far as possible, riparian States should join with each other to make full utilization of the waters of a river both from the viewpoint of the river basin as an integrated whole, and from the viewpoint of the widest variety of uses of the water so as to assure the greatest benefit to all.[184]

At its New York Conference, in 1958, the International Law Association reviewed the next report of its Committee on the Uses of the Waters of International Rivers and adopted its four proposed "Agreed principles of international law". The second principle affirmed the "reasonable and equitable share in the beneficial uses" rule, adding: "What amounts to a reasonable and equitable share is a question to be determined in the light of all the relevant factors in each particular case".[185] No list of factors, however, was set forth at New York.

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[178] See in this connection the background papers for the 1981 Dakar Interregional Meeting, addressed to "countries which share water resources but yet have no established basin-wide institutional framework" (as stated in resolution VII of the United Nations Water Conference, held at Mar del Plata in 1977), as well as to existing international river commissions and their States members, in particular the following: "Institutional and legal arrangements" (Rapporteur: G. J. Cano) (United Nations, *Experiences in the Development and Management* . . ., p. 44; "Progress in co-operative arrangements" (Rapporteur: R. D. Hayton) (*ibid.*, p. 65); "Economic and other considerations for co-operation in the development of shared water resources" (Rapporteurs: K. E. Hansson and R. Revesz) (*ibid.*, p. 82); "River basin planning: observations from international and Canada–United States experience" (Rapporteur: M. Cohen) (*ibid.*, p. 107); "Role of environmental factors in internationally shared water resources", by V. R. Pantulu, Mekong Secretariat (mim.).

[179] *Yearbook . . . 1974*, vol. II (Part Two), p. 198, document A/5409, para. 1068. The Tribunal, in an examination of the "complaints" mentioned in art. 11 of the Additional Act to the Treaty of Bayonne of 26 May 1866 between France and Spain, was assaying "how 'all the interests involved on one side and the other' should be safeguarded" (*ibid.*). For the full text of the award, see United Nations, *Reports of International Arbitral Awards*, vol. XII . . ., p. 285 (in French).

[180] *Yearbook . . . 1974*, vol. II (Part Two), p. 198, document A/5409, para. 1068.

[181] *Ibid.*

[182] For the text of the draft propositions and the Rapporteur's commentary, see footnote 161 above. The text of proposition III is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 339, document A/CN.4/274, para. 367.

[183] ILA, *Report of the Forty-seventh Conference, Dubrovnik, 1956* (London, 1957), pp. 241–243. (The text is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 203, document A/5409, para. 1080.)

[184] *Ibid.*

[185] ILA, *Report of the Forty-eighth Conference* . . ., p. 100. The

(*Continued on next page.*)

96. Finally, in 1966, the ILA Committee made its final report, proposing articles which, approved by the Conference, became the "Helsinki Rules on the Uses of the Waters of International Rivers". Chapter 2 of the Helsinki Rules, entitled "Equitable utilization of the waters of an international drainage basin", contains five articles. The first, article IV, has been considered in the immediately preceding section on equitable participation; the second, article V, deals squarely with the question of factors:

Article V

(1) What is a reasonable and equitable share within the meaning of article IV 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 basin in the territory of each basin State;

(*b*) the hydrology of the basin, including in particular the contribution of water by each basin State;

(*c*) the climate affecting the basin;

(*d*) the past utilization of the waters of the basin, including in particular existing utilization;

(*e*) the economic and social needs of each basin State;

(*f*) the population dependent on the waters of the basin in each basin State;

(*g*) the comparative costs of alternative means of satisfying the economic and social needs of each basin State;

(*h*) the availability of other resources;

(*i*) the avoidance of unnecessary waste in the utilization of waters of the basin;

(*j*) the practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and

(*k*) the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

(3) The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.[186]

97. Only limited guidance is offered even in the unofficial commentary to article V regarding the weight to be accorded to any of the factors named.[187] What is intended is "flexible guidelines essential to ensuring the protection of the 'equal right' of all basin States to share the waters"; particular cases might call into consideration other factors.[188] Each relevant factor is to be "given such weight as it merits relative to all the other factors. And no factor occupies a position of pre-eminence *per se* . . ."[189] Article VI expressly provides, moreover, that a use or category of uses "is not entitled to any inherent preference over any other use or category of uses".[190] Nonetheless, the commentary explains that if a use (using domestic use as the example) "is indispensable—since it is, in fact, the basis of life—it would not have difficulty in prevailing on the merits against other uses . . ."[191]

98. Article VII of the Helsinki Rules makes an express limitation to the process of weighing of factors: "A basin State may not be denied the *present** reasonable use of the waters . . . to reserve for a co-basin State a *future** use of such waters."[192] Aimed at allowing the optimum utilization at any given time, the article implies that "future readjustment" could take place when the co-basin State's "future use" becomes, or is in the process of becoming, a reality. This flexibility over time is inherent in the concept of equitable utilization in the Helsinki Rules, permitting accommodation to changes of use as the system States' patterns of development and activity change. But the uses of other system States may not be curtailed so long as implementation of a planned use by a system State still lies in the future.[193] "When the latter is ready to use the waters or to increase an existing use, then the entire question of equitable utilization of the waters is opened up for review . . . and the rights and needs of the various States will be considered."[194] Clarification of this potential jeopardy to existing uses is contained in paragraph 1 of article VIII:

1. An existing reasonable use may continue in operation unless the factors justifying its continuance are outweighed by other factors leading to the conclusion that it be modified or terminated so as to accommodate a competing incompatible use.[195]

Finally, paragraph 3 of article VIII contains the rule that a use "will not be deemed an existing use if at the time of becoming operational it is incompatible with an already existing reasonable use".[196]

4. Implications of international agreements

99. International agreements between system States may, in many cases, be regarded as the parties' *de facto* determination of equitable utilization or equitable apportionment, even though neither phrase had come

(*Footnote 185 continued.*)

comment to the first principle, recommending treatment of a system of rivers and lakes in a drainage basin "as an integrated whole (and not piecemeal)", pointed out: "Until now international law has for the most part been concerned with surface waters, although there are some precedents having to do with underground waters. It may be necessary to consider the interdependence of all hydrological and demographic features of a drainage basin" (*ibid.*). (The text is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 204, document A/5409, para. 1082.)

[186] ILA, *Report of the Fifty-second Conference . . .*, p. 488. (The text of the Helsinki Rules is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), pp. 357–358, document A/CN.4/274, para. 405.) Lipper, reflecting on the practice of the United States Supreme Court in determining an equitable utilization, "the balancing process", observes that

"it may be relevant to consider the nature of the land along the banks of the river, the extent of the dependence of the riparians on the river's flow, the volume of diversion, the size of the river's watershed or drainage area and the possibility of maintaining a sustained flow through the controlled use of flood waters. Of course, an emergency may require special consideration and extraordinary measures for its duration. There are numerous other factors which come to mind: *inter alia*, the quality of the waters after use by the upper riparian, the seasonal variations in diversions, the contribution of water by each riparian, the availability of storage facilities or the ability to construct them, the availability of other resources, the extent to which water is or could be returned to the river after use (return flow) and the suitability of the water for the purpose desired" (Lipper, *loc. cit.*, p. 49). Smith regarded necessity, justification, motive and material injury as relevant in "The Chicago diversion", *The British Year Book of International Law, 1929* (London), vol. 10, p. 155.

[187] In the commentary, however, hypothetical examples are discussed at some length (ILA, *Report of the Fifty-second Conference . . .*, pp. 488–491).

[188] *Ibid.*, p. 488.

[189] *Ibid.*, p. 489.

[190] *Ibid.*, p. 491.

[191] *Ibid.*, pp. 491–492.

[192] *Ibid.*, p. 492.

[193] See the commentary to art. VII (*ibid.*, pp. 492–493).

[194] *Ibid.*, p. 493.

[195] *Ibid.*

[196] *Ibid.* Para. 2 deals with the timing of the coming into existence of a use and use abandonment.

into common usage by the time most such treaties were drafted.[197] Direct negotiations led to those determinations, and direct negotiations will undoubtedly in the future play a similarly dominant role.[198] The "balancing process" may also become the task of an international tribunal or conciliation commission, or be entrusted to the parties' international river commission. In any event, those charged with working out an ascertainment of the sharing of uses on an equitable basis need, as points of departure, the firmest foundations that international law can provide. Even though, in the absence of a controlling agreement between the parties, international judicial or arbitral decisions *directly* to the point are not to be found,[199] the interest of States in the codification and progressive development of legal principles and rules in this complex and seemingly imponderable area clearly persists.[200]

100. At one juncture, in connection with discussions with Canada concerning proposed diversions by Canada from the Kootenay River into the Columbia and from the Columbia into the Fraser River, the United States Department of State prepared a memorandum. In the conclusions to that document, which stated that riparians "possess equal rights on either side . . . and these rights reciprocally restrict the freedom of action of the others", the following appears on this matter of factors:

(*a*) Riparians are entitled to share in the use and benefits of a system of international waters on a just and reasonable basis.

(*b*) In determining what is just and reasonable account is to be taken of rights arising out of—

(1) Agreements,

(2) Judgments and awards, and

(3) Established lawful and beneficial uses;

and of other considerations such as—

(4) The development of the system that has already taken place and the possible future development, in the light of what is a reasonable use of the water by each riparian;

(5) The extent of the dependence of each riparian upon the waters in question; and

(6) Comparison of the economic and social gains accruing, from the various possible uses of the waters in question, to each riparian and to the entire area dependent upon the waters in question.[201]

101. The cumulative achievements to date in delineating what is, and what is not, equitable use clearly leave room for improvement. They suggest the desirability of an authoritative rule, be it only minimal, for the guidance of system States and of the various forums within which equitable calculations may be undertaken. At the same time no automatically applicable fixed sets of factors, or a given formula for ranking or weighing the factors, can be devised that would fit all situations.

102. Ideally, system States should create, where they have not already done so, the necessary machinery for authoritative ascertainment of equitable utilization whenever the need arises. And this machinery for ascertainment of equitable use, as well as for working out the technical and compensatory adjustments that often are required, should not in the first place be considered "dispute settlement". Rather, such determinations, including where necessary their attendant, often complex, shaping of the package of modifications of use and of measures for avoidance of harm, need to be an integral part of the system States' affirmative co-operation in their international watercourse system. In the past, such machinery has been lacking in most international watercourse systems, and the defensive, one might say "adversary", context within which use conflicts were taken up all too often gave rise to acrid and protracted disputes.

103. It was not without reason, grounded in experience, that the Inter-American Juridical Committee set

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[197] See the review of treaties on the sharing of the waters of international watercourses in sect. B above.

[198] There apparently is broad accord, moreover, that some *mutual* rights and responsibilities exist, as aptly stated by S. Cardona: "The internationality of river basins presupposes a combination of rights and duties that are common to the neighbouring States . . . It follows that the legal order that governs this combination of rights and duties affects the exercise of the territorial sovereignty of each State over its own territory" ("El régimen jurídico de los ríos internacionales", *Revista de derecho internacional* (Havana), vol. LVI, 1949, p. 26). In the Act of Santiago concerning hydrologic basins ("utilization of the waters common to the two countries") signed by Argentina and Chile in 1971, a number of rules are set forth, the first, basic one of which reads: "The waters of rivers and lakes shall always be utilized in a fair and reasonable manner." (The text of the Act is reproduced in part in *Yearbook . . . 1974*, vol. II (Part Two), p. 324, document A/CN.4/274, para. 327.) A similar declaration on water resources by Argentina and Uruguay (Buenos Aires, 1971), seeks "to ensure a reasonable and fair participation by the States in the use and benefits of the waters of international rivers and their tributaries", confirms *inter alia*, the principles outlined in the 1933 Montevideo Declaration, and records the "common will of their two peoples to develop new and effective forms of co-operation and rapprochement . . ." (*ibid.*, pp. 324–325, para. 328). The provisions of the Act of Buenos Aires on hydrographic basins, signed by Bolivia and Argentina in 1971, are broadly similar (*ibid.*, p. 325, para. 329).

[199] The federal country experience can, however, be instructive to the negotiator, arbiter, judge or conciliator. One such example identifying and weighing factors is *New Jersey* v. *New York* (1931) (*United States Reports*, 1931, vol. 283, p. 336), where New York proposed to divert Delaware River waters for drinking purposes and New Jersey objected. The diversion was found reasonable by the Court: it would have little effect on the water supply, agricultural output and sanitary conditions of New Jersey. On the other hand, oyster fisheries and recreational uses would receive substantial injury. The Court applied the formula of maximum benefit/minimum detriment to reconcile the parties' interests and reduced the diversion sought by New York substantially (averting the injury to the oyster fisheries), directed New York to construct a sewer plant (rendering the water's quality safe for recreational uses), and ordered New York to maintain a specified minimum flow. The "factors" and their disposition obviously are always related to the particular case.

[200] The application of the equitable utilization doctrine has not only occupied the Asian-African Legal Consultative Committee over a period of years, as noted above, but, at the 1981 Dakar Interregional Meeting, including States interested in forming or strengthening river basin commissions, participants repeatedly called for progress in this area. See United Nations, *Experiences in the Development and Management* . . ., pp. 8, 14, 15, 16, 17, 19, paras. 27, 49 (3) and (15), 51–57, 67. See also the note prepared by a member of the secretariat of the International Law Commission and circulated to members of the Commission (ILC (XXXIII/Conf. Room Doc. 11), paras. 10, 12–13.

[201] United States of America, Memorandum of the Department of State, "Legal aspects of the use of systems of international waters . . ." (*op. cit.*), p. 90, quoted in Whiteman, *op. cit.*, p. 940. The comment following the quoted passage reads:

"The foregoing is an attempt to formulate the factors which would be considered in applying the doctrine of 'equitable apportionment' because whatever the situation—whether in negotiation or before a tribunal—more guidance is needed than is contained in the words 'equitable apportionment'. Other factors should doubtless be included.

"Perhaps an additional factor would be that the order of priority of uses of a particular system would be the relative importance of the possible different uses to the international area served by the system. It is doubtful that a statement of priority among uses of water for all systems could be made as a matter of existing law. On some systems the navigational use [would be] of paramount importance; on the others irrigation would surely come next after drinking and domestic uses."

forth the view "that if it is desired to take a truly effective step in this difficult field, a careful and rigid procedure must be established—one that will not permit of evasion or undue delay in the settlement of controversies".[202] While one may question the choice of the term "rigid", the Committee's rationale, and its preoccupation with avoidance of delay in matters affecting the utilization of international watercourse systems, strike responsive chords among international water resources specialists.[203]

104. The widely emphasized development goals, dependent as their realization is upon increasingly critical water supply and water quality conditions found in international watercourses, in many cases tend to drive system States towards active collaboration in (if not integrated management of) their shared water resources. The frequently urgent need for protection of the resource, and of populations served by the resource, from harmful effects created or enhanced by particular uses and by natural hazards, is stimulating such collaboration in more and more instances.[204]

105. Clearly there is ample justification for a recommendation that system States institutionalize their arrangements for ascertainments about equitable utilization. As a matter of duty under international law, as it may be progressively developed, the Commission may be able to recognize the modern attitude of many States and facilitate, if only in a residual way, the knotty process of arriving at just determinations about the equitableness of a particular use by a particular system State under the prevailing circumstances. The factors already articulated and set forth above are, or may be, substantively relevant in this regard. Except for resort to dispute settlement procedures, however, prior conceptualizations of the problem have not provided a mechanism for triggering the required balancing task. This task should be discharged in a co-operative atmosphere, initiated by the exercise of a right by the system State or States concerned.

5. The proposed article

106. The following draft article is accordingly proposed for the consideration of a successor Special Rapporteur and the Commission:

Article 7. Determination of equitable use

1. The right of a system State to a particular use of the water resources of the international watercourse system depends, when questioned by another system State, upon objective evaluation of:

(*a*) that system State's

(i) contribution of water to the system, in comparison with that of other system States,

(ii) development and conservation of the water resources of the system,

(iii) degree of interference, by such use, with uses or protection and control measures of other system States,

(iv) other uses of system water, in comparison with uses by other system States,

(v) social and economic need for the particular use, taking into account available alternative water supplies (in terms of quantity and quality), alternative modes of transport or alternative energy sources, and their cost and reliability, as pertinent,

(vi) efficiency of use of water resources of the system,

(vii) pollution of system water resources generally and as a consequence of the particular use, if any,

(viii) co-operation with other system States in projects or programmes to attain more optimum utilization and protection and control of the system, and

(ix) stage of economic development;

(*b*) the total adverse affect, if any, of such use on the economy and population of other system States, including the economic value of and dependence upon existing uses of the waters of the system, and the impact upon the protection and control measures of the system States;

(*c*) the efficiency of use by other system States;

(*d*) availability to other system States of alternative sources of water supply, energy or means of transport, and their cost and reliability, as pertinent;

(*e*) co-operation of other system States with the system State whose use is questioned in projects or programmes to attain optimum utilization and protection and control of the system;

2. The determination, in accordance with paragraph 1 of this article, of the equitableness of a use as part of a system State's equitable participation shall be undertaken through good faith consultations among the system States concerned at the request of any system State.

3. Failure to reach agreement on such a requested determination within a reasonable time entitles any system State participating in the consultations to invoke the means provided in these articles for the pacific settlement of disputes.

107. In part, the proposed article represents a consolidation and reworking of the "factors" developed previously and set forth earlier in this section. In addition, however, it represents an amplification of the pertinent considerations to include the aspects—of actual and growing importance—of protection and control embraced in section B above and by the proposed article on equitable participation. If the principle of equitable participation finds favour with a successor Special Rapporteur and the Commission, it then follows that ascertainment of the equitableness of a utilization should take relevant aspects of system State co-operation into account.[205]

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[202] Pan American Union, *Industrial and Agricultural Use of International Rivers and Lakes* (Washington, D.C., 1963), quoted in Whiteman, *op. cit.*, p. 939.

[203] See e.g. United Nations, *Management of International Water Resources* . . ., pp. 144–153, 179–180, paras. 457–484 and 576–580.

[204] For a review of instances of this affirmative stance, see sect. B above.

[205] In 1967, in preambular para. 3 of its resolution requesting the Permanent Committee on Use of International Rivers and Lakes to pursue its studies, the Inter-American Bar Association declared:

"International waters have for America unique importance to the extent that it is difficult to imagine a social and economic development and integration of the continent without an equitable

108. Probably no specific mechanism or method could be required to accomplish the "objective evaluation" called for in paragraph 1 of the article.[206] Many substantial suggestions for, or employment of, conciliation, technical commissions of inquiry, joint fact-finding task forces, etc., have been made by various bodies and by States.[207] Since it is here presumed that the system States are not, at least at this initial stage, in a posture of formal dispute, the choice of means is left to the participating Governments, except that they must enter into consultations in good faith.[208] If such consultations, or more formal negotiations, do not yield acceptable results, the parties may of course agree to any other means of peaceful settlement; in the absence of such agreement, the article allows any participant system State to call into play the provisions for settlement or avoidance of disputes, including those respecting equitable participation determinations, which it is contemplated that the Commission (or, failing that, a diplomatic conference) will in due course include among the articles of a convention on this topic. A proviso for avoiding the application of this final, third paragraph by agreement among the participants to resort to other means of settlement of their own choosing might have been included here; however, it seemed preferable to leave the paragraph as a straightforward procedural step and to incorporate recognition of the parties' freedom of choice, by agreement, in the specialized article or articles on settlement of disputes.

109. It is believed that every practical effort should be made to foster resolution of differences among system States by means short of international arbitration or adjudication. In matters affecting the development, use, protection or control of vital water resources, few countries now or in the future may be able to afford the delays and disruptions often entailed in protracted dispute settlement procedures even if the States concerned are otherwise prepared to resort to such procedures. To be sure, recourse to third-party settlement must be preserved and nurtured, but as a last resort.

110. The present article focuses on only one kind of likely difference between system States: the ascertainment of rights to use water on an equitable basis. Perhaps other aspects of international water resources system management involve potential conflict as consequential as does equitable utilization. History teaches us that at least to this area special attention should be devoted. Problems involving environmental protection, and claims of appreciable harm or failure to control (when under a duty to do so) a water-related hazard, should also be resolvable fairly and with dispatch.

D. Responsibility for appreciable harm

111. It is difficult today to find dissent from the general proposition that a State may not use, or allow persons under its jurisdiction or control to use, its territory in such a way that harm is caused to the territory or interests of another State.[209] The United

and adequate usage of such waters, in achieving which the law has a substantial function" (Inter-American Bar Association, *Resolutions, Recommendations and Declarations approved by the XV Conference* (San José, Costa Rica, 10–15 April 1967, pp. 1–2). See also the Association's resolution on the legal aspects of the problem of contamination of waters of international rivers and lakes (Inter-American Bar Association, *Resolutions, Recommendations and Declarations approved by the XVI Conference* (Caracas, Venezuela, 1–8 November 1969). (The text of the resolutions is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), pp. 356–357, document A/CN.4/274, paras. 401 and 402.)

[206] Although understandably dispute-oriented, the Tribunal in the *Lake Lanoux* arbitration had this to say with respect to evaluation:

"It is for each State to evaluate in a reasonable manner and in good faith the situations and the rules which will involve it in controversies; its evaluation may be in contradiction with that of another State; in that case, should a dispute arise the Parties normally seek to resolve it by negotiation or, alternatively, by submitting to the authority of a third party" (*International Law Reports, 1957*, p. 132) (see also United Nations, *Reports of International Arbitral Awards*, vol. XII . . ., pp. 310–311 (in French)).

[207] See *inter alia* the provisions on conciliation in paras. 7–10 of the Montevideo Declaration adopted by the Seventh International Conference of American States (Carnegie Foundation for International Peace, *The International Conferences of American States . . . (op. cit.)*, p. 89); the provisions for a permanent technical committee in the 1963 draft convention of the Inter-American Juridical Committee (Pan American Union, *Industrial and Agricultural Use of International Rivers and Lakes (op. cit.)*, p. 24), quoted in Whiteman, *op. cit.*, p. 939, and art. 9 (II) of the Committee's revised draft (1965), concerning the establishment of a joint commission (Pan American Union, *Report of the Inter-American Juridical Committee on the Work accomplished during its 1965 Meeting (op. cit.)*, pp. 7–10); the provisions for permanent joint commissions in the "Madrid resolution" of the Institute of International Law (*Annuaire de l'Institut de droit international, 1911*, p. 367); the provisions for an *ad hoc* commission of the International Law Association (ILA, *Report of the Forty-ninth Conference, Hamburg, 1960*) (London, 1961), pp. xvi–xviii); the provisions in articles XXXI–XXXIII of the Helsinki Rules for referral to a joint agency, then to good offices or mediation, a commission of inquiry or an *ad hoc* conciliation commission (ILA, *Report of the Fifty-second Conference . . .*, pp. 524–528); the provision in the 1960 Indus Waters Treaty between India and Pakistan, annex F, for referral to a "neutral expert." (United Nations, *Treaty Series*, vol. 419, p. 202); the provision in art. 9 (4) of the 1954 Treaty between Switzerland and Austria on the regulation of the Rhine for referral to "an independent and impartial specialist" (United Nations, *Legislative Texts . . .*, p. 506); and the provision in art. 94 of the 1929 Agreement concerning the frontier between Germany and Belgium for a joint administrative commission of foreign office and sectoral ministry representatives (League of Nations, *Treaty Series*, vol. CXXI, p. 379).

[208] The *Lake Lanoux* Tribunal, interpreting article 16 of the Additional Act under consideration, held that the provision raised "a duty of consultation and of bringing into harmony the respective actions of the two States when general interests are involved in matters concerning waters" (*International Law Reports, 1957*, p. 133).

"Further, in order for negotiations to proceed in a favourable climate, the Parties must consent to suspend the full exercise of their rights during the negotiations. It is normal that they should enter into engagements to this effect. If these engagements were to bind them unconditionally until the conclusion of an agreement, they would, by signing them, lose the very right to negotiate; this cannot be presumed" (*ibid.*, p. 134). (See also United Nations, *Reports of International Arbitral Awards*, vol. XII . . ., pp. 310–311 (in French).)

The article here proposed to the Commission does not attempt to codify the presumably amicable consultation process; procedural rules, however, may be required under articles on accommodation of differences and settlement of disputes.

[209] In support of the proposition, see, *inter alia*, Andrassy, "Les relations internationales de voisinage", *Recueil des cours . . ., 1951–II* (Paris, Sirey, 1952), t. 79, especially pp. 169–176 ("aménagement des eaux communes"), pp. 102–129, 177–178 and bibliography, pp. 179–180; also, by the same author, "L'utilisation des cours des bassins fluviaux internationaux", *loc. cit.*, pp. 23–40, and "Nachbarrecht und Wassernutzung", *Völkerrecht und rechtliches Weltbild—Festschrift für Alfred Verdross* (Vienna, Springer, 1960), pp. 55–56; Bourne, "International law and pollution of international rivers and lakes", *University of British Columbia Law Review* (Vancouver), vol. 6, 1971, p. 126, and by the same author, "Procedure in the development of international drainage basins: the duty to consult and to negotiate", *The Canadian Yearbook of International Law* (Vancouver), vol. X, 1972, p. 212; J. J. A. Salmon, "La pollution des fleuves et des lacs et le droit international", reports and draft resolutions submitted at the Athens session of the Institute of International Law (*Annuaire de l'Institut de droit international, 1979*

(*Continued on next page.*)

States described its view of international law on the point in the following terms to the General Assembly in 1962:

. . . In the absence of specific treaty provisions to the contrary, the trend of [customary international] law was that no State might claim to use the waters of an international river in such a way as to cause material prejudice to the interests of other States, and that no State might oppose the use of river waters by other States unless that use caused material prejudice to its own interests.[210]

112. The Secretary-General of the United Nations as early as 1949 had expressed the view that "there has been general recognition of the rule that a State must not permit the use of its territory for purposes injurious to the interests of other States".[211] The arbitral tribunal in the *Trail Smelter* case held that, "under the principles of international law, . . . no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another . . ., when the case is of serious consequence and the injury is established by clear and convincing evidence".[212]

(*Footnote 209 continued*)

(Basel), vol. 58, Part One, p. 193); L. Oppenheim, *International Law: a Treatise*, 8th edition, H. Lauterpacht ed. (London, Longmans, Green, 1955), vol. I, pp. 345–347 and 474–476; A.-Ch. Kiss, *L'abus de droit en droit international* (Paris, Librairie générale de droit et de jurisprudence, 1953); F. A. von der Heydte, "Das Prinzip der guten Nachbarschaft im Völkerrecht", *Völkerrecht und rechtliches Weltbild . . . (op. cit.)*, pp. 133–145, and by the same author, "Le principe du bon voisinage en droit international", *Revista da Faculdade de Direito da Universidade de Lisboa* (Lisbon), vol. XV, 1962, pp. 279–292; E. Suy, "Réflexions sur la distinction entre la souveraineté et la compétence territoriale", *Internationale Festschrift für Alfred Verdross zum 80. Geburtstag* (Munich, Fink, 1971), pp. 493 *et seq.*; R. W. Ianni, "International and private actions in transboundary pollution", *The Canadian Yearbook of International Law*, (Vancouver), vol. XI, 1973), p. 258; Barberis, *Los recursos . . ., op. cit.*, especially pp. 28–30 and 150–154 , and works and practice there cited; J. Ballenegger, *La pollution en droit international: la responsibilité pour les dommages causés par la pollution transfrontière* (Geneva, Droz, 1975), especially pp. 21 and 72. See also B. Cheng, *General Principles of Law as Applied by International Courts and Tribunals* (London, Stevens, 1953), p. 130; Lederle, "Die Donauversinkung", *Annalen des Deutschen Reichs* (Munich, 1917), p. 693; M. Decleva, *L'utilizzazione delle acque nel diritto internazionale* (Trieste University, 1939, 1st year, ser. 2, fasc. 3–4), p. 85; H. Jaeger, "Das Recht der wirtschaftlichen Nutzung mehrstaatlicher Gewässer", *Berichte des Wirtschafts- u. Verkehrsministeriums, Nordrhein-Westfalen* (Düsseldorf, 1952), No. 16, p. 39; J. F. Hostie, "Problems of international law concerning irrigation of arid lands", *International Affairs* (London), vol. XXXI, No. 1, 1955, p. 61; Jiménez de Aréchaga, *loc. cit.*, p. 320; M. Wolfrom, *L'utilisation à des fins autres que la navigation des eaux des fleuves, lacs et canaux internationaux* (Paris, Pedone, 1964), p. 143; Ch. Bédard, *Le régime juridique des Grands lacs de l'Amérique du Nord et du Saint Laurent* (Quebec, Laval University Press, 1966), pp. 129–130; G. Herczegh, "Some legal questions of the utilization of the waters of international rivers", *Questions of International Law* (Budapest, Hungarian Branch of ILA, 1968), p. 117; C. A. Colliard, "Evolution et aspects actuels du régime juridique des fleuves internationaux", *Recueil des cours . . ., 1968–III* (Leyden, Sijthoff, 1970), vol. 125, p. 336; G. Reitzenstein, *Das Recht der Staaten an gemeinsamen Flüssen* (Borna-Leipzig, Noske, 1911), pp. 31–58.

[210] *Official Records of the General Assembly, Seventeenth Session, Sixth Committee*, 764th meeting, para. 20. Twenty years earlier the Legal Adviser of the Department of State had concluded: "No one of [the agreements he had reviewed relating to "the use of rivers and lakes having an international aspect"] adopts the early theory advanced by Attorney General Harmon . . . On the contrary, the rights of the subjacent State are specifically recognized and protected by these agreements" (cited in Whiteman, *op. cit.*, p. 950).

[211] United Nations, *Survey of International Law*, (Sales No. 1948.V.1 (1)), p. 34, para. 57.

[212] United Nations, *Reports of International Arbitral Awards*, vol. III, p. 1965. (See also *Yearbook . . . 1974*, vol. II (Part Two), p. 194, documents A/5409, para. 1054.) Although the case was one of air pollution, the tribunal relied on analogous precedents involving water. In its judgment of 9 April 1949 on the *Corfu Channel* case (merits), the International Court of Justice sustained "every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States" (*I.C.J. Reports 1949*, p. 22).

1. The underlying principle

113. The most common expression of this proposition at this general level is the Latin maxim, *sic utere tuo ut alienum non laedas*.[213] The maxim has had application in one form or another at the purely municipal, at the federal (inter-provincial)[214] and international levels.[215] In precise terms the maxim has, at the inter-provincial and national levels, chiefly been applied by common law courts.[216] At the international level, implicit ap-

[213] In the Helsinki Rules, this maxim underlies chap. 3, "Pollution". See especially the commentary under art. X (ILA, *Report of the Fifty-second Conference . . .*, pp. 497–501, and works there cited). The Helsinki Rules contain no separate general article on responsibility for appreciable harm. In para. 3 of the preamble to its resolution of 1957, adopted in Buenos Aires, the Inter-American Bar Association asserted: "States having under their jurisdiction part of a system of international waters are under a duty to refrain from making changes in the existing regime that might affect adversely the advantageous use by one or more other States having a part of the system under their jurisdiction . . ." (Inter-American Bar Association, *Proceedings of the Tenth Conference . . . (op. cit.)*, p. 82). (The text of the resolution is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 208, document A/5409, para. 1092.)

[214] Relevant interstate practice has been partially reviewed in sect. B above, on equitable participation. For more detailed studies, see W. Van Alstyne, "International law and interstate river disputes", *California Law Review* (Berkeley, Calif.), vol. XLVIII, 1960, p. 596; J. Friedrich, "The settlement of disputes between States concerning rights to the waters of interstate streams", *Iowa Law Review* (Iowa City), vol. 32, 1946–1947, p. 244; Berber, *Rivers in International Law, op. cit.*, pp. 179–184; D. Schindler, "The administration of justice in the Swiss Federal Court in intercantonal disputes", *The American Journal of International Law*, vol. 15, 1921, p. 155. On the applicability of such precedent at the international level, see e.g. "Convenzione con la Francia per l'utilizzazione delle acque del fiume Roja e suoi affluenti", annotated by D. Anzilotti, *Rivista di Diritto Internazionale* (Rome), series II, vol. IV, 1915; M. Huber, "Ein Beitrag zur Lehre von der Gebietshoheit an Grenzflüssen", *Zeitschrift für Völkerrecht und Bundesstaatsrecht* (Breslau), vol. 1, 1907, pp. 34–35; W. B. Cowles, "International law as applied between subdivisions of federations", *Recueil des cours . . ., 1949–I* (Paris, Sirey 1949), vol. 74, pp. 659–670; Centro de Economía, Legislación y Administración del Agua, *Seminario de administración de cuencas interjurisdiccionales* (Mendoza, Argentina, 7–12 July 1975) (Mendoza, Instituto Nacional de Ciencia y Técnica Hídricas, 1975).

[215] Besides the *sic utere tuo* formulation, there are several other variations or similar maxims: *prohibetur ne quis faciat in suo quod nocere possit alieno* ("it is forbidden for any one to do or make on his own [land] what may injure another's") and *sic enim debere quem meliorem agrum suum facere ne vicini deteriorem faciat* ("everyone ought so to improve his land as not to injure his neighbour's")—said to be a "rule of the Roman law" (*Black's Law Dictionary*, 5th ed. (St. Paul, Minn., West Publishing Co., 1979), pp. 1091 and 1237–1238). E. C. Clark, in his *History of Roman Private Law* (Cambridge, University Press, 1914, part 2, vol. 2, p. 587), insists that "*sic utere tuo ut non laedas alienum*" was the original phrasing, i.e. that of a medieval hexameter, and finds that it was one of only two restrictions on private property rights, the other being eminent domain.

[216] For judicial discussion, application and criticism, see, *inter alia*,

Rylands and Horrocks v. *Fletcher* (1868) (United Kingdom, *The Law Reports, English and Irish Appeals*, vol. III, 1868, p. 330);

Thurston v. *Hancock et al.* (1815) (*Massachusetts Reports*, vol. 12, 1820, p. 224);

Fleming v. *Lockwood* (1908) (*Pacific Reporter*, vol. 92, 1908, p. 962), where the Montana Supreme Court ruled:

"The maxim '*sic utere tuo . . .*' furnishes, in a general sense, the rule by which every member of society posesses and enjoys his property, but it is not an ironclad rule, without limitations. If applied literally in every case it would largely defeat the very purpose of its existence, for in many instances it would deprive individuals of the legitimate use of their property . . . The doctrine of the maxim is not inconsistent with the rule of law that a man may use his property as he pleases, for all purposes for which it is

plication of the principle embodied in the maxim can be found in numerous treaties, for example in the arrangements between Canada and the United States, including but not limited to the 1972 and 1978 Agreements on Great Lakes water quality and implementation of the anti-pollution provision (art. IV) of their basic 1909 Boundary Waters Treaty in spite of other provisions of that Treaty.[217] A restatement of the principle can also be found in principle 21 of the United Nations Declaration on the Human Environment (Stockholm Declaration), proclaiming that 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."[218] Similarly, the report of the Intergovernmental Working Group of Experts on Natural Resources Shared by Two or More States, convened under UNEP auspices, contains draft principles of conduct in the field of the environment that implicitly assume the applicability of the principle to the subject matter:

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and 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.[219]

114. The *sic utere tuo* principle is clearly reflected, in addition, in article 3 of the Charter of Economic Rights and Duties of States, as adopted by the United Nations General Assembly in its resolution 3281 (XXIX) of 12 December 1974:

> In the exploitation of natural resources shares by two or more countries, each State must co-operate on the basis of a system of information and prior consultations in order to achieve optimum use of such resources without causing damage to the legitimate interest of others.

115. In the field of broadcasting, where various kinds of transmissions can cause interference in the territory of other States, the principle has wide acceptance, for example in the early international agreements such as the International Radiotelegraph Convention of 1927,[220] the International Telecommunication Convention of 1932,[221] and the International Convention on the Use of Broadcasting in the Cause of Peace of 1936.[222]

116. It has been maintained that the maxim in question had its origin in the Roman law;[223] however, regardless of origin it now occupies a firm place among

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adaptable, without being answerable for the consequences, if he is not an active agent in causing injury, if he does not create a nuisance, and if he exercises due care and caution to prevent injury to others";

Davoren v. *Kansas City* (1925) (*South Western Reporter*, vol. 273, 1925, p. 401), where the Missouri Supreme Court's ruling included the words: ". . . as it is sometimes stated, as not unreasonably to injure others";

Town of Jackson v. *Mounger Motors* (1957) (*Southern Reporter*, vol. 98, 1958, p. 698), where the Louisiana Court of Appeal ruled: "This principle is of course a qualification of the general rule that . . . the proprietor of land may do whatsoever he wishes with or on it, providing such use does not unreasonably disturb or curtail his neighbour's use of the latter's own property";

Chapman v. *Barnett* (1961) (*Indiana Appellate Court Reports*, vol. 131, 1962, p. 30);

Barger v. *Barringer* (1909) (*North Carolina Reports*, vol. 151, 1918 (reprint), p. 419);

Lasala et al. v. *Holbrook* (1833) (*Paige's Reports*, vol. 4, 1834, pp. 171–173);

the *Auburn and Cato Plank Road Co.* v. *Douglas* (1853) (*New York Reports*, vol. V, 1857, p. 444);

Mahan v. *Brown* (1835) (*Wendell's Reports*, vol. 13, 1836, p. 264).

See also W. Blackstone, *Commentaries on the Laws of England* (New York, Garland, 1978 (reprint)), vol. I, p. 306, and, for inferred general rules and excerpts from numerous additional cases, *American Jurisprudence*, 1st ed., vol. 38 ("Negligence", sect. 15); *ibid.*, 2nd ed., vol. 1, 1962, sect. 2, "Adjoining landowners", pp. 692–693, and vol. 16 A, 1979, sect. 367, "Constitutional law"; H. T. Tiffany, *A Treatise on the Modern Law of Property and other Interests in Land*, C. Zollmann, ed. (Chicago, Ill., Callaghan, 1940), especially sects. 508 and 509.

[217] See Cohen, *loc. cit.*, pp. 107 *et seq.*

[218] *Report of the United Nations Conference on the Human Environment, Stockholm, 5–16 June 1972* (United Nations publication, Sales No. E.73.II.A.14). See L. Sohn, "The Stockholm Declaration on the Human Environment", *Harvard International Law Journal* (Cambridge, Mass.), vol. 14, 1973, p. 423.

[219] Principle 3, para. 1 (UNEP/IG.12/2, annexed to UNEP/GC.6/17). Although in the explanatory note to the Principles the Group took the position that the formulation did not "intend to express an opinion as to whether or to what extent and in what manner the principles—as far as they do not reflect existing rules of general international law—should be incorporated in the body of general international law", the quoted language, by its terms, would seem to be declaratory of existing international law.

[220] Art. 10, sect. 2 (League of Nations, *Treaty Series*, vol. LXXXIV, p. 97).

[221] Art. 35, sect. 1 (*ibid.*, vol. CLI, p. 5).

[222] Art. I (*ibid.*, vol. CLXXXVI, p. 301).

[223] From what we know of the "Twelve Tables", table VIII contained a law VIII, which has some bearing on the point: "When rain falls upon the land of one person in such a quantity as to cause water to rise and injure the property of another, the Praetor shall appoint three arbiters for the purpose of containing the water, and providing against damage to the other party" (*The Civil Law*, S. P. Scott trans., ed. (Cincinnati, Ohio, Central Trust Co., 1932), vol. 1, p. 72). Number LXXI of the New Constitutions of Emperor Leo dealt with the question how close to the crops of another one may build structures upon tillable land or vineyards (*ibid.*, vol. 17, pp. 267–268). See also the Justinian Digest, book XXXIX, title III, concerning the right to compel a neighbour to take care of water and rain water (*ibid.*, vol. 9, pp. 3–17), and the Justinian Code, book III, title XXXIV, concerning servitudes and water, etc. (*ibid.*, vol. 12, pp. 323–326). In the Digest, book VII, title III, section 17, citing Papirius Justus, on Constitutions, book I, it is related that a rescript of the emperors Antoninus and Verus stated that "where water is taken from a public river for the purpose of irrigating fields, it should be divided in proportion to the size of the same, unless someone can prove that, by virtue of a special privilege, he is entitled to more", and that "a party should only be permitted to conduct water where this can be done without injury to another" (*ibid.*, vol. 3, p. 295). As is well known, the ancient maxims and rulings were often contradictory, as well as overlapping. Compare *neminem laedit qui jure suo uritur* (he who stands on his own rights injures no one) with *nemo damnum facit nisi qui id fecit quod facere jus non habet* (no one is considered as doing damage unless he is doing what he has no right to do). In a well documented, specialized study of the ancient origins of water law, Scott concludes:

> "Roman law . . . respected ancient rights and customs. It also concerned itself with practical needs. In dealing with one water case, Ulpian says (D.43.13.1.7) 'we ought to look at the usefulness of things and the safety of him who does the work, provided that those who dwell along the river are not injured'. Finally, Roman jurists followed the maxim 'equity suggests this, although we may be deficient in the law' in water problems; though the rules of the law might not provide relief, the jurist felt that it should be possible to act to protect a man who was benefiting himself and not harming others (D.39.3.2.5). The creation of a system of water law which protected ancient rights, adjusted to practical needs, and was informed by the principle of equity, was no small achievement." See also B. E. Dobkins, *The Spanish Element in Texas Water Law* (Austin, Texas University Press, 1959), p. 57; K. Neumeyer, "Ein Beitrag zum internationalen Wasserrecht", *Festschrift für George Cohn* (Zurich, Staatswissenschaftliche Fakultät, 1915), p. 143; C. G. Vernesco, *Des fleuves en droit international* (Paris, Rousseau, 1888), pp. iv–xvi, 1–42, 83–99, 123–146 (first part: "De la condition des fleuves en droit romain"), also pp. 144–150, 155–165, 172–193, 280–286.

the doctrinal bases for the obligation of States to avoid appreciable harm to other States, perhaps even more particularly with respect to harm transmitted via international watercourses. Numerous publicists have inferred the principle from State practice.[224]

117. One author concluded that there was one important qualification on the absolute independence of States, to wit:

> . . . the principle, corresponding possibly to the municipal law prohibition of "abuse of rights", that a State should not permit the use of its territory for purposes injurious to the interests of other States.[225]

The "connection" with "abuse of rights" is not unusual, at least by treatise writers grounded in the common law.[226] The civil law jurist, on the other hand, is most likely to address himself to the "abus de droit" principle.[227] If the principle, as couched, has in the past stirred disputation among jurists and judges,[228] at least at the international level its repeated espousal, in one formulation or another, can rightly be said, as with *sic utere tuo*, to constitute a general principle recognized as binding upon all members of the international community.[229] In this report, then, attention will be focused on refinement of the principle as it functions within the law of the non-navigational uses of international watercourse systems.[230] The principle is, in addition, registered in express terms in the general provisions of the Convention on the Law of the Sea:

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[224] See, *inter alia*, Smith, *op. cit.*, p. 71; Lederle, *Das Recht der internationalen Gewässer . . ., op. cit.*, p. 60; C. Eagleton, "The use of the waters of international rivers", *Canadian Bar Review* (Ottawa), vol. XXXIII, No. 8, 1955, p. 1023; Johnson, "Effect of existing uses on equitable apportionment of international rivers: an American view", *University of British Columbia Law Review* (Vancouver), vol. 1, 1959, p. 392; J. E. Manner, "Water pollution in international law" (WHO, *Aspects of Water Pollution Control*, Public Health Papers No. 13 (Geneva, 1962), p. 68); Van Alstyne, "The justiciability of international river disputes: a study in the case method", *Duke Law Journal* (Durham, N.C.), 1964, p. 316; Gönnenwein, *op. cit.*, p. 65; F. von der Heydte, *Völkerrecht* (Cologne, Verlag für Politik und Wirtschaft), 1958, vol. I, p. 241.

[225] J. G. Starke, *An Introduction to International Law*, 5th ed. (London, Butterworths, 1963), p. 101, under the rubric "Rules of neighbourly intercourse between States". See also Oppenheim, *op. cit.*, pp. 345–346 and 474–476, and works there cited; A. E. Utton, "International water quality law", *Natural Resources Journal*, vol. 13, 1973, pp. 286–294. Additional illustrations of State practice and doctrine will be utilized in the development of the elements of the topic.

[226] See A. Lester, "River pollution in international law", *The American Journal of International Law*, vol. 57, 1963. Lester concluded:

> "It can be stated confidently, *de lege lata*, that the Harmon doctrine is not a generally recognized principle of international law, and that there is liability for action incompatible with the general principle *sic utere tuo*. The doctrines of neighborship, abuse of rights, servitudes, and equitable apportionment stress elements which should be taken into account in the elaboration of river law, but they themselves do not provide specific legal norms" (*ibid.*, p. 847);

for precedents and works cited in support of the conclusion, *ibid.*, pp. 831–847.

[227] See its employment and discussion, in connection with the related (if not overlapping) principles, in *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, as follows: report by J. J. A. Salmon, "La pollution des fleuves et des lacs et le droit international" (pp. 193 *et seq.*, especially pp. 201–203) and works there cited, and the observations in response to para. 3 of J. J. A. Salmon's questionnaire (p. 294) of C.-A. Colliard (p. 296), R. Y. Jennings (pp. 298–299), E. McWhinney (p. 303), C. Rousseau (p. 304), I. Seidl-Hohenveldern (pp. 305–306), J. Sette Câmara (p. 308), H. Valladão (p. 310), J. H. W. Verzijl (p. 311), K. Zemanek (p. 313) and J. Zourek (p. 315) as well as of E. McWhinney (p. 366) and J. Zourek (p. 378). See also the fourth preambular paragraph of resolution II adopted by the Institute at its Athens session: "*Recalling* the obligation to respect the sovereignty of every State over its territory, as a result of which each State has the obligation to avoid any use of its own territory that causes injury in the territory of another State" (*ibid.*, Part Two, p. 197), and the discussion endorsing the principle set out in that paragraph (*ibid.*, pp. 107–108).

[228] An excursion into the substance and semantics of this venerable debate is not required. However, the basic positions can be consulted in e.g. H. Gutteridge, "Abuse of right", *The Cambridge Law Journal*, vol. V, 1933, p. 22; A. de Cupis, *Il danno, teoria generale della responsabilitá civile* (Milan, Giuffrè, 1955), pp. 20–21, and works there cited; A. Spota, *Tratado de derecho civil* (Buenos Aires, Depalma, 1947), t. 1, vol. 1, pp. 304–305, and t. 2, vol. 1, pp. 3–13; M. Rotondi, "L'abuso di diritto", *Rivista di diritto civile* (Padua), 1923, pp. 113–114; E. Salas Acdeel, "Las relaciones de vecindad y el abuso del derecho", *Jurisprudencia argentina* (Buenos Aires), vol. 71, p. 678; M. Markovitch, *La théorie de l'abus des droits en droit comparé* (Paris, Librairie générale de droit et de jurisprudence, 1936); R. Mugaburu, *Esquemas sobre la sistemática del derecho* (Buenos Aires, 1952), pp. 272–312 and 393–399, and works there cited); H. Capitant, "Des obligations de voisinage et spécialement de l'obligation qui pèse sur le propriétaire de ne causer aucun dommage au voisin", *Revue critique de législation et de jurisprudence* (Paris), vol. XXIX (1900), p. 156.

See "aemulatio" (abuse or misuse of right) in A. Berger, *Encyclopedic Dictionary of Roman Law* (Philadelphia, Pa., 1953), where it is maintained that the term is not of Roman origin but was developed in the Middle Ages when Justinian's laws came under the influence of Christian ethics; de Villiers, "Nuisances in Roman law", *The Law Quarterly Review* (London), vol. 13, 1897, p. 387; *A Provincial Manual of Later Roman Law, the Calabrian Procheiron on Servitudes and Bye-Laws incidental to the Tenure of Real Property*, E. H. Freshfield, (Cambridge, University Press, 1931). Contention among the Civil Code specialists centred on the logic of the existence of a right that could not be exercised to the full; analytically, it was argued, the initial statement of the right was inaccurate or incomplete in that restrictions or limitations would, strictly speaking, be part of any full description of the right. See in that connection M. Planiol, "Fondement de la responsabilité". *Revue critique de législation et de jurisprudence* (Paris), 1905, especially p. 290, and *ibid.*, 1906, p. 80, and by the same author, *Traité élémentaire de droit civil*, 9th ed., vol. II (Paris, Librairie générale de droit et de jurisprudence, 1923), pp. 287–292; G. Morin, "Quelques observations critiques sur le concept d'abus du droit", *Introduction à l'étude du droit comparé* (Paris, Sirey, 1938), vol. II, third part, p. 467. Provisions in civil codes concerning abuse of rights are surveyed in Berber, *Rivers in International Law, op. cit.*, pp. 198–205.

[229] See especially Kiss, *op. cit*; N.-S. Politis, "Le problème des limitations de la souveraineté et la théorie de l'abus des droits dans les rapports internationaux", *Recueil des cours . . . 1925–I* (Paris, Hachette), vol. 6, 1926, p. 5, and works there cited; Lauterpacht, *The Function of Law in the International Community* (Oxford, Clarendon Press, 1933), chap. 14; M. Scerni, *L'abuso di diritto nei rapporti internazionali* (Rome, Anonima romana editoriale, 1930); Cheng, *op. cit.*, chap. 4; S. Trifu, *La notion de l'abus de droit dans le droit international* (Paris, Domat Montchrestien, 1940); A. Hauriou, "Les dommages indirects dans les arbitrages internationaux", *Revue générale de droit international public* (Paris), 2nd series, vol. VI, 1924, p. 203; I. C. MacGibbon, "Customary international law and acquiescence", *The British Year Book of International Law, 1957*, vol. 33, p. 115; Schwarzenberger, "Uses and abuses of the abuse of rights in international law", The Grotius Society, *Transactions for the Year 1956* (London), 1957, vol. 42, p. 147; J.-D. Roulet, *Le caractère artificiel de la théorie de l'abus de droit en droit international public* (Neuchâtel, Editions de la Baconnière, 1958); Sauser-Hall, *loc. cit.*, p. 5, and works there cited; E. R. C. van Bogaert, *Het rechtsmisbruik in het volkenrecht* (Antwerp, De Sikkel, 1948); H.-J. Schlochauer, "Die Theorie des *abus de droit* im Völkerrecht", *Zeitschrift für Völkerrecht* (Breslau), vol. XVII, No. 3, 1933; W. Friedmann, "The uses of 'general principles' in the development of international law", *The American Journal of International Law*, vol. 57, 1963, especially pp. 288–290; L. Siorat, *Le problème des lacunes en droit international* (Paris, Librairie générale de droit et de jurisprudence, 1958), p. 395; Bourne, "The right to utilize the waters of international rivers", *The Canadian Yearbook of International Law, 1965* (Vancouver), vol. III, 1965, p. 187; G. Dahm, *Völkerrecht* (Stuttgart, Kohlhammer, 1958), vol. I, pp. 541–542.

[230] Consideration of the consequences of the principle has been eschewed, since that subject belongs more properly to the field of State responsibility, a topic under extended and active consideration by the Commission.

Article 300. Good faith and abuse of rights

The States parties to this Convention undertake to discharge in good faith the obligations entered into in conformity with this Convention, and to exercise the rights, jurisdictions and freedoms recognized in this Convention in a manner which would not constitute an abuse of right.[231]

118. There is one more related principle that merits at least some exposition at this point: the principle of "good-neighbourship" ("voisinage"). Conceptualized in that manner, the limitation upon the complete freedom of action of the State seems to have been taken up chiefly on the European continent, and the position is seen as "very similar to that in connection with the principle of the abuse of rights . . ."[232] There is a considerable literature which examines the proposition.[233] The principle has been stated authoritatively in, for example, the German Civil Code of 1884:

. . . that a person's right to dispose of his property is limited by the similar right of disposal possessed by the neighbour, and the latter is not compelled to put up with installations having a detrimental effect to his land which exceed the proportions arising from the normal social relations of daily life.[234]

While the related principles of *sic utere tuo* and "abus de droit" stress the restrictive aspect of the property owner's use rights, and good-neighbourship doctrine makes plain that the neighbour is also under duty to tolerate inconsequential or minor "interferences".[235] Interferences are not lawful where they could have, with due consideration, been avoided.[236] And some authorities regard the principle as limited "to the requirement that States shall not, in areas adjacent to an international boundary, engage in activities that may have injurious consequences for a neighbouring country".[237] Although in earlier times, and even often today, the restriction to border regions may have sufficed, the general principle underlying responsibility for appreciable harm today is not so limited.

119. This general proposition, lacking in precise definition certainly, is also reflected in other legal systems and apparently is of truly ancient origin. The earliest known code of laws, the Code of Hammurabbi, contains many provisions concerning irrigation. From these provisions it appears that each farmer along an irrigation canal was obligated not to use the water in such a way as to damage his neighbours' lands.[238] The principle of Islamic law to the effect that one must not harm the property of another in a way that one would not have his own damaged has a counterpart in Jewish law: "a landowner in using his land was under a duty not to harm his neighbour and not to deprive him of his customary rights by committing nuisances and so forth".[239]

120. Admittedly a balancing of interests is called for, as was reported in the *Spanish Zone of Morocco* case:

It is admitted that all law has the object of assuring the co-existence of interests worthy of legal protection. This is undoubtedly also true of international law . . .[240]

Indeed, the tribunal found several principles "not even open to discussion", the first one of which was stated as follows:

Responsibility is the necessary corollary of right. All rights of an international character consequently involve international responsibility . . .[241]

121. A well-known decision by the Staatsgerichtshof (Constitutional Law Court) of Germany went even further in applying the rule as between federal States, but involving rights in the flow of the waters of the Danube. In holding that Baden must desist from injuring its neighbour at Immendingen Dam, the Court relied on the "generally recognized principles of water law . . . [to the effect that] no useless consumption of water, injurious to other interested parties, may be connected with a dam" and that, while a State "is not obliged to interfere, in the interests of another State, with the natural processes affecting an international river", Baden's actions amounted to "the neglect of any orderly work of maintenance" along this part of the river. Further, that "only considerable interference with the natural flow of international rivers can form the basis for claims under international law"; however, "legal principles which have been developed for the common utilization of international watercourses flowing above ground require . . . application to water flowing underground", and therefore Würtemberg was under a duty "to refrain from such interference with the natural distribution of water as damages the interests of Baden to any considerable extent".[242]

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[231] *Official Records of the Third United Nations Conference on the Law of the Sea*, vol. XVII, document A/Conf. 62/122.

[232] Berber, *Rivers in International Law (op. cit.)*, p. 211.

[233] See *inter alia* von der Heydte, "Das Prinzip der guten Nachbarschaft . . .", *loc. cit.*, pp. 133–145; H. Thalmann, *Grundprinzipien des modernen zwischenstaatlichen Nachbarrechts* (Zurich, Juris-Verlag, 1951); Andrassy, "Les relations internationales de voisinage", *loc. cit.*, p. 77; Capitant, "Des obligations de voisinage et spécialement de l'obligation qui pèse sur le propriétaire de ne causer aucun dommage au voisin", *loc. cit.*; R. von Jhering, "Des restrictions imposées aux propriétaires fonciers dans l'intérêt des voisins", *Oeuvres choisies*, O. de Meulenaere, trans. (Paris, Marescq, 1893), vol. 2, p. 101; H. de Page, *Traité élémentaire de droit civil bélge*, (Brussels, Bruylant, 1938), vol. 4, p. 801; L. Barassi, *La proprietà nel nuovo Codice civile*, 2nd rev. (Milan, Giuffrè, 1943), p. 300; Ch. de Visscher, *Problèmes de confins en droit international public* (Paris, Pedone, 1969).

[234] *Entscheidungen des Reichsgerichts in Zivilsachen* (Leipzig, Verlag von Weit, 1884), vol. 11, p. 345, as quoted in Berber, *Rivers in International Law, op. cit.*, p. 215. The Civil Code (sect. 903) provides, however: "A person may deal at will with his property in so far as he does not come into conflict with the law or the rights of a third person" (quoted in Berber).

[235] It should not escape mention that the first-mentioned "end" recited in the Preamble to the Charter of the United Nations is "to practise tolerance and live together in peace with one another as good neighbours".

[236] Entscheidungen des Reichsgerichts in Zivilsachen (Berlin, de Gruyter, 1939), vol. 159, p. 139. Note, too, "the responsibility which today devolves upon all countries, great and small, to establish an atmosphere of co-operation and security throughout the world, and . . . the role that the existence and development of bilateral good neighbourly relations and understanding among States can play in achieving that goal" (General Assembly resolution 2129 (XX) of 21 December 1965).

[237] Barberis, *Los recursos . . ., op. cit.*, p. 149. But see G. Handl, "Territorial sovereignty and the problem of transnational pollution", *American Journal of International Law*, vol. 69, 1975, especially p. 56.

[238] *The Babylonian Laws*, G. R. Driver and J. C. Miles eds., 2nd edition (Oxford, Clarendon Press, 1956), vol. 1, p. 153.

[239] G. Horowitz, *The Spirit of Jewish Law: a Brief Account of Biblical and Rabbinical Jurisprudence* (New York, Central Book Co., 1953), p. 328. See also M. Fathi, *La doctrine musulmane de l'abus des droits* (Lyon University, Séminaire oriental d'études juridiques et sociales, 1913); FAO, *Water Laws in Moslem Countries*, Irrigation and Drainage Paper 20/1, by D. Caponera (Rome, 1973), vol. I, especially pp. 21–22 and 38–42, and works there cited.

[240] British claims in the Spanish zone of Morocco, *Spain* v. *United Kingdom* (1925) (United Nations, *Reports of International Arbitral Awards*, vol. II . . ., p. 640).

[241] *Ibid.*, p. 641.

[242] *Würtemberg and Prussia* v. *Baden* (the Donauversinkung case)

(*Continued on next page.*)

122. The Additional Act to the 1866 Treaty of Bayonne, which was central to the judgment in the *Lake Lanoux* arbitration between France and Spain, contains a provision, article 9, with respect to requirements concerning existing uses. The Tribunal said in that connection:

> The recognition of the legality of such use is subject to the following conditions:
>
> . . .
>
> (*b*) The legality of each enjoyment is recognized only to the extent that the water used is necessary to satisfy actual needs.
>
> (*c*) The recognition of the legality of an enjoyment is to cease in case of abuses, including abuses other than employment of water in excess of what is necessary to satisfy actual needs.[243]

Among other more recent treaty practice, the 1963 Act regarding navigation and economic co-operation between the States of the Niger Basin provided for utilization of the river, its tributaries and subtributaries by the parties consistent with their duty not to engage in activities injurious to other treaty partners.[244] The 1971 Convention between Ecuador and Peru, covering two basins, Puyango–Tumbes and Catamayo–Chira, recognizes the right of each country to use the waters in its territory for its needs, "provided that it causes no damage or injury to the other party".[245]

The 1972 Convention on the status of the River Senegal required, in article 4, consultations and approval by the contracting parties on any project susceptible of modifying the characteristics of the river's regime, etc., "d'une manière sensible"; the joint agency provided for in article 11 of the Convention would be competent to evaluate whether the modification was "sensible".[246]

123. The 1964 Convention and Statute for the Chad Basin requires notification to the Lake Chad Basin Commission of all projects under study; the Commission must be consulted concerning all measures that might produce an "influence sensible" on: water losses, the annual hydrograph, the conditions of use by the other riparian States, water quality and the biological characteristics of the flora and fauna.[247] Acting under the Treaty of Brasilia of 1969, covering the Plata Basin, the Foreign Ministers of the five system States adopted in 1971 the Act of Asunción on the use of international rivers, which requires that, with respect to successive rivers, each basin State may utilize the waters for its needs, "provided that it causes no appreciable damage to any other State of the basin".[248]

124. The 1975 Statute for the Uruguay River, adopted by Uruguay and Argentina, provides that the parties

> undertake to adopt the necessary measures to ensure that the management of land and forests and the use of groundwater and of the river's tributaries do not effect an alteration such as to cause appreciable harm to the regime of the river or the quality of its waters.[249]

The parties are also to submit to the Administrative Commission, created under chapter XIII of the Statute, every six months,

> a detailed report on all development activities undertaken or authorized by them in the areas of the river under their respective jurisdictions, in order that the Commission may determine whether, in the aggregate, such activities are causing appreciable harm.[250]

125. By a tripartite declaration in 1960, Argentina, Brazil and Uruguay agreed *inter alia*, with respect to the Salto Grande works, that Brazil had a right to indemnization for the damages that might be caused by the flooding of its territory by the reservoir behind the dam; moreover, Brazil's right to be heard, should the two parties decide to modify the approved plans, for example to raise the height of the dam, was acknowledged, and Brazil was to consult in advance with the other two Governments about any works it might plan in its portion of the Uruguay River that might injure the latter.[251] In the 1944 Treaty between Mexico and the United States of America, each party declares its intention to operate its facilities in such manner, consistent with the normal operations of its hydraulic systems, so as not to harm the other.[252] The 1977 Agreement on the Kagera Basin defines a project as inter-State and subject to the approval of the basin organization when, *inter alia*, it could produce "substantial effects", beneficial or prejudicial, in another signatory State.[253] The Indus Waters Treaty (Pakistan–India, 1960) provides:

> If either party plans to construct any engineering works which would cause interference with the waters of any of the rivers and which, in its opinion, would affect the other party materially, it shall notify the other party of its plans and shall supply such data relating to the work as may be available as would enable the other party to inform itself of the nature, magnitude and effect of the work . . .[254]

(*Footnote 242 continued.*)

(1927) (*Entscheidungen des Reichsgerichts (op. cit.)*, vol. 116, pp. 1, 22, 30 and 31–42, quoted in Hackworth, *op. cit.*, vol. 1, pp. 597–599).

[243] *International Law Reports, 1957*, p. 122. "It could have been argued that the works would bring about an ultimate pollution of the waters of the Carol or that the returned waters would have a chemical composition or a temperature or some other characteristic which would injure Spanish interests. Spain could then have claimed that her rights had been impaired in violation of the Additional Act . . . It has not been clearly affirmed that the proposed works would entail an abnormal risk in neighbourly relations or in the utilization of the waters" (*ibid.*, p. 123).

[244] United Nations, *Treaty Series*, vol. 587, p. 9.

[245] Ecuador, *Registro Oficial* (Quito), 2nd year, No. 385, 4 Jan. 1972, p. 1.

[246] The text of the Convention is reproduced in "Economic co-operation among developing countries: compilation of the principal legal instruments" (TD/B/609/Add.1 (vol. IV)), p. 11).

[247] See footnote 139 above.

[248] Resolution No. 25, para. 2. See *Yearbook . . . 1974*, vol. II (Part Two), p. 324, document A/CN.4/274, para. 326.

[249] Art. 35 (chap. IX: "Conservation, utilization and exploitation of other natural resources") (*Actos internacionales Uruguay-Argentina 1830–1980* (Montevideo, 1981), p. 600); art. 36: " The parties shall, through the Commission, co-ordinate appropriate measures to prevent alteration of the ecological balance, and to control impurities and other harmful elements in the river and its catchment area".

[250] Art. 28 (*ibid.*, p. 599).

[251] Hayton, "The Plata Basin", *The Law of International Drainage Basins (op. cit.)*, p. 379.

[252] Art. 17 (United Nations, *Treaty Series*, vol. 3, p. 350). See also Meyers, *loc. cit.*, pp. 567–568.

[253] Art. 2, para. 2, of the Agreement for the establishment of the Organization for the Management and Development of the Kagera River Basin (Burundi, Rwanda, United Republic of Tanzania), 24 August 1977.

[254] Art. VII, para. 2 (United Nations, *Treaty Series*, vol. 419, p. 146). The paragraph provides further that, if a work causes interference, but not materially, in the opinion of the party that plans its construction, that party will nonetheless supply to the other party at its request the available information on the nature, magnitude and effect of the work. See also Baxter, *loc. cit.*, p. 471. Among numerous other examples, see the 1968 Agreement between Bulgaria and Turkey concerning co-operation in the use of the waters of rivers flowing through the territory of both countries, art. 2 of which provides that ". . . they shall avoid causing any substantial damage to each other in the construction and use of installations on rivers flowing through their territory" (United Nations, *Treaty Series*, vol.

126. As early as 1911, at its Madrid session, the Institute of International Law concluded, in its "Reglementation internationale des cours d'eau internationaux", that:

When a stream forms the frontier of two States, neither of these States may, without the consent of the other, and without special and valid legal title, make or allow individuals, corporations, etc., to make alterations therein detrimental to the bank of the other State. On the other hand, neither State may, on its own territory, utilize or allow the utilization of the water in such a way as seriously to interfere with its utilization by the other State or by individuals, corporations, etc., thereof.[255]

The regulations further stated, in rule II, paragraph 3, with respect to successive streams:

No establishment . . . may take so much water that the constitution, otherwise called the utilizable or essential character, of the stream shall, when it reaches the territory downstream, be seriously modified . . .[256]

127. The American States, at their Seventh International Conference, held in Montevideo in 1933, approved a Declaration which stated *inter alia*:

. . . no State may, without the consent of the other riparian State, introduce into watercourses of an international character, for the industrial or agricultural exploitation of their waters, any alteration which may prove injurious to the margin of the other interested State.[257]

128. By 1961, the Institute of International Law was ready with a broader pronouncement on utilization of non-maritime international waters (except for navigation), which came to be known as the "Salzburg resolution".[258] After establishing in article 2 that the right to utilize was "subject to the limits imposed by international law and, in particular, those resulting from the provisions [of the resolution] which follow", and postulating utilization "on the basis of equity" in article 3, the provision most relevant here, article 4, reads:

No State can undertake works or utilizations of the waters of a watercourse or hydrographic basin which seriously affect the possibility of utilization of the same waters by other States except on condition of assuring them the enjoyment of the advantages to which they are entitled under article 3, as well as adequate compensation for any loss or damage.

Recently, at its 1979 Athens session, the Institute adopted a resolution on the pollution of rivers and lakes and international law which states:

. . . States shall be under a duty to ensure that their activities or those conducted within their jurisdiction or under their control cause no pollution in the waters of international rivers and lakes beyond their boundaries.[259]

The International Law Association at its 1980 Belgrade Conference adopted two articles on "relationship between water, other natural resources and the environment", article 1 of which reads:

Consistent with article IV of the Helsinki Rules, States shall ensure that:

(*a*) The development and use of water resources within their jurisdiction do not cause substantial damage to the environment of other States or of areas beyond the limits of national jurisdiction; and

(*b*) The management of their natural resources (other than water) and other environmental elements located within their own boundaries does not cause substantial damage to the natural condition of the waters of other States.[260]

At the same Conference, the Association adopted nine articles on "regulation of the flow of water of international watercourses", defined as "continuing measures intended for controlling, moderating, increasing or otherwise modifying the flow of the waters in an international watercourse for any purpose; such measures may include storing, releasing and diverting of water by means such as dams, reservoirs, barrages and canals . . ." The pertinent provisions of these rules read as follows:

Article 6

A basin State shall not undertake regulation that will cause other basin States substantial injury unless those States are assured the enjoyment of the beneficial uses to which they are entitled under the principle of equitable utilization.

Article 7

1. A basin State is under a duty to give the notice and information and to follow the procedure set forth in article XXIX of the Helsinki Rules.

2. When appropriate, the basin State should invite other basin States concerned to participate in the regulation.

Article 8

In the event of objection to the proposed regulation, the States concerned shall use their best endeavours with a view to reaching an agreement. If they fail to reach an agreement within a reasonable time, the States should seek a solution in accordance with chapter 6 of the Helsinki Rules.[261]

807, p. 124); the 1971 Agreement between Finland and Sweden concerning frontier rivers (*ibid.*, vol. 825, p. 272), especially, chap. 3 ("Hydraulic construction works"), in which it is provided as follows:

"where the construction would result in a substantial deterioration in the living conditions of the population or cause a permanent change in natural conditions such as might entail substantially diminished comfort for people living in the vicinity or a significant nature conservancy loss or where significant public interests would be otherwise prejudiced, the construction shall be permitted only if it is of particular importance for the economy or for the locality or from some other public standpoint" (art. 3, second para.);

"Where hydraulic construction works . . . may have a harmful effect on fishing, the person carrying out the construction shall take or pay for such measures as are reasonably called for in order to protect the fish stock or maintain fishing of an equal standard" (art. 7);

"Persons carrying out construction works shall . . . be bound to take or pay for the measures required in order to prevent any significant inconvenience to timber floating . . ." (art. 8, second para.);

". . . care shall be taken to ensure that, apart from occasional, temporary turbidity, no pollution occurs that causes any significant inconvenience" (art. 9).

[255] *Annuaire de l'Institut de droit international, 1911*, vol. 24, pp. 365–366 (rule I). The text of the regulations is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 200, document A/5409, para. 1072.)

[256] *Ibid.* The same regulations went so far as to declare: "All alterations injurious to the water, the emptying therein of injurious matter . . . is forbidden" (rule II, para. 2).

[257] Para. 2, second para. (Pan American Union, *Seventh International Conference . . . (op. cit.)*, p. 114). (The Declaration is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 212, document A/5409, annex I, A.) Para. 3 declares: ". . . When damages capable of repair are concerned, the works may only be executed after adjustment of the incident regarding indemnity, reparation (or) compensation of the damages . . .".

[258] *Annuaire de l'Institut de droit international, 1961*, pp. 381–384. (The text of the resolution is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 202, document A/5409, para. 1076.)

[259] Art. II (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 199). The French text reads ". . . ne causent pas . . . de pollution . . ." (*ibid.*, p. 198).

[260] For the articles, with annotated comments, see ILA, *Report of the Fifty-ninth Conference . . .*, report of the Committee on International Water Resources Law, part II (Rapporteurs: G. Cano, J. Barberis and L. Teclaff).

[261] For the text of the articles, with introduction and commentary (Chairman: E. Manner), *ibid.*, pp. 367–369.

129. Previously, in 1972, the Association, also upon the recommendation of its Committee on International Water Resources Law, had approved special articles on marine pollution of continental origin, which covered, *inter alia*, the "discharge or introduction of substances . . . indirectly through rivers or other watercourses whether natural or artificial".[262] The relevant substantive article reads:

Taking into account all relevant factors referred to in article III, a State

(*a*) shall prevent any new form of continental seawater pollution or any increase in the degree of existing continental seawater pollution which would cause substantial injury in the territory of another State or to any of its rights under international law or to the marine environment, and

(*b*) shall take all reasonable measures to abate existing continental seawater pollution to such an extent that no substantial injury of the kind referred to in paragraph (*a*) is caused.[263]

For our purposes, two more articles in this ILA text merit quotation:

Article IV

When it is contended that the conduct of a State is not in accordance with its obligations under these articles, that State shall promptly enter into negotiations with the complainant with a view to reaching a solution that is equitable under the circumstances.

Article V

In the case of violation of the rules in article II, the State responsible shall cease the wrongful conduct and shall compensate the injured State for the injury that has been caused to it.[264]

2. The matter of "appreciable"

130. Although a few doctrinal statements and even treaties have expressed the principle in absolute terms,[265] that is, apparently proscribing activities of a system State that cause any harm whatsoever to another system State, the usual formulations are careful to contain a qualification. Harm of some significance is required before the legal interests of the affected State would be infringed. Also, thus far, most of the applications have dealt with pollution. The qualifying terms obviously vary, although it is not as readily ascertainable whether the same, or essentially the same, degree of harm is intended to be imparted. "Substantial", "significant", "sensible" (in French and Spanish) and "appreciable" (especially in French) are the adjectives most frequently employed to modify "harm".

131. These variations in terminology may in considerable part be the result of choices made by translators. For example, a leading student of the topic, whose native language is Spanish and who is an accomplished linguist, appears more or less to equate *perjuicio sensible*, the phrase he uses and defines as "injury of a certain importance", with "serious magnitude", "serious detriment" and "substantial", in English, with *erheblich beeinträchtigen* (to prejudice in a manner that is important, considerable, of consequence), *wesentlich benachteiligen* (to injure substantially, or in a real manner), or *wichtige Interessen . . . beeinträchtigen* (to injure important, weighty, serious interests), in German, and with *nuire gravement*, *sensiblement modifier*, *entraves sensibles*, *changement sensible* and *influence sensible*, in French.[266]

132. Examples from treaty practice include the Agreement of 26 February 1975 between Argentina and Uruguay,[267] the Act of Santiago of 26 June 1971 between Argentina and Chile,[268] and the Act of Asunción (Argentina, Bolivia, Brazil, Paraguay and Uruguay) of 3 June 1971,[269] all of which use *perjuicio sensible*; Brazil and Uruguay, on the other hand, agreed in 1933 on the use of *modificación sensible y durable*.[270] The 1879 Treaty between Baden and Switzerland refers to an *erhebliche Einwirkung* (considerable influence);[271] the 1891 Treaty between the United Kingdom and Italy deals with *ouvrage qui pourrait sensiblement modifier*;[272] the 1905 Treaty between Norway and Sweden speaks of *entraves sensibles*;[273] in 1931, Romania and Yugoslavia employed *changement sensible du régime des eaux*.[274] In the Belgium–United Kingdom Treaty of 1934, the word "substantial" appears,[275] while the more recent Treaty of 8 April 1960 between the Netherlands and the Federal Republic of Germany speaks of *Massnahmen . . . die den Nachbarstaat wesentlich benachteiligen* ("measures . . . causing substantial prejudice to the neighbouring State").[276] The tripartite agreement of 30

[262] Art. I (ILA, *Report of the Fifty-fifth Conference* . . . (p. xvii).

[263] Art. II (*ibid.*, pp. xvii–xviii). See also art. III, on "relevant factors" following a list of "international standards" that should be established "as soon as possible" (*ibid.*, p. xviii), which shows departures from as well as resemblances with the factors for equitable utilization set out in art. V of the Helsinki Rules.

[264] *Ibid.* For the discussion of the topic at the Conference and the relevant portion of the Committee's report, *ibid.*, pp. 26–37 and 97–106 respectively. For the articles on flood control, adopted at the same Conference, and the discussion and report, *ibid.*, pp. xvi–xvii, 22–26, 43–97.

[265] See e.g. para. 2 of the 1971 Argentine-Uruguayan Declaration on water resources: "States shall refrain from polluting international rivers and tributaries in any manner and shall conserve the ecological resources in the areas within their respective jurisdictions" (see *Yearbook . . . 1974*, vol. II (Part Two), p. 325, document A/CN.4/274, para. 328). Czechoslovakia and the USSR, in art. 14, para. 1, of their 1956 Agreement concerning the frontier, contracted to "ensure that the frontier waters are kept clean and are not artificially polluted or fouled in any way. They shall also take measures to prevent damage to the banks of the frontier river Uzh" (United Nations, *Treaty Series*, vol. 266, p. 312).

[266] Barberis, *Los recursos . . .*, *op. cit.*, p. 29.

[267] Arts. 7 and 11 (*Actos internacionales Uruguay-Argentina, 1830–1980* (Montevideo, 1981) pp. 594–596).

[268] Art. 4. (The text of the Act is reproduced in part in *Yearbook . . . 1974*, vol. II (Part Two), p. 324, document A/CN.4/274, para. 327).

[269] Resolution No. 25, para. 2 (*ibid.*, p. 324, para. 326).

[270] Art. XX (League of Nations, *Treaty Series*, vol. CLXXXI, p. 77).

[271] Art. 5 (G.Fr. de Martens, ed., *Nouveau Recueil général de Traités*, 2nd series, (Göttingen, Dieterich, 1884), vol. IX, p. 595.

[272] Art. III (*ibid.*, vol. XVIII, p. 738).

[273] Art. 2 (*ibid.*, vol. XXXIV, p. 711).

[274] Art. 3 (League of Nations, *Treaty Series*, vol. CXXXV, p. 31).

[275] Art. 1 (*ibid.*, vol. CXC, p. 103).

[276] Art. 58, para. 1 (United Nations, *Treaty Series*, vol. 508, p. 190). See also e.g. the 1973 Treaty of the Plata River and its maritime limits (Argentina-Uruguay), arts. 21 and 71 (*sensible* translated as "substantial" in *International Legal Materials*, vol. XIII, 1974, pp. 255 and 263); the 1891 Protocol of Rome between the United Kingdom and Italy (*sensiblement modifier*) (*British and Foreign State Papers, 1890–1891* (London, 1897), vol. LXXXIII, p. 21). On the other hand, avoidance of works entailing "any prejudice" to the interests of Egypt appeared in both the 1929 and the 1952–1953 exchanges of notes between the United Kingdom and Egypt (League of Nations, *Treaty Series*, vol. XCIII, p. 44, and United Nations, *Treaty Series*, vol. 207, p. 278). See the discussion and illustrations relating to the proper "quantity" term and the problem of precision in *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, "La pollution des fleuves et des lacs et le droit international", pp. 218, *et passim*.

April 1966b between Austria, the Federal Republic of Germany and Switzerland addresses itself to situations that *wichtige Interessen anderer Anliegerstaaten beeinträchtigen* ("adversely affect important interests of other riparian States").[277]

133. Among modern system-wide conventions, the pertinent language in the 1972 Convention on the status of the Senegal River was *projet susceptible de modifier d'une manière sensible*,[278] and the Lake Chad Basin Statute of 1964 refers to *mesures susceptibles d'exercer une influence sensible*.[279]

134. Thus, starting in the last century and persisting into very contemporary treaty practice, the States concerned have, while heeding the *sic utere tuo* maxim, almost always limited it by one of the terms discussed above.[280]

135. In the Helsinki Rules, "substantial" is employed in relation to pollution:

Article X

1. Consistent with the principle of equitable utilization of the water of an international drainage basin, a State

(*a*) must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause *substantial injury** in the territory of a co-basin State, and

(*b*) should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no *substantial damage** is caused in the territory of a co-basin State.[281]

The commentary to article X explains "substantial injury" in the following terms:

Pollution as that term is used in this chapter may be the result of reasonable and otherwise lawful use of the waters of an international basin. For example, the normal process of irrigation for the reclamation of arid or semi-arid land usually causes an increase in the salinity of the downstream waters. Modern industrial processes of a very valuable and useful nature may result in the discharge of deleterious wastes that pollute the water. Frequently rivers are the most efficient means of sewage disposal, thereby causing pollution of waters. Thus, as pollution may be a by-product of an otherwise beneficial use of the waters of an international drainage basin, the rule of international law stated in this article does not prohibit pollution *per se* ...

However, where the effect of the pollution is such that it is not consistent with the equitable utilization of the drainage basin and causes "substantial injury" in the territory of another State, the conduct causing the pollution gives rise to a duty, as stated in this article, on the part of the State responsible for the pollution.

Not every injury is substantial. Generally, an injury is considered "substantial" if it materially interferes with or prevents a reasonable use of the water. On the other hand, to be "substantial" an injury in the territory of a State need not be connected with that State's use of the waters. For example, the pollution of water could result in "substantial injury" in the territory of another State by the transmission . . . of organisms that cause disease.[282]

136. The 1969 draft European convention on the protection of fresh water against pollution, of the Council of Europe, expressly recognized in the preamble "that it is a general principle of international law that no country is entitled to exploit its natural resources in a way that may cause substantial damage in a neighbouring country".[283] Previously, in 1965, the Consultative Assembly had approved a list of "guiding principles on fresh water pollution control" that included, in the preamble, the declarative statement that control of water pollution "constitutes a fundamental governmental responsibility and requires systematic international collaboration".[284] This approved list of principles resulted from a report to the Consultative Assembly prepared by an inter-committee working group. A section of the report covered the legal basis for pollution control at the international level. The most pertinent paragraphs of that section, drafted 16 years ago, are still valid and read as follows:

Most specialists who have studied the problem of the responsibility of a State in regard to the damage caused outside its territory conclude that international law does not allow any State to use its waters in such a way as to cause substantial damage to a neighbouring country. Amongst the theories and principles most frequently quoted in support of this conclusion are the Roman law maxim *sic utere tuo ut alienum non laedas* (a principle which has been widely recognized in the parallel field of radio broadcasting . . .); the theory of the abuse of rights; and principle of neighbourship. Recently two other theories have been put forward: the "principle of coherence" according to which a drainage basin constitutes an indivisible unit from both the physical and the legal points of view, and the principle of peaceful coexistence.

. . .

. . . since 1860 . . . about forty conventions have been concluded in Europe with the direct or indirect aim of protecting international watercourses from pollution.

. . .

. . . it would clearly be dangerous to assert that there are in international law any precise and concrete rules as to the rights and obligations of States in regard to international water pollution. The most one can do is to note the existence of the principle that a State must not allow international water passing through its territory to be used without proper regard for the legitimate interests of neighbouring States.[285]

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[277] Art. 3, para. 1 (United Nations, *Treaty Series*, vol. 620, p. 200).

[278] Art. 4 (TD/B/609/Add.1 (vol. IV), p. 12).

[279] Art. 5 (*Journal officiel de la République fédérale du Cameroun* . . ., 4th year, No. 18, p. 1003). Art. II of the 1974 Stockholm Convention on the Protection of the Environment (Denmark, Finland, Norway, Sweden) deals with "the permissibility of environmentally harmful activities which entail or may entail *considerable nuisance** in another Contracting State" (*International Legal Materials*, vol. XIII, 1974, p. 595).

[280] See Jiménez de Aréchaga, "International law in the past third of a century", *Recueil des cours* . . ., *1978-I* (Aalphen aan den Rijn, Sijthoff and Noordhoff, 1979), vol. 159, pp. 194–195.

[281] ILA, *Report of the Fifty-second Conference* . . ., pp. 496–497. Para. 2 of art. X provides:

"The rule stated in paragraph 1 of this article applies to water pollution originating:

(*a*) within a territory of the State, or

(*b*) outside the territory of the State, if it is caused by the State's conduct."

[282] *Ibid.*, p. 500.

[283] Council of Europe, Consultative Assembly, recommendation 555 (1969) (doc. 2561), p. 3. (The text of the draft convention is reproduced in *Yearbook* . . . *1974*, vol. II (Part Two), pp. 344–345, document A/CN.4/274, para. 374.) Art. 2 of the draft gave operative form to the principle of "substantial" damage stated in its para. 1. The draft did not find favour with the Council's Committee of Ministers on several grounds, including the finding that it went beyond even the Helsinki Rules with respect to State responsibility. Because concerted action in the field of water pollution was judged indispensable, a new draft was "commissioned" to reflect the aims established by the Consultative Assembly in its recommendation 555. The resulting substitute draft (1974) (doc. 3417) was couched in terms more of affirmative and close co-operation; the earlier draft's attention to general international law was omitted, but the provisions concerning institutional arrangements, data and notice were strengthened (*ibid.*, pp. 346–349, para. 377).

[284] Council of Europe, Consultative Assembly, recommendation 436 (1965) (doc. 1965), para. 1(*c*). The problem of responsibility for "substantial injuries" is taken up in para. 11(*c*), under the heading "International aspects". (The text of the recommendation is reproduced in *Yearbook* . . . *1974*, vol. II (Part Two), pp. 341–342, document A/CN.4/274, para. 372.)

[285] Council of Europe, Consultative Assembly, report on fresh water pollution control in Europe (doc. 1965), pp. 95, 97, 98. (The

(*Continued on next page.*)

From this intensive preparatory work the notable European Water Charter developed. Approved by the Consultative Assembly and the Committee of Ministers in 1967, it was proclaimed in Strasbourg on 6 May 1968.[286] The matter of State responsibility is not taken up in so many words in the Charter, but the "international" character of this "indispensable" "treasure", that is, water, is roundly declared in article III, third para.: "Any *important** reduction of quantity and deterioration of quality of water, whether running or still, may do *harm** to man and other living creatures." Article XI provides that the management of water resources "should be based on their natural basins rather than on political and administrative boundaries" and that "all uses of surface and underground waters are interdependent and should be managed bearing in mind their interrelationships". Article XII states: "Water knows no frontiers; as a common resource it demands international co-operation."

137. While for some commentators distinguishing between the terms "serious", "substantial", *sensible*, etc. may turn on insubstantial differences, the Special Rapporteur has concluded that "appreciable" is the correct and preferred term. This choice has already met with at least tentative approval within the Commission. Article 3, paragraph 2, of the articles reported to the Sixth Committee of the General Asssembly in 1980 permits "system agreements" with respect to something less than an entire international watercourse system, "provided that the use by one or more other system States of the waters . . . is not, to an appreciable extent, affected adversely".[287] And article 4, paragraph 2, of the same articles further provides that a system State is entitled to participate in the negotiation of a system agreement (to the extent that its use is thereby affected) if its use of the waters of an international watercourse system "may be affected to an appreciable extent" by a proposed system agreement applicable to something less than the system as a whole.[288]

138. Simply put, "appreciable" stands for more in quantity than is denoted by "perceptible", which could be construed to mean only barely detectable. "Appreciable" means less in quantity than terms such as "serious" or "substantial". With any such qualifying term out of ordinary language there is always the difficulty of determining, as in this case, just what quantity of harm satisfies "appreciable". As the Commission has reported in paragraph (10) of its commentary to the tentatively approved article 4, as set forth in chapter V of its 1980 report to the General Assembly:

> In the absence of any mathematical formula for fixing the extent to which use or enjoyment of system water should be affected in order to support participation in a negotiation, effect on a system State to an "appreciable extent" is proposed as the criterion. This extent is one which can be established by objective evidence (provided that the evidence can be secured). There must be a real impairment of use.[289]

139. It is perhaps worth noting again that the "draft principles of conduct in the field of environment for the guidance of States in the conservation and harmonious utilization of natural resources shared by two or more States" employ "significantly affect", which signifies, according to the single definition accompanying the draft principles, "any appreciable effects on a shared natural resource and excludes *de minimis* effects".[290]

140. In any event, measuring the quantity of such a qualifying term is not a new task for the law. Such descriptive terms denoting a certain standard are frequently unavoidable, and not only in customary law. The problem presented itself long ago with such verbal standards as "reasonable care", "probable cause", "reasonable time", "reasonable use", *rebus sic stantibus*, "substantial capacity", "substantial compliance" (or "performance"), "minimum standard of justice", *force majeure*, "excessive force", and even *de minimis* itself.[291]

141. Since what is intended in this new article on responsibility for harm is the same quantity already expressed in articles 3 and 4, adopted at the Commission's thirty-second session, in 1980, it is imperative that the same term "appreciable" be used. In its use of "appreciable", the Commission desires to convey as clearly as possible that the effect or harm must have at least an impact of some consequence, for example on public health, industry, agriculture or environment in the affected system State, but not necessarily a momentous or grave effect, in order to constitute transgression of an interest protected by international law.[292]

3. Making the rule more definite and certain

142. The Special Rapporteur is persuaded that the time has come to cast the *sic utere tuo* principle, appropriately qualified, as a clear rule with respect to international watercourse systems. The classical case, as previously noted, is the Canada–United States *Trail Smelter* arbitration. [293] Moreover, in the *Lake Lanoux* arbitration between France and Spain, decided in 1957, the tribunal inferred that, if the waters returned to the lake in France after use had had a harmful chemical composition, temperature or other condition, the claim of Spain would have been sustained.[294]

143. But, in addition to pollution, direct conflicts between or among uses are also capable of resulting in harm to a system State. The Institute of International Law, in article 2 of its 1961 resolution on the utilization

(*Footnote 285 continued.*)

text of the relevant paragraphs is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), pp. 340–341, document A/CN.4/274, para. 370.)

[286] For the text of the European Water Charter, *ibid.*, pp. 342–343, para. 373.

[287] *Yearbook . . . 1980*, vol. II (Part Two), p. 112, para. 98 (see also para. 8 above).

[288] *Ibid.*, p. 118.

[289] *Ibid.*, p. 119. The commentary supports its position with, *inter alia*, the *Lake Lanoux* arbitration, the Statute annexed to the 1964 Convention on the development of the Chad Basin, the 1929 Convention on certain questions relating to the law on watercourses between Norway and Sweden, the 1933 Convention regarding the determination of the legal status of the frontier between Brazil and Uruguay, and the Helsinki Rules.

[290] UNEP/1G.12/2, annexed to document UNEP/GC.6/17.

[291] See *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, observations of M. S. McDougal (pp. 300–301) in response to J. J. A. Salmon's questionnaire (pp. 294–295).

[292] One legal definition of "appreciable" is: "Capable of being estimated, weighed, judged of, or recognized by the mind. Capable of being perceived or recognized by the senses. Perceptible but not a synonym of substantial." See *Black's Law Dictionary (op. cit.)*.

The inflicting of appreciable harm of a particular kind may, considering the total circumstances, become permissible within the context of a system State's equitable participation. See sect. B of this chapter.

[293] United Nations, *Reports of International Arbitral Awards*, vol. III . . ., p. 1964.

[294] *Ibid.*, vol. XII . . ., p. 285.

of non-maritime international waters except for navigation, implicitly recognized this possibility by qualifying every State's right to utilize waters which traverse or border its territory by making the right "subject to the limits imposed by international law" and by specifying that such right "is limited by the right of utilization of other States interested in the same watercourse or hydrographic basin".[295] The preamble of the resolution includes the statement that "the obligation not to cause unlawful harm to others is one of the basic general principles governing neighbourly relations".[296]

144. As even a cursory study of the subject of natural and man-made hazards reveals, a wide variety of "incidents" could, and on occasion do, occur that might involve a system State's responsibility, either for negligence or for failure to exercise the ordinary standard of care in the management of its portions of the international watercourse and the hydraulic works and installations associated therewith.[297]

145. Dams in rare instances give way; spills of highly toxic chemicals may amount to more than a "pollution problem to be studied". Damage may be catastrophic and involve, among other irreversible effects, the loss of thousands of lives. The filling of a reservoir may obliterate inland wetlands of unusual value to the ecology of a particular region as well as deprive downstream irrigators, industry and municipalities of their vital supply; a valuable fishery may be destroyed for all parties. The diversion of a stream, or the withholding of much of its flow, may deprive important groundwaters of their natural recharge; river regulation or "training" may deprive deltas and estuaries of floods or scouring flows that have sustained agriculture, navigation and coastal fisheries. The point need not be belaboured that harm can proceed from a variety of sources other than pollution.

146. It is frequently said, however, that the upper riparian is at a disadvantage as concerns this matter of State responsibility, since it is presumed that most, if not all, harm proceeds from upstream to downstream. A standard consequence is that floods and contamination originating in an upstream system State may have their most harmful effects in downstream system States. Since water flow is governed by gravity (where it is not being pumped to a higher elevation), that belief seems logical, but it is only partly true. Insufficient attention has been given in connection with State responsibility to the works and conditions *downstream* that may adversely affect upstream system States. A number of illustrations are well known concerning rivers subject to more than one jurisdiction. For example, pollution of the lower reaches of a watercourse has often proved sufficient to discourage or inhibit entirely anadromous and catadromous fish migration, adversely affecting commercial and recreational fishing upstream.

147. Dams, barrages or weirs downstream are obviously capable of preventing or limiting not only navigation but also fish migration and timber floating. Incidentally, locks, where provided, to some extent retard traffic along the watercourse and do not accommodate ships in excess of a certain breadth and draft.[298] In cold climates, the reservoir and locks may not remain free of thick ice as once did the open channel. These conditions may make water transportation more expensive and time-consuming, matters of critical importance to upstream States. Ordinary fish ladders, moreover, have not been found to be successfully adapted to by the fish in some cases and circumstances.

148. Dams downstream create artificial lakes behind them that may change the ecology of the surrounding region, including the territory of an upstream system State. The same artificial lake may flood upper riparian land continuously from the time of the initial filling or during the times when the operators of the dam are accumulating the maximum amount of water for later power generation or supply uses; also, silt may be deposited further upstream as a result of such changes in the regime of the river downstream. In rather flat regions, in particular, the presence of a large new lake may so raise the subterranean water table as to cause drainage problems, for example on agricultural lands, in mines and in the basements of homes and factories. If the flooding is serious, relocation of road and rail routes, of communication lines and even of whole towns may be required.

149. A lower riparian may also overfish a fishery in the river or lake, reducing the catch by the upper riparians: this result is not limited to migratory species. Failure to let down high season waters downstream (by opening dam floodgates or the installation of

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[295] *Annuaire de l'Institut de droit international, 1961*, p. 382. (The text of the resolution is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 202, document A/5409, para. 1076.)

[296] Moreoever, art. 4 refers to the right of other States to enjoyment of the advantages to which they are entitled under art. 3 (i.e. "on the basis of equity"), as well as to adequate compensation for any loss or damage.

[297] Under certain circumstances, affirmative precautionary actions may be the duty of a system State, including action with respect to the treatment of a dangerous condition arising in its own territory; the duty appears to include timely communication of appropriate warnings to States that may be affected if an incident in fact occurs. Although in the article here proposed the legal obligation is in the usual proscriptive form, that is, appreciable harm is *not* permitted, contemporary, not to mention future, conditions may be deemed to exact a more affirmative duty to undertake measures—to be the good neighbour in the positive sense. See, in this connection, the remarks on the *Württemberg and Prussia* v. *Baden* case (1927) in para. 121 above. The Netherlands and the Federal Republic of Germany, in their 1960 Treaty on boundary waters and other frontier questions, agreed "to take or to support all measures required to establish and to maintain . . . such orderly conditions as will mutually safeguard their interests", and neither to take nor to "tolerate any measures causing substantial prejudice to the neighbouring State" (art. 58, para. 1); specified five areas of "positive" action to prevent harm (art. 58, para. 2); and agreed to "endeavour, within the limits of their financial resources, to effect such improvements in the use and management of the boundary waters within their respective territories as will serve their mutual interests, and to participate financially, where such participation is equitable, in measures taken in respect of the boundary waters within the territory of the neighbouring State" (art. 58, para. 3) (United Nations, *Treaty Series*, vol. 508, pp. 190–192). In the Indus Waters Treaty (India and Pakistan, 1960), "Each party will use its best endeavours to maintain the natural channels of the rivers, . . . in such condition as will avoid, as far as practicable, any obstruction to the flow in these channels likely to cause material damage to the other party" (art. IV, para. 6) (*ibid.*, vol. 49, p. 138).

[298] It should not go without mention that low bridges and causeways across watercourses can impose comparable burdens upon water transport; trans-river "tunnel" structures may be laid so shallowly as to restrict or endanger navigation during low flow periods. On the other hand, damming may significantly improve if not extend navigation upstream (as is the case of the upper Mississippi and Uruguay rivers), but this section of the report concerns harm and not possible benefit, which would be weighed in the balance of the system States' equitable participation (see sect. B above).

inadequate gates) may result in the flooding of the territory of upper riparians.

150. Inadequate navigational aids, including reporting to upper riparians of new or shifted sandbars or channels, as well as poor channel maintenance, can cause accidents and delays to shipping to and from the upper riparians; a lower riparian's sudden restriction of piloting within its territory to its nationals raises the cost of navigation to upper riparians and deprives the upper riparians' pilots of part of their livelihood. A reduction in flow from a major downstream tributary (for example, because of diversion for irrigation) may result in the silting up of channels of the mainstream and delta, diminishing if not obstructing navigation and floating for upper riparians. Failure to maintain channel depth (by dredging or weirs) downstream diminishes the size of vessels that can successfully navigate to and from upper parts of the international watercourse. Failure to remove ice, log jams or other obstacles downstream blocks timber floating and navigation for the upper riparians. Imposition of unreasonable or discriminatory fees or regulations by a lower riparian may result in delays and increases the cost of shipping and floating to and from upper riparians; avoidable congestion of the lower riparian's navigable channels and ports delays shipping. The closing of a river by the lower riparian (for example, for "naval exercises" or for public safety reasons) in fact deprives upper riparians of the use of the river for transport.

151. Thus a highly beneficial use or a combination of uses downstream—generation of electricity, shunting of water into a mill, storage for irrigation or industrial use, regulation (including flood control), blockage of saltwater intrusion and recreational uses, for example—may result in appreciable harm to one or more upstream system States.

152. Moreover, the refusal of a lower riparian, for example, to pay compensation, make contribution, or share power (as indicated or appropriate under the circumstances), may be judged to deprive an upper riparian of its equitable participation. The creation of, or failure to eliminate, vector breeding grounds, especially in irrigation works, dam spillways and marshy areas, may result in the spread of insects or other transmitters of disease, and thus the disease, to neighbouring territories, including upstream.[299]

153. Just as important as the test of "appreciable" is the construction of a just balance in the procedural aspects of determining and then quashing the charge or imposing, or excusing, a finding of appreciable harm.[300] Every effort has been made to heed the clear insistence that that no system State be entitled to brandish a veto over the head of a State proposing a modification of the régime of the international watercourse system, consistent with affording each possibly adversely affected State access to the facts and respectable opportunities to evaluate the situation and to propose or to consider adjustments to resolve the question, and even to have its findings challenged. The tribunal in the 1957 *Lake Lanoux* arbitration, addressing the issue of the requirement of agreement with Spain prior to France's implementation in its own territory of the hydraulic works, said:

> Undoubtedly international practice discloses some specific cases in which this assumption is proved; . . . But these cases are exceptional and international case law does not readily recognize their existence, especially when they infringe upon the territorial sovereignty of a State, which woud be true in the present case.
>
> In fact, to evaluate in its essence the need for a preliminary agreement, it is necessary to adopt the hypothesis that the States concerned cannot arrive at an agreement. In that case, . . . a State which ordinarily is competent has lost the right to act alone . . . This is to admit a "right of consent", a "right of veto", which at the discretion of one State paralyses another State's exercise of its territorial competence.
>
> For this reason, international practice prefers to resort to less extreme solutions, limiting itself to requiring States to seek the terms of an agreement by preliminary negotiations without making the exercise of their competence conditional on the conclusion of this agreement. . . . but the reality of the obligations thus assumed cannot be questioned, and they may be enforced, for example, in the case of an unjustified breaking off of conversations, unusual delays, disregard of established procedures, systematic refusal to give consideration to proposals or adverse interests, and more generally in the case of infringement of the rules of good faith.[301]

154. The procedural steps and safeguards here proposed are not regarded as stringent, except with respect to the duty to comply with them in good faith. The Special Rapporteur believes that, just as proposing States in practice do not tolerate paralysation of their enterprises, potentially affected States in practice do not countenance a State's complete freedom of action, at least with respect to activities affecting shared water resources, where objectively the activity will or may set into motion significantly detrimental, perhaps irreversible, changes. The duty to inform and to consult, and then to work out a solution that obviates the expected appreciable harm, is now cardinal in the field of shared water resources. To proceed unmindful of the sovereign interest of other system States may often constitute culpable behaviour, contrary to existing international law.

155. Finally, not so much "right" is given the system State claiming that it may be affected that it is permitted to convert its legitimate interest and that of the international community into harassment of the proposing State. Concern on this point has been voiced in

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[299] Other examples could be cited, such as allowing the spread of the water hyacinth or other plant pests; downstream canalization or bed stabilization works, which alter the normal régime of the river, including the grading of the bed upstream; artificial islands downstream causing adverse changes in the flow régime upstream, including bank erosion; and artificial recharge of aquifers (by flood protection programmes or injection, for example), that inhibit surface drainage in an upstream State.

[300] Of course, in some cases there may be damage without compensation being justified. See Bourne, "The right to utilize the waters of international rivers", *loc. cit.*, pp. 230 and 259.

[301] *Yearbook . . . 1974*, vol. II (Part Two), p. 197, document A/5409, para. 1065. For the full text of the award, see United Nations, *Reports of International Arbitral Awards*, vol. XII . . ., p. 285 (in French). See also the following statements in a report by the OECD Environment Committee entitled "Application of information and consultation practices for preventing transfrontier pollution":

> ". . . information and consultation should respect the *sovereignty* and legitimate interests of the countries between which they take place . . . Consequently they would miss their purpose completely if their effect were to make a decision by one country to undertake an activity or measure likely to create a significant risk of transfrontier pollution entirely dependent on the prior consent of the exposed country(ies)" (OECD, *Transfrontier Pollution and the Role of States* (Paris, 1981), p. 11. On absence of a veto, see OECD, *Legal Aspects of Transfrontier Pollution* (Paris, 1977), p. 47, footnote 2.

the Sixth Committee. The Special Rapporteur has tried to fashion a workable and tentative balance, respecting both sets of interests and apprehensions.

4. The proposed article

156. The following draft article is proposed for the consideration of a successor Special Rapporteur and the Commission on the matter of responsibility:

Article 8. Responsibility for appreciable harm

1. The right of a system State to use the water resources of an international watercourse system is limited by the duty not to cause appreciable harm to the interests of another system State, except as may be allowable under a determination for equitable participation for the international watercourse system involved.

2. Each system State is under a duty to refrain from, and to restrain all persons under its jurisdiction or control from engaging in, any activity that may cause appreciable harm to the interests of another system State, except as may be allowable under paragraph 1 of this article.

3. Before a system State undertakes, authorizes or permits a project or programme that may cause appreciable harm to the interests of another system State, as determined on the basis of objective scientific data, notice accompanied by technical information and data shall be made available by the former State (the proposing State) to the system State that may be affected. The technical data and information provided must be sufficient to enable the other system State to determine accurately and to evaluate the potential for harm of the intended project or programme.

4. The proposing State under paragraph 3 of this article shall allow the other system State, unless otherwise agreed, a period of not less than six months to study and evaluate the potential for harm of the project or programme and to communicate its determination to the proposing State. The proposing State shall co-operate with the other system State should additional data or information be deemed to be needed for a proper evaluation. During the said or agreed upon evaluation period the project or programme may not be initiated without the consent of the other system State.

5. If the other system State under paragraphs 3 and 4 of this article determines that the intended project or programme would, or is likely to, cause appreciable harm to its interests and such harm is deemed by the other system State not allowable under the proposing State's equitable participation, and makes timely communication thereof to the proposing State, the proposing State and the other system State are under a duty, promptly after communication of such determinations to the proposing State, to consult with the objective of verifying or adjusting the other system State's determinations, and of arriving at such modifications of the intended project or programme by negotiation as will eliminate any remaining cause of appreciable harm not allowable under the proposing State's equitable participation, except that compensation acceptable to the other system State may be substituted for project or programme modification.

6. If the other system State under paragraph 4 of this article fails to communicate to the proposing State its determination that a project or programme would, or is likely to, cause appreciable harm within the period provided under paragraph 4 of this article, the proposing State may proceed to execute the project or programme in the form and to the specifications communicated to the other system State without responsibility for subsequent harm to the other system State from that project or programme, provided that the proposing State is in full compliance with paragraphs 3 and 4 of this article.

7. In the event that the other system State under paragraphs 3, 4 and 5 of this article communicates its determination that the intended project or programme would, or is likely to, cause appreciable harm to its interests and the proposing State formally declares and demonstrates to the other system State that the project or programme in question is of the utmost urgency, the proposing State may proceed without further delay with the project or programme, provided that the proposing State is in full compliance with paragraphs 3, 4 and 5 of this article and provided that the proposing State demonstrates willingness and financial capability to compensate the other system State in full measure, by way of guaranty or otherwise, for all appreciable harm caused thereby. In such event, the proposing State shall be liable for all appreciable harm caused by the project or programme to the other system State. No provision of this paragraph shall relieve the proposing State from its duty to consult and to negotiate in accordance with paragraph 5 of this article.

8. Irreconcilable differences between the proposing State and the other system State, with respect to the adequacy of compliance with this article or concerning the evaluation of the potential for harm of the intended project or programme or regarding modifications of the project or programme in question or with respect to either system State's equitable participation, shall be resolved by the most expeditious procedures of pacific settlement available to and binding upon the parties, or in accordance with the dispute settlement provisions of these articles.

9. If a proposing State fails to comply with the provisions of this article, it shall incur liability for the harm caused to the interests of other system States as a result of the project or programme in question.

157. Paragraph 1 of the proposed article affirmatively states the basic rule under general international law, being careful to take into account the possibility of permissible harm even of an appreciable amount or quality provided it falls within the context of equitable participation (see section B above). Respect for the basic rule is reflected in paragraph 2 in the form of a duty to refrain from causing appreciable harm, and to prevent others (persons both natural and legal) from causing such harm; the same exception in the context of equitable participation is also here included.

158. Paragraph 3 sets forth the indispensable minimal procedural steps for the tolerable coexistence of system States where significant development projects or programmes are planned for the international watercourse system. A duty to refrain from causing appreciable harm, cautiously observed, might otherwise result in a slowing down, if not paralysis, of works and activities affecting the water resources. Doubts, divergences of criteria or convictions, or impasses cannot be resolved if the system States are not in communication with one another, particularly at the technical level of project

and programme data and information, at least where these works and activities may have significant transnational impact. Thus a requirement to give notice and to provide the necessary and relevant information and data should not be omitted from the Commission's article on responsibility for appreciable harm.[302] To be sure, system States should be encouraged in appropriate cases to strengthen this residual duty by more detailed procedures and more specific scope for their data and information exchange in system agreements. The proposed article serves to foster the minimal co-operation essential to their beneficial use of their shared water resources. The objective here is to avoid costly and unnecessary disputes by promoting, through minimal duties, essential co-operation between the States concerned.

159. The system State likely to be affected must, after being put on notice, have a reasonable period to study the works or actions proposed by its co-system State.[303] During this fixed period of evaluation, the proposing system State is barred from implementing its plan, an element of the principle of good neighbourship, of "voisinage".[304] On the other hand, the system State receiving notice and necessary and relevant information and data must not delay its response beyond a reasonable time; otherwise it would be able to delay, or block, the development of the proposing State. Paragraph 4 of the proposed article addresses this troublesome point. Although the system States concerned are free to agree upon a shorter or longer period for the evaluation of the project or programme, a certain period is called for and justified in this procedural rule in order to avoid disputes over what is a "reasonable" time. The Special Rapporteur submits six months as reasonable, in the absence of agreement specifying a different period or a different procedure.

160. The amount and kinds of information or data provided by the proposing State may be deemed insufficient by the system State upon which notice has been served. Although determination by the notified State of insufficiency, or sufficiency, should not be part of a rule of international law, it is not excessive to require the proposing State to co-operate with its co-system State should additional information or data be requested. Again, communication between the system States concerned is essential, including the proffering of justification by the State requesting more information and compliance or explanation by the proposing State. Paragraph 4 anticipates such situations. Finally, paragraph 4 allows implementation of the proposed works or programme during the time allotted to the other system State to carry out its evaluation, if the latter agrees to the implementation.

161. Paragraph 5 of the proposed article carries co-operation one step further, to the stage of discussions about the scope or specifications of the proposed project or programme in the event that the system State notified ascertains that indeed the impact on its interests would be such as to amount to appreciable harm, or that such harm is likely. The system State likely to be affected is required to give notice of its determination to the proposing State, after which both States are obliged without delay to enter into consultations. Failure of either party to initiate, or to respond to the initiative of the other promptly, would constitute a breach. Although this step could be styled "negotiations", "consultations" is preferred because of the technical nature of the discussions and the assumption of affirmative disposition on both sides to find an accommodation that preserves as much as possible the outcome of the original proposal while removing or diminishing the aspects that would be, or might be, harmful to the other system State.[305]

162. The rule in paragraph 5 does not require modification to the extent of removing all harm to the other system State, but only such changes as will avoid impermissible *appreciable* harm. The possibility that, under the proposing State's equitable participation, the appreciable harm in this case must be accepted by the other system State, is acknowledged. Modern multipurpose projects and programmes contemplate, under appropriate and agreed circumstances, the yielding of a use or benefit by one system State in order that the greater total benefits of the integral project or programme, or of a set of works and programmes, may be achieved. The system State constricting or even forgoing its particular use or benefit would normally be compensated for the value of its sacrifice; such compensation might be financial, or it might be in the form of electricity supplies, flood control measures, enlargement of another use, or other good. Compensation would have to be for agreed amounts and kinds, a possibility that should be anticipated by the Commission's articles.[306]

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[302] Art. XXIX, para. 2, of the Helsinki Rules provides that a State "should in particular furnish to any other basin State, the interests of which may be substantially affected, notice of any proposed construction or installation which would alter the régime of the basin in a way which might give rise to a dispute . . . The notice should include such essential facts as will permit the recipient to make an assessment of the probable effect of the proposed alteration" (ILA, *Report of the Fifty-second Conference . . .*, p. 518). In art. 5 of the resolution adopted at its Salzburg session in September 1961, the Institute of International Law recognized as a rule of international law that "works or utilizations [of the waters of a watercourse or hydrographic basin which seriously affect the possibility of utilization of the same waters by other States] may not be undertaken except after previous notice to interested States" [*Annuaire de l'Institut de droit international, 1961*, p. 383).

[303] The corresponding provision (art. XXIX, para. 3) in the Helsinki Rules states: "A State providing the notice . . . should afford to the recipient a reasonable period of time to make an assessment of the probable effect of the proposed construction or installation and to submit its views to the State furnishing the notice" (*ILA, Report of the Fifty-second Conference . . .*, p. 519).

[304] The Institute of International Law, in art. 7 of its "Salzburg resolution", recognized as a rule of law that: "During the negotiations, every State must, in conformity with the principle of good faith, refrain from undertaking the works or utilizations which are the object of the dispute or from taking any other measures which might aggravate the dispute or render agreement more difficult" (*Annuaire de l'Institut de droit international, 1961*, p. 383).

[305] In art. 6 of its "Salzburg resolution", the Institute approved the following formulation:

"In case objection is made, the States will enter into negotiations with a view to reaching an agreement within a reasonable time.

"For this purpose, it is desirable that the States in disagreement should have recourse to technical experts and, should occasion arise, to commissions and appropriate agencies in order to arrive at solutions assuring the greatest advantage to all concerned".

[306] Art. 4 of the "Salzburg resolution" provides:

"No State can undertake works or utilizations of a watercourse or hydrographic basin which seriously affect the possibility of utilization of the same waters by other States except on condition of assuring them the enjoyment of the advantages to which they are entitled under Article 3 [on the basis of equity, taking particular account of their respective needs, as well as other pertinent

163. In order to achieve the necessary balance between the rights of the system State likely to be affected and those of the proposing State, paragraph 6 frees the proposing State from the restraint imposed under paragraph 4 if notice is not given to the proposing State by the expiration date of the period—either the period unilaterally specified by the proposing State, which may not be less than six months, or the shorter or longer period agreed upon. Failure to deliver to the proposing State its determination of definite or likely appreciable harm within the allowed period authorizes implementation of the project or programme, as communicated to the co-system State. This proviso clearly eliminates any undue delay where the other system State cannot show that the project or programme involves appreciable harm or is withholding its response for whatever reason. However, it would be improper to allow the proposing State to implement a different project or an altered programme, since the transnational impact might very well be significantly at variance with the original design and size notified to the other system State. Paragraph 6 describes such deviation and also requires that the proposing State shall have lived up to its obligations to give notice, to provide sufficient information and data and to abstain from implementation prior to the expiration of the evaluation period (paras. 3 and 4 of this article) in order to be free to carry out its proposal in default of timely notification by the other system State.

164. Under this article addressed to responsibility for appreciable harm, it is more likely that the system State given notice by a proposing system State will in fact respond within the prescribed time period, given the clarity of the procedural requirements and the potential penalty attached to failing or refusing to answer. Thus paragraph 5 covers the situation of notice to the proposing State that the project or programme could cause the co-system State appreciable harm; paragraph 6 releases the proposing State in the event of no timely response by the other system State.

165. Paragraph 7 deals with the proposing State's right to proceed under certain extraordinary circumstances.[307] It is possible that immediate execution of a particular project or programme is clearly necessary in order to avoid disastrous consequences. Under such circumstances the proposing State may, under this article, choose to make formal declaration as to urgency and proceed with the project in the face of notice that appreciable harm to its interests is predicted by a co-system State. The declaration of "utmost urgency" may not be a hollow statement, however. The proposing State must demonstrate the urgency. Moreover, it must give its co-system State the notice, information and data, and time for evaluation (paras. 3 and 4), and it must go forward with its obligation to consult (para. 5), or it is not free to execute the project or programme. A final sentence is added, emphasizing the continuing duty to consult and to negotiate even where urgency allows immediate implementation. Modifications avoiding some of or all the anticipated appreciable harm may possibly be engineered during the implementation phase; further examination of the project or programme on a joint basis may lead to the conclusion that the harm feared by the co-system State will not in fact be appreciable; compensation for any appreciable harm may be negotiated. Other system States may realize, or be made to realize, the danger and urgency, resulting in system State collaboration in appropriate circumstances.

166. If the proposing State executes the required measures unilaterally, the system State likely to be adversely affected has a right to certain assurances from the proposing State, also under paragraph 7. The proposing State's ability and willingness fully to compensate its co-system State must be demonstrated, and the paragraph makes the proposing State liable for the appreciable harm.

167. The following provision, paragraph 8, anticipates that system States may not be able to agree upon questions of harm, compensation, or project or programme modification. Because the proposing State has a right to prompt resolution of these issues, because of the critical nature of water resources works and programmes generally, and because the other system State can have no legal basis for avoiding peaceful resolution, this clause requires recourse to the swiftest means of pacific settlement which the system States concerned have accepted, or, in the alternative, recourse to the provision in these articles concerning settlement of disputes. A separate article on settlement or avoidance of disputes is anticipated by this article. The Commission may, in that connection, choose to provide for recourse to the International Court of Justice or to a chamber of the Court for arbitration or for some other settlement procedure, such as conciliation.

168. The final paragraph of article 8 sets forth unequivocally the liability of a proposed State that fails to meet the obligations of the article, both procedural and substantive. It will be noted that liability under this paragraph is not restricted to the *appreciable* harm caused.[308]

169. A number of illustrations in State practice have already been set out that point the way to the provisions of the suggested article. A few additional passages follow which are pertinent to consideration of the proposed requirements and language of this suggested draft article.

170. With respect to the question of notification and consultation between the system State intending to modify the régime of the international watercourse and the possibly affected system State, the Inter-American Juridical Committee, responding to the observations and recommendations of the Inter-American Council

circumstances], as well as adequate compensation for any loss or damage".

[307] Some system States have covered emergency situations in their agreements. An example is the final para. of art. 29 of the 1922 Convention relating to watercourses and dikes on the Danish-German frontier:

"Protective measures taken in cases of necessity when danger is threatening require no authorization. If, however, they become permanent, authorization [from the Frontier Water Commission] shall be obtained when the immediate danger has been averted" (League of Nations, *Treaty Series*, vol. X, p. 217).

[308] According to art. XXIX, para. 4, of the Helsinki Rules: "If a State has failed to give the notice . . ., the alteration by the State in the régime of the drainage basin shall not be given the weight normally accorded to temporal priority in use in the event of a determination of what is a reasonable and equitable share of the waters of the basin" (ILA, *Report of the Fifty-second Session* . . ., p. 519).

of Jurists[309] and of members of the Organization of American states, prepared a revised report and draft convention on industrial and agricultural use of international rivers and lakes in 1965.[310] In the section of the report entitled "Notificacion y procedimiento", the following is set forth:

Paragraph (*e*) of the scheme drawn up by the Council of Jurists states:

> "It is desirable to establish an appropriate procedure to ensure notification or consultation between riparian States if one of them wishes to carry out works for the utilization of the waters of international lakes or rivers for agricultural or industrial purposes."

The Convention would clearly be incomplete without this section. It is obviously not sufficient to enunciate general principles if, when a case arises, the parties are not required to establish contact in order to compare views and try to reconcile their interests.

It should therefore be made mandatory for interested States to be notified of the intention of another State to carry out such works. In this way, potentially serious conflicts are eliminated and, instead, understanding among States will be facilitated, to the benefit of the works themselves, because, once agreement among the interested States has been confirmed, they will be able to proceed more rapidly and free of material or legal obstacles.[311]

171. Based on these and related considerations, the pertinent articles of the revised draft convention of the Inter-American Juridical Committee read:

Article 5

The utilization of the waters of an international river or lake for industrial or agricultural purposes must not prejudice the free navigation thereof in accordance with the applicable legal rules, or cause substantial injury, according to international law, to the riparian States or alterations to their boundaries.

Article 6

In cases in which the utilization of an international river or lake results or may result in damage or injury to another interested State, the consent of that interested State shall be required, as well as the payment or indemnification for any damage or harm done, when such is claimed.

. . .

Article 8

A State that plans to build works for utilization of an international river or lake must first notify the other interested States. The notification shall be in writing and shall be accompanied by the necessary technical documents in order that the other interested States may have sufficient basis for determining and judging the scope of the works. Along with the notification, the names of the technical expert or experts who are to have charge of the first international phase of the matter should also be supplied.

Article 9

The reply to the notification must be given within six months and no postponements of any kind may be allowed, unless the requested State asks for supplementary information in addition to the documents that were originally provided, which request may be made only within thirty days following the date of the said notification and must set forth in specific terms the background information that is desired. In such case, the term of six months shall be counted from the date on which the aforesaid supplementary information is provided.

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If no reply is received within the aforesaid period, it shall be understood that the State or States that were notified have no objections to the work that is being planned and that, consequently, the notifying State may proceed to execute its plans in accordance with the project that was presented. No later claim by the notified State shall be valid.

II

If observations of a technical nature or relating to foreseeable damage or injury are made in the reply to the notification, this document should indicate the nature and estimate of these and the name of the technical expert or experts who together with those mentioned in the notification will form a Joint Commission that will proceed to study the matter. The reply should also include an indication of the place and date for the meeting of the Joint Commission thus formed.

If the reply does not meet the foregoing requirements, it shall be considered that this procedure has not been executed.

The Joint Commission shall carry out its mandate of seeking a solution, both with respect to the best way of executing and taking advantage of the works that are planned in common benefit, and, when appropriate, with respect to indemnification for the damage and injury caused, all within the period of six months from the date of the reply to the notification.[312]

172. An important precedent for the Inter-American Juridical Committee was the 1933 Declaration of Montevideo, a resolution of the Seventh International Conference of American States.[313] The awareness in that relatively early resolution of the importance of the procedural aspects of notification and consultation, and of expeditious resolution of differences, is patent:

2. . . . no State may, without the consent of the other riparian State, introduce into watercourses of an international character, for the industrial or agricultural exploitation of their waters, any alteration which may prove injurious to the margin of the other interested State.

3. In the cases of damage referred to in the foregoing article, an agreement of the parties shall always be necessary. When damages capable of repair are concerned, the works may only be executed after adjustment of the incident regarding indemnity, reparation (or) compensation of the damages, in accordance with the procedure indicated below.

. . .

7. The works which a State plans to perform in international waters shall be previously announced to the other riparian or co-jurisdictional States. The announcement shall be accompanied by the necessary technical documentation in order that the other interested States may judge the scope of such works, and by the name of technical expert or experts who are to deal, if necessary, with the international side of the matter.

8. The announcement shall be answered within a period of three months, with or without observations. In the former case, the answer shall indicate the name of the technical expert or experts to be charged by the respondent with dealing with the technical experts of the applicant, and shall propose the date and place for constituting the Mixed Technical Commission of technical experts from both sides to pass judgement on the case. The Commission shall act within a period of six months, and if within this period no agreement has been

[309] Resolution I, adopted at the fifth meeting of the Inter-American Council of Jurists (Organization of American States, *Rios y lagos internacionales . . . (op. cit.)* p. 117).

[310] *Ibid.* (The text of the revised draft convention is reproduced in part in *Yearbook . . . 1974*, vol. II (Part Two), pp. 350–351, document A/CN.4/274, para. 379.)

[311] Organization of American States, *Rios y lagos internacionales . . .*, p. 128.

[312] *Ibid.*, pp. 132–134. The Inter-American Council of Jurists had instructed the Committee to consider, among several "basic points": "In case of lack of agreement between the riparian States, provision should be made for procedures to facilitate an understanding, to guarantee the exercise of the rights of the parties and to promote settlement of the dispute, in the spirit of equity and co-operation which inter-American good-neighbourliness and solidarity require" (*ibid.*, p. 120).

[313] Resolution LXXII (*ibid.*, pp. 111–113). (The text of the Declaration is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 212, document A/5409, annex I.A.) For a discussion of the background of the resolution see Organization of American States, *Rios y lagos internacionales . . .*, pp. 1–2. In its first report, in 1963, the Committee concluded, *inter alia*, that the Declaration of Montevideo was a satisfactory statement of principles for present needs (Pan American Union, *Industrial and Agricultural Use . . . (op. cit.)*, p. v).

reached, the members shall set forth their respective opinions, informing the Governments thereof.

9. In such cases, and if it is not possible to reach an agreement through diplomatic channels, recourse shall be had to such procedure of conciliation as may have been adopted by the parties beforehand or, in the absence thereof, to the procedure of any of the multilateral treaties or conventions in effect in America. The Tribunal shall act within a period of three months, which may be extended, and shall take into account, in the award, the proceedings of the Mixed Technical Commission.[314]

173. Although the requirements in the article suggested for the consideration of a successor Special Rapporteur and the Commission are less exacting and detailed than those projected historically within the Inter-American system, the element of urgency is preserved. Similarly concerned with the price of delay, the Council of OECD adopted in 1974 a recommendation on principles concerning transfrontier pollution, which, among specific principles annexed, sets forth a "principle of information and consultation":

6. Prior to the initiation in a country of works or undertakings which might create a significant risk of transfrontier pollution, this country should provide early information to other countries which are or may be affected. It should provide these countries with relevant information and data, the transmission of which is not prohibited by legislative provisions or prescriptions or applicable international conventions, and should invite their comments.

7. Countries should enter into consultation on an existing or foreseeable transfrontier pollution problem at the request of a country which is or may be directly affected and should diligently pursue such consultations on this particular problem over a reasonable period of time.

8. Countries should refrain from carrying out projects or activities which might create a significant risk of transfrontier pollution without first informing the countries which are or may be affected and, except in cases of extreme urgency, providing a reasonable amount of time in the light of circumstances for diligent consultation. Such consultations held in the best spirit of co-operation and good neighbourliness should not enable a country to unreasonably delay or to impede the activities or projects on which consultations are taking place.[315]

174. In an analogous field, Canada and the United States of America recently entered into an Agreement relating to the exchange of information on weather modifications activities, which illustrates contemporaneous recognition of the importance of proceeding as good neighbours. The preamble takes "into particular consideration the special traditions of prior notification and consultation and the close co-operation that have historically characterized their relations".[316] The operative articles contain commitments by each party "to notify and to fully inform the other . . . prior to the commencement of such activities" and "to provide such notice as far in advance . . . as may be possible" (art. IV).[317] Also, the parties "agree to consult, at the request of either party, regarding particular weather modification activities of mutual interest. Such consultations shall be initiated promptly on the request of a party, and in cases of urgency may be undertaken through telephonic or other rapid means of communications . . ." (art. V). Extreme emergencies "may require immediate commencement . . . of weather modification activities of mutual interest . . . In such cases, the party commencing such activities shall notify and fully inform the other party as soon as practicable, and shall promptly enter into consultations at the request of the other party" (art. VI).

175. The Sub-Committee of the Asian–African Legal Consultative Committee proposed to put the matter simply, but also would make consultation mandatory:

A State which proposes a change of the previously existing use of the waters of an international drainage basin that might seriously affect utilization of the waters by another co-basin State must first consult with the other interested co-basin States . . .[318]

And the United Nations Conference on the Human Environment recommended, in its Action Plan for the Human Environment, that the following principle be considered by the States concerned when appropriate:

Nations agree that when major water resource activities are contemplated that may have a significant environmental effect on another country, the other country should be notified well in advance of the activity envisaged.[319]

The General Assembly, as it acted to implement principles 21 and 22 of the Stockholm Declaration, recognized, in paragraph 2 of its resolution 2995 (XXVII) of 15 December 1972, that co-operation among States

will be effectively achieved if official and public knowledge is provided of the technical data relating to the work to be carried out by States within their national jurisdiction, with a view to avoiding significant harm that may occur in the environment of the adjacent area.

176. Austria and Yugoslavia concluded a Convention concerning water economy questions relating to the Drava in 1954 which provided that the upper riparian State, Austria, if it seriously contemplated new works which would divert more water from the Drava, or which would affect the river to the detriment of Yugoslavia, undertook to discuss such plans with Yugoslavia "prior to legal negotiations concerning rights in the water".[320]

177. The requirements embraced within "notification" were spelled out in considerable detail by Denmark and Germany in their 1922 Agreement:

Article 31

Contents of notifications

Notifications shall state where the drawings and explanations which have been submitted may be inspected, and shall mention the authorities to which objections to the authorization and also applications for the erection and upkeep of installations for the prevention of damage, or applications for compensation shall be addressed in writing or be made orally in official form. A time limit shall also be fixed for lodging objections or making applications. The period

[314] Organization of American States, *Rios y lagos internacionales* . . ., pp. 111–112. However, it appears that arts. 2 and 3 were intended primarily for contiguous rivers, art. 4 providing: "The same principles shall be applied to successive rivers . . ." (*ibid.*, p. 112). Art. 10 carries the message of urgency further, allowing the parties one month to accept or reject the conciliation finding before proceeding to arbitration "at the request of the interested parties", in accordance with the procedure provided by the Second Hague Convention (*ibid.*, p. 113).

[315] Recommendation C(74)224 of 14 November 1974 (OECD, *OECD and the Environment* (Paris, 1979), pp. 110–111, annex, title E).

[316] *International Legal Materials*, vol. XIV, No. 3, 1975, p. 589. The Agreement entered into force on 26 March 1975.

[317] This is in addition to the exchange of information pursuant to art. II.

[318] Proposition X (Asian-African Legal Consultative Committee, *Report of the Fourteenth Session (op. cit.)*, p. 107).

[319] Recommendation 51 (*b*) (i) (*Report of the United Nations Conference on the Human Environment* . . ., p. 17).

[320] Art. 4 (United Nations, *Treaty Series*, vol. 227, p. 132). The article provided further that, if no agreed settlement could be reached from direct discussions or within the Joint Drava Commission set up by the Conference, the matter was to be referred to the court of arbitration (also provided for) for decision.

allowed shall be not less than two, and not more than six weeks. It shall begin to run from the day following that upon which the gazette containing the final notification is published.

It shall be stated in the notification that all persons who have not lodged any objection or made any application within the time limit fixed shall lose their rights in that connection, but that applications for the erection and upkeep of installations or for compensation may be made at a later date if they are based upon damage which could not be foreseen during the period covered by the time limit.

Even after the expiration of the appointed time, a person who has suffered damage shall not be debarred from submitting a claim provided he can show that he was prevented by circumstances over which he had no control from submitting such claim within the time limit.

The right establishing claims after the expiration of the appointed time is subject to prescription three years after the date on which the person who suffered damage learned of the existence of such damage.

. . .

A suitable additional period may be allowed for the production of evidence.[321]

178. In the General Convention for the development of hydraulic power affecting more than one State, which came out of the Second General Conference on Communications and Transit, held in Geneva in 1923, article 4 provides another early precedent:

If a contracting State desires to carry out operations for the development of hydraulic power which might cause serious prejudice to any other contracting State, the States concerned shall enter into negotiations with a view to the conclusion of agreements which will allow such operations to be executed.[322]

179. The former chairman of the International Joint Commission, Canadian Section, reviewing the lessons "of considerable importance" from the Canada–United States experience, heads his list with this statement:

First, it is quite impossible to have satisfactory co-riparian relationships without the concerned parties being obliged by custom or practice to consult with the others before any plans are undertaken in the private or public sector which may have transboundary water quality or water quantity, or general environmental, effects on other members of the river basin family. Prior consultation is, therefore, of the essence and due notice and consultation becomes a prerequisite for sound relations.[323]

180. The 1975 Statute of the Uruguay River, adopted by Uruguay and Argentina, contains six articles on these procedural aspects of the topic that are worthy of study, even though in this case, as in many others, the parties formed a joint commission to administer their pertinent relations:

Article 7

A party planning the construction of new channels, the substantial modification or alteration to existing ones, or the execution of any other works of such magnitude as to affect navigation, the régime of the river or the quality of its waters, shall so inform the Commission, which shall determine expeditiously, and within a maximum period of 30 days, whether the project may cause appreciable harm to the other party.

If it is determined that such is the case, or if no decision is reached on the subject, the party concerned shall, through the Commission, notify the other party of its project.

The notification shall give an account of the main aspects of the project and, as appropriate, its mode of operation and such other technical data as may enable the notified party to assess the probable effect of the project on navigation or on the régime of the river or the quality of its waters.

Article 8

The notified party be allowed a period of 180 days in which to evaluate the project, from the date on which its delegation to the Commission receives the notification.

If the documentation referred to in article 7 is incomplete, the notified party shall be allowed a period of 30 days in which, through the Commission, so to inform the party planning to execute the project.

The aforementioned period of 180 days shall begin to run from the date on which the delegation of the notified party receives complete documentation.

This period may be extended by the Commission, at its discretion, if the complexity of the project so requires.

Article 9

If the notified party presents no objections or does not reply within the period specified in article 8, the other party may execute or authorize the execution of the planned project.

Article 10

The notified party shall have the right to inspect the works in progress in order to determine whether they are being carried out in accordance with the project submitted.

Article 11

If the notified party concludes that the execution of the works or the mode of operation may cause appreciable harm to navigation or to the régime of the river or the quality of its waters, it shall so inform the other party, through the Commission, within the period of 180 days specified in article 8.

Its communication shall state which aspects of the works or of the mode of operation may cause appreciable harm to navigation or to the regime of the river or the quality of its waters, the technical grounds for that conclusion and suggested changes in the project or the mode of operation.

Article 12

If the parties fail to reach agreement within 180 days of the date of the communication referred to in article 11, the procedure indicated in chapter XV shall be followed.[324]

181. The ECE Committee on Electric Power adopted, in 1954, a revised version of its earlier "recommendation No. 3", addressed to the matter at hand:

Recommends that a State proposing to embark within its own territory on projects likely to have serious repercussions on the territory of other States, whether upstream or downstream, should first communicate to the States concerned such information as would enlighten them as to the nature of those repercussions;

Recommends that, in the event of objections being raised by the States concerned following such prior notification, the State proposing to embark on the projects should endeavour, by negotiations with

[321] League of Nations, *Treaty Series*, vol. X, pp. 217–219. This Agreement created a Frontier Water Commission (with appeal provided to a Supreme Frontier Water Commission) and contemplated applications, and objections, from individual users of the international watercourse.

[322] *Ibid.*, vol. XXXVI, p. 81.

[323] Cohen, *loc. cit.*, p. 126.

[324] *Actos internacionales Uruguay-Argentina, 1830–1980 (op. cit.)*, pp. 594–596. Chap. XV of the 1975 Agreement (art. 60) treats of "Judicial settlement of disputes"; chap. XIV (arts. 58 and 59) provides for a conciliation procedure (*ibid.*, pp. 606–607). The same system States had adopted similar prior notification and consultation obligations (arts. 17–22, in chap. II, on navigation and facilities) in their 1973 Treaty concerning the La Plata River (*International Legal Materials*, vol. XIII, No. 2, 1974, pp. 254–255). In addition, art. 50 provided for a pledge by the parties "to inform each other as to any norms they anticipate may be adopted with reference to water pollution"; art. 51 provided: "Each party shall be liable to the other for detriment suffered as a consequence of pollution caused by their operations, or by those of physical or corporate persons domiciled on their soil" (*ibid.*, p. 260). Chap. XIII of the 1973 Treaty set up a procedure for conciliation whereby, at the request of either party, "the Administrative Commission shall take cognizance over any dispute arising between the parties with reference to the La Plata River" (art. 68) (*ibid.*, p. 262). See also *Yearbook . . . 1974*, vol. II (Part Two), pp. 298–300, document A/CN.4/274, paras. 115–130.

those States, to reach an agreement such as will ensure the most economic development of the river system.[325]

182. The final report (1978) of the Intergovernmental Working Group of Experts on Natural Resources Shared by Two or More States contains several pertinent draft principles:

Principle 5

States sharing a natural resource should, to the extent practicable, exchange information and engage in consultations on a regular basis on its environmental aspects.

Principle 6

1. It is necessary for every State sharing a natural resource with one or more other States:

(*a*) to notify in advance the other State or States of the pertinent details of plans to initiate, or make a change in, the conservation or utilization of the resource which can reasonably be expected to affect significantly the environment of the other State or States; and

(*b*) upon request of the other State or States, to enter into consultations concerning the above-mentioned plans; and

(*c*) to provide, upon request to that effect by the other State or States, specific additional pertinent information concerning such plans; and

(*d*) if there has been no advance notification as envisaged in sub-paragraph (*a*) above, to enter into consultations about such plans upon request of the other State or States.

2. In cases where the transmission of certain information is prevented by national legislation or international conventions, the State or States withholding such information shall nevertheless, on the basis, in particular, of the principle of good faith and in the spirit of good neighbourliness, co-operate with the other interested State or States with the aim of finding a satisfactory solution.

Principle 7

Exchange of information, notification, consultations and other forms of co-operation regarding shared natural resources are carried out on the basis of the principle of good faith and in the spirit of good neighbourliness and in such a way as to avoid any unreasonable delays either in the forms of co-operation or in carrying out development or conservation projects.

. . .

Principle 11

1. The relevant provisions of the Charter of the United Nations and of the Declaration of Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations apply to the settlement of environmental disputes arising out of the conservation or utilization of shared natural resources.

2. In case negotiations or other non-binding means have failed to settle a dispute within a reasonable time, it is necessary for States to submit the dispute to an appropriate settlement procedure which is mutually agreed by them, preferably in advance. The procedure should be speedy, effective and binding.

3. It is necessary for the States parties to such a dispute to refrain from any action which may aggravate the situation with respect to the environment to the extent of creating an obstacle to the amicable settlement of the dispute.[326]

183. It may be noted that the Brazil–Paraguay Treaty for hydro-electric development of the water resources of the Paraná River, concluded in 1973, provides in article XXII that any disagreement over the interpretation or implementation of the Treaty and its annexes shall be settled "with no resultant delay or interruption in the construction and/or operation of the hydroelectric utilization scheme and of its auxiliary works and facilities".[327]

184. Incidents of damage, inequitable advantage and deprivation of benefits should of course be avoided. Active co-operation and collaboration between or among system States not only may forestall breach by any one of them of their duties under general and conventional international law but also are most conducive to the policy objectives of rational and optimum development, use and protection of an international watercourse system. Ample agreement accompanied by an integrated approach to management of shared water resources has been found to be the best combination of arrangements for development of critical or intensively used watercourse systems. Twenty years ago, in 1961, at its Salzburg session, the Institute of International Law clearly appreciated the by then heightened significance of interstate collaboration in this field. The preamble to its resolution, "Utilization of non-maritime international waters (except for navigation)" reads as follows:

The Institute of International Law,

Considering that the econmic importance of the use of waters is transformed by modern technology and that the application of modern technology to the waters of a hydrographic basin which includes the territory of several States affects in general all these States, and renders necessary its restatement in juridical terms,

Considering that the maximum utilization of available natural resources is a matter of common interest,

Considering that the obligation not to cause unlawful harm to others is one of the basic general principles governing neighbourly relations,

Considering that this principle is also applicable to relations arising from different utilizations of waters,

Considering that in the utilization of waters of interest to several States, each of them can obtain, by consultation, by plans established in common and by reciprocal concessions, the advantages of a more rational exploitation of a natural resource,

Recognizes the existence in international law of the following rules, and formulates the following recommendations:[328]

185. Pakistan and India, in their 1960 Indus Waters Treaty, recognized "that they have a common interest in the optimum development of the rivers," and to that end they declared "their intention to co-operate, by mutual agreement, to the fullest possible extent".[329]

186. Ideal arrangements, however, often cannot be realized, at least initially. It is necessary, therefore, to engender essential respect for the interests of other States by establishing minimum standards of behaviour. This is, it may be said, the function of general rules of international law at large; the field of shared water resources is no exception. Consequently it is submitted that it becomes necessary to include provisions in the Commission's draft articles on this topic

[325] E/ECE/EP/147. The earlier (1953) recommendation No. 3 had two clauses that were replaced by the second paragraph quoted above; those clauses read as follows: "Recognizes that such notification would be calculated to permit the opening of negotiations between the parties"; and "Recognizes, further, that this prior notification would be in keeping with accepted standards of international courtesy and in the interests of the harmonious hydro-electric development of successive rivers in Europe" (E/ECE/EP/135).

[326] UNEP/IG.12/2, annexed to document UNEP/GC.16/17.

[327] United Nations *Treaty Series*, vol. 923, p. 96.

[328] *Annuaire de l'Institut de droit international, 1961*, vol. 49, Part Two, pp. 381–382. See also United Nations, *Management of International Water Resources . . .*, pp. 174–181, paras. 553–585.

[329] Art. VII, para. (1) (United Nations, *Treaty Series*, vol. 419, p. 144). The paragraph proceeds to detail particular areas of co-operation. See also *Yearbook . . . 1974*, vol. II (Part Two), p. 102, document A/5409, para. 361 (*p*).

that prescribe clearly a system State's appropriate behaviour and yet respond to situations where the conduct of a system State is or may become inappropriate under residual principles and rules of international law, fixing State responsibility and specifying procedures that permit system States to avert imposition of such responsibility. To meet these objectives, an article assigning responsibility, under certain circumstances, for appreciable harm, is believed central to the Commission's work. In the light of these considerations, the foregoing article has been proposed for the consideration of a successor Special Rapporteur and of the Commission.

E. Information and data

187. In addition to the technical information and data pertaining to any specific project or programme that may cause appreciable harm to another system State, there is a recognized need for exchange of broader information and data on a regular basis in order that the system States may continually analyse the conditions in the international watercourse system, formulate their plans and adjust their activities in light of the performance of the system and their knowledge of the needs of their peoples and of their economies.

1. Prior consideration of the subtopic

188. In the Special Rapporteur's first report, an entire chapter was devoted to "Regulation of data collection and exchange".[330] The obligations under the three somewhat exacting articles, submitted for purposes of preliminary discussion only, may have responded to the technical need but have now been put aside as apparently exceeding at this time the necessary degree of acceptance within the Commission and the Sixth Committee of the General Assembly.[331] Yet the relative scarcity of comment in the Sixth Committee, particularly in light of the detailed treatment and considerable emphasis placed upon the matter in the report of the Special Rapporteur, allows the inference that there is recognition at least of the basic principle that information and data collection and exchange are essential to rational use of shared water resources, and thus should find expression in some form in the Commission's articles.[332]

189. The single article on "Collection and exchange of information" offered in the Special Rapporteur's second report[333] was couched in most general terms in the light of the criticisms received during the thirty-first session of the Commission.[334] Although an article dealing with information and data collection and exchange was predominantly accepted within the Commission, discussion at the thirty-second session centred on other aspects of the report, depriving this particular draft article of close scrutiny.[335] In turn, the Commission's Drafting Committee felt that adequate consideration could not be given by it to the matter in the time then available. Consequently the article on information and data was left aside at the Commission's thirty-second session.[336]

190. Reflecting on the importance placed on the matter by all water resources specialists, and bearing in mind the possible burdens and sensitivities involved for some States, the Special Rapporteur has made a third effort to devise a meaningful article on information and data. Undoubtedly there are still some minor international watercourse systems that are so little used as to preclude a present need for data or information from other system States; yet the time may well come when one or more system States will include those increasingly precious water resources in their development planning, or when new uses or flooding, for example, have become significant. Moreover, system States cannot soundly ascertain the value of such undeveloped shared water resources unless and until they have in hand at least preliminary survey studies, which in turn cannot be prepared properly without basic data, much of which need to be system-wide.

191. The Commission's article should anticipate such changed circumstances and provide for the initiation of information and data exchange as and when needed. To be sure, information and data may, at least for the time being, be required on some aspects of the uses of water resources or behaviour relating thereto, but not on others. Failing express agreement, a system State should not be put to the expense and trouble of providing information or data that are not in fact going to be useful to the receiving system States. On the other hand, a system State should not be denied information about a shared water resource, necessary or useful to its assessments and planning, simply because it can be obtainable only from a co-system State or by joint effort. Real problems of cost and capability, as well, at times, even of national security, need to be faced in this area of international interrelationship and co-operation.

192. The situation is not uncommon that one system State requires, requests and expects information or data from a co-system State that does not stand in need of information or data from the requesting system State. The frustrations and dissatisfactions inherent in situations where perceived need is not reciprocal can readily be imagined.[337] Thus the Commission's article must endeavour to respond to the needs of all countries and facilitate the requisite co-operation between and among system States in the interest of each individual country's economic and social development. And this must be done without imposing onerous burdens on others.

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[330] *Yearbook . . . 1979*, vol. II (Part One), pp. 171–177, document A/CN.4/320, paras. 111–136, and examples and studies there cited.

[331] See the Special Rapporteur's appraisal of comment on that first effort in his second report (*Yearbook . . . 1980*, vol. II (Part One), pp. 178–179, document A/CN.4/332 and Add.1, paras. 126–130).

[332] *Ibid.*, p. 179, para. 129; see also *Yearbook . . . 1980*, vol. I, p. 151, 1612th meeting, para. 13.

[333] *Yearbook . . . 1980*, vol. II (Part One), p. 179, document A/CN.4/332 and Add.1, para. 130.

[334] See *Yearbook . . . 1979*, vol. II (Part Two), p. 168, para. 142.

[335] But see *Yearbook . . . 1980*, vol. I, p. 130, 1608th meeting, para. 7 (Mr. Sucharitkul), and p. 144, 1610th meeting, para. 36 (Mr. Jagota).

[336] *Yearbook . . . 1980*, vol. II (Part Two), p. 108, para. 87. For the Special Rapporteur's submission to the Commission on that point in paras. 124–139 of his second report, (*Yearbook . . . 1980*, vol. II (Part One), pp. 178–180, document A/CN.4/332 and Add.1).

[337] This problem received considerable attention at the 1981 Dakar Interregional Meeting of international river organizations (United Nations, *Experiences in the Development and Management . . .*, p. 13, para. 45).

2. Recent expert testimony, official and unofficial

193. A "significant finding" of the United Nations Interregional Seminar on River Basin and Interbasin Development, held in Budapest in 1975, was that

> . . . often the process of national or international river basin and interbasin development is greatly facilitated if the technical facts are established in an objective manner prior to discussions at the political and policy levels between countries . . . The facts speak for themselves and provide persuasive evidence of the possible benefits and lines of development. The seminar attached highest importance to the establishment of suitable organizational entities to gather, analyse and interpret data. In some cases, the *ad hoc* arrangements of establishing fact-finding committees has been followed. A series of task forces may be organized, or technical centres or institutes supported by co-basin partners may be considered.[338]

194. One contributor at that Seminar postulates:

> An efficient system of hydrological data collection is the basic criterion for water management to meet its responsibilities . . .
>
> Accordingly, the process of data collection and processing is extended through the data transmission system to the decision, of which it forms the objective basis. In the absence of reliable records, water management decisions may become biased by personal influences and misjudgment may lead to unfounded decisions . . .[339]

The same author drew these pertinent conclusions:

> 1. Optimal water management decisions can be made only on the basis of observation data from the optimal hydrological network.
>
> . . .
>
> 3. No optimal network can be developed unless the data from the so-called "minimal network" are available, which present a picture about the time and space variability of hydrological phenomena.
>
> . . .
>
> 7. In the observation systems on international catchments, hydrological information may be required for water management decisions from the territory of the neighbouring countries . . .[340]

195. In "A review of some hydrological studies required in the design of water management projects", WMO made the following statements relevant to this matter:

> 1. Hydrological and related meteorological data are collected, in the main, to provide information for development and managing the water resources of a country. They are also used for operating purposes: forecasting flood discharges or stages, low flows, monthy and, in some cases, yearly discharges, for operation of reservoirs and hydro-electric plants, etc. Finally, they also serve research.
>
> It is important to establish the various networks on an integrated basis . . . For international basins, good co-operation is necessary not only between the agencies in one country but also between such agencies of the countries sharing the basin.
>
> . . .
>
> 2. Common hydrologic data usually required for various hydrological purposes are listed below:
>
> a. Annual and seasonal volume of streamflow
> b. Mean daily discharge distribution
> c. Low-flow frequency
> d. Frequency of high discharges
> e. Frequency of large-volume floods
> f. Shape of flood hydrograph
> g. Ice cover distribution
> h. Sediment transportation
> i. Chemical quality of the water
> j. Precipitation distribution
> k. Evaporation distribution[341]

196. The water resources development objectives of Bangladesh, which forms part of three international watercourse systems, provide representative illustrations of the purposes to which such data and information are put, especially by developing countries:

> (*a*) to confine river flows to stable and fixed beds at all stages of discharge through embankments and river training;
>
> (*b*) to control water flows from river to land;
>
> (*c*) to ensure drainage of water from the land into the river;
>
> (*d*) to provide irrigation by the co-ordinated use of surface and groundwater to the maximum extent;
>
> (*e*) to prevent flooding from the sea through coastal embankments and estuary closures;
>
> (*f*) to generate hydro-power where feasible; and
>
> (*g*) to improve river channels for navigation and provide regulated navigation routes.[342]

197. The Sudanese hydraulic engineer who later served as the Secretary-General of the United Nations Water Conference has written the following of special relevance to contemporary use of data:

> The integrated river basin approach has become possible as a result of developments in aeronautics, aerial survey, geophysics, mathematical models and computers; and, most essentially, because of the availability of the basic physical data accumulated accurately over a long period of time . . .
>
> Integrated river basin development, in addition to the evaluation of water resources, requires the surveying of all the natural resources of the basin, the land resources, human resources, animal resources; and the economic, social and environmental conditions. Among all these fields, the evaluation of the water, being a mobile resource, is the most difficult and complex . . . Therefore, the evaluation of the water resources of a basin requires strong and very well equipped institutions which possess the technology, the trained and experienced personnel and the adequate, accurate basic data necessary for rational development . . .
>
> The problem becomes more complex when the river is a multinational resource. In most of such basins, co-operation among the basin States is fully realized. However, in major basins which traverse different geographical and climatological zones, different traditions and habits of basin populations, needs and priorities for development plans, diverse water institutions and know-how all have an impact on the activities of the basin countries towards the integrated river basin approach . . .[343]

198. At the most important and all-embracing world-wide intergovernmental meeting on water resources, the very first set of recommendations arrived at and

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[338] Recommendation 2 of the Seminar held from 16 to 26 September 1975 in Budapest, in co-operation with UNDP and the National Water Authority of Hungary (*River Basin Development: Policies and Planning: Proceedings of the United Nations Interregional Seminar on "River Basin and Interbasin Development"*, United Nations publication, Sales No. E.77.II.A.4), vol. I, p. 20.

[339] O. Starosolszky, "Hydrometrical tasks establishing the decision-making on river basin development" (*ibid.*, p. 174).

[340] *Ibid.*, p. 179.

[341] *Ibid.*, pp. 180–181. See also L. Lukács, "International co-operation in water management research" (*ibid.*, vol. II, pp. 92–98); B. Binson, "Views on river basin development in Thailand" (*ibid.*, especially p. 184); S. N. Gupta, "Brahmaputra river basin development: a case study" (*ibid.*, especially p. 215).

[342] B. M. Abbas, "River basin development for socio-economic growth: Bangladesh" (*ibid.*, p. 190). The three international watercourses are the Brahmaputra, the Ganges and the Meghna. Cf. the "water control" objectives for the Vistula: "(*a*) Water-supply to population, agriculture and industry; (*b*) Maintenance of the minimum acceptable flows (established after a detailed study . . .); (*c*) Water pollution control; (*d*) Flood control; (*e*) Development of recreational facilities; (*f*) Development of hydro-power production and inland navigation . . .", as listed by J. Kindler, "Vistula river basin development: a case study" (*ibid.*, p. 282).

[343] Y. A. Mageed, "Problems encountered in integrated river basin development: case study of the River Nile" (*ibid.*, p. 17).

adopted dealt with data and information.[344] These recommendations, which *inter alia* call for countries to co-operate "in the co-ordination, collection and exchange of relevant data in the case of shared resources",[345] read in part:

A. *Assessment of water resources*

1. In most countries there are serious inadequacies in the availability of data on water resources, particularly in relation to groundwater and water quality. Hitherto, relatively little importance has been attached to its systematic measurement. The processing and compilation of data have also been seriously neglected.

2. To improve the management of water resources, greater knowledge about their quantity and quality is needed. Regular and systematic collection of hydrometeorological, hydrological and hydrogeological data needs to be promoted and be accompanied by a system for processing quantitative and qualitative information for various types of water bodies. The data should be used to estimate available precipitation, surface water and groundwater resources and the potentials for augmenting these resources. Countries should review, strengthen and co-ordinate arrangements for the collection of basic data. Network densities should be improved; mechanisms for data collection, processing and publication and arrangement for monitoring water quality should be reinforced.

3. To this end, it is recommended that countries should:

(*a*) Establish a national body with comprehensive responsibilities for water-resources data, or allocate existing functions in a more co-ordinated way, and establish data banks for the systematic collection, processing, storage and dissemination of data in agreed formats and at specific intervals of time;

(*b*) Expand and extend the network of hydrological and meteorological stations, taking a long-term view of future needs . . ., and use existing meteorological and hydrological data series for the study of seasonal and annual fluctuations in climate and water resources . . .

(*c*) Establish observation networks and strengthen existing systems and facilities for measurements and recording fluctuations in groundwater quality and level; organize the collection of all existing data on groundwater (borehole logs, geological structure, and hydrogeological characteristics, etc.); systematically index such data, and attempt a quantitative assessment so as to determine the present status of and gaps in knowledge; increase the search for, and determination of, the variables of aquifers, with an evaluation of their potential and the possibilities of recharge;

(*d*) Standardize and organize as far as possible the processing and publication of data so as to keep the statistics up to date and take advantage of the observations made in stations operated by different institutions;

(*e*) Include consideration of diseases associated with water as an integral part of water assessments and the consideration of the interrelationships of water quality, quantity and related land use;

(*f*) Make periodic assessments of surface and ground water resources, including rainfall, evaporation and run-off, lakes, lagoons, glaciers and snowfields, both for individual basins and at the national level, in order to determine a programme of investigation for the future in relation to developments needs; . . .

. . .

(*h*) Standardize measurement techniques and instruments, and automate stations as appropriate; . . .

(*i*) Support and promote national contributions to regional and international programmes on hydrological studies . . .;

. . .

(*n*) Develop methods for the estimation of available water resources using aerological observations for the computation of the atmospheric water budget in large river basins, rivers and continents;

(*o*) Provide for the studying and analysing of hydrological data on surface and ground water by multidisciplinary teams so as to make adequate information available for planning purposes;

(*p*) Include the development of forecasting methods in quantitative and qualitative assessment, especially in the developing countries;[346]

199. At the regional meetings held in Africa, Asia and the Pacific, Europe, Latin America and Western Asia[347] in preparation for the United Nations Water Conference, attention was also given to the fundamental need for information and scientific studies. For example, the Western Asia meeting recommended the formation of a water resources council for Western Asia to include at the outset, *inter alia*, a "task force on data collection networks".[348] The regional meeting for Europe focused particularly on international watercourse systems:

5. In the case of transboundary river basins, and other shared waters, the active co-operation of the riparian countries should be promoted, in particular in water pollution control . . .

6. Co-operation at the regional and international levels should be developed along the following guidelines:

(i) Exchange of scientific and technical information and documentation;

(ii) Review and analysis of the existing situation and prospects concerning the use of water resources, including:

Improving forecasting methods of hydrological régimes and exchanging forecasts on a regional scale;

Research into water resources in transboundary river and sea basins to estimate the effects of human activity factors on water régimes and quality;

Intensification of research and development applied to water management, including the design and demonstration of new systems and instruments for measuring and monitoring water quality and quantity . . . as well as low cost, easily maintained and reliable technologies for use by all nations, . . .[349]

200. The United Nations Water Conference devoted a special section of its recommendations to "Regional co-operation".[350] The first recommendation in that section states:

In the case of shared water resources, co-operative action should be taken to generate appropriate data on which future management be based . . .[351]

To this end, it is more specifically recommended that countries sharing a water resource should, *inter alia*:

(*b*) Establish joint committees, as appropriate with the agreement of the parties concerned, so as to provide for co-operation in areas such as the collection, standardization and exchange of data . . .;

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[344] *Report of the United Nations Water Conference* . . ., pp. 7–10.

[345] Recommendation 3 (*j*) (*ibid.*, p. 8).

[346] *Ibid.*, pp. 7–9. See also resolution I of the Conference ("Assessment of water resources") (*ibid.*, p. 66). The Second International Conference on Water Law and Administration of the International Association for Water Law (Caracas, 1976), designated as a technical preparatory conference for the United Nations Water Conference, adopted, *inter alia*, a recommendation that international organizations: "Make every effort to support the creation of the appropriate legal régimes and institutional machinery for the effective realization of the required multidisciplinary data base with respect to water resources" (recommendation 48 (*a*)) (International Association for Water Law, *Annales Juris Aquarum-II*, vol. 1, 1976, p. clxiii). Another recommendation, addressed to Governments "in the cases where they share international basins", urged the establishment of "mechanisms for co-operation" to include "the need to exchange information among interested States with respect to the projects and activities that may cause pollution or other harmful effects in another State" (*ibid.*, p. clxiv).

[347] See e.g. the recommendations put forward by these regional meetings, consolidated in the annex to *Report of the United Nations Water Conference* . . ., pp. 59–65.

[348] *Ibid.*, pp. 63–64.

[349] *Ibid.*, p. 60.

[350] *Ibid.*, pp. 51–52, paras. 84–89.

[351] *Ibid.*, p. 51, para. 84.

. . .

(*f*) Institute action for undertaking surveys of shared water resources and monitoring their quality;"

(*g*) In the absence of an agreement on the manner in which shared water resources should be utilized, countries which share these resources should exchange relevant information on which their future management can be based in order to avoid forseeable damages;[352]

201. More recently, at the Interregional Meeting of International River Organizations, held under United Nations auspices, in Dakar, Senegal, 5–14 May 1981,[353] pursuant to resolution VII of the Mar del Plata Action Plan,[354] subsequently endorsed by the Economic and Social Council (resolution 2121 (LXIII) of 4 August 1977), several of the conclusions call for the collection and exchange of data expressly, or embrace the need as self-evident in a larger context of optimum development, use or protection of shared water resources. The principal conclusion addressed to this concern appears under topic II, "Progress in co-operative arrangements":

An adequate and reliable data base is deemed indispensable to rational planning and project and programme execution. Since data gathering, processing and dissemination for complex shared water resources systems is costly and is a continuous process, it is more than normally important that the system States agree quite specifically on the kinds of data needed for different purposes, and on the scheme for their collection. With respect to the basic hydrologic data and operational information, however, a free and ample flow on a timely basis is called for at all times.[355]

202. Another of the conclusions, regarding pollution, public health and the environment, also recognizes this need:

Water quality, water-related disease and environmental protection considerations have to date received inadequate attention in most cases, and Governments need to request their river and lake organizations to include these aspects as part of their information and data, project and programme planning or monitoring functions, as appropriate.[356]

203. Considerable attention was devoted to shared groundwater, with the following as one of the conclusions:

Those co-operating States that have not yet included groundwater as a part of the shared water resources system need to recognize this part of the hydrologic cycle as intimately linked to the quantity and quality of their shared surface waters, and could entrust their international river and lake organizations with the task to initiate technical studies and to call for hydrogeologic data. Concerned Governments may thus apprise themselves of the specifics of the interactions throughout the system, or portion thereof, with a view to benefiting from conjuctive use and to adopting the indicated conservation and protection measures for the underground environment.[357]

204. Under topic III, "Economic and other considerations", agreement was expressed "on steps or stages of co-operation, from the initial conversations through preliminary fact-finding, sound data collection, prefeasibility and feasibility studies, planning, design, construction, operation and maintenance".[358] Though it was noted that some aspects regarding joint studies and exchange of information had already been covered under topics I and II, this additional statement was entered:

. . . Information exchange was considered a prerequisite to basin-wide planning and to the establishment of useful co-operative arrangements for the many basin issues that arise. Joint studies, it was pointed out, could produce information fully acceptable to participating Governments, and could save time and money. Various types of exchanges were considered among basin States; between the latter and such river basin commission as they may establish; and among international river basin commissions through the United Nations acting as a clearing house. Some emphasis was put on systematic, continuous exchange as distinct from sporadic efforts.[359]

205. The technical experts in water resources have repeatedly espoused the application of modern, multidisciplinary techniques of analysis, especially where an international watercourse is subjected to multiple use or where future development plans depend upon water, as most do. The developing countries, most of which must maximize their available resources and achieve efficacious marshalling of their efforts, may find, with assistance as required, that methods such as systems analysis will allow them to make better judgments with insufficient data than otherwise would be the case. No known data base for a watercourse system has ever been complete and entirely current even in the most advanced situations. Many social and economic development decisions cannot be held up indefinitely while the "full" data base is being accumulated; it is

[352] *Ibid.*, pp. 51–52, para. 86. It should be noted that the text of subparagraph (*g*) quoted above was submitted to a roll-call vote in the plenary of the Conference; it was adopted by 29 votes to 13, with 48 abstentions (*ibid.*, p. 126, para. 162). The other parts of the recommendations quoted above were adopted without a vote. Other groups of recommendations adopted at the Conference return again and again to the need for data and information exchange, systems analysis and research studies. See e.g. under heading B ("Water use and efficiency"), paragraphs 8(*a*), 10(*b*), (*c*), (*d*), (*e*) and (*g*), 11, 12, 13, 19(*b*), 23(*b*), 26(*a*) and (*b*), 27(i) and (iv), 29(*a*), (*b*), (*f*) and (*g*), 32(*a*) and (*c*) (*ibid.*, pp. 11–23); under heading C ("Environment, health and pollution control"), paragraphs 36(*b*), (*c*), (*d*), (*e*), (*f*), (*k*), (*o*) and (*p*), and 39(*a*), (*b*), (*f*), (*h*), (*j*), (*k*), (*s*), (*u*) and (*v*) (*ibid.*, pp. 25–29); under heading D ("Policy, planning and management"), paragraphs 41 and 44(*d*), (*f*), (*g*) and (*h*) (*ibid.*, pp. 30–31); under heading E ("Natural hazards"), paragraphs 65(*c*) and (*d*), 67 and 68(*a*), (*b*), (*d*), (*e*), (*j*) and (*n*) (*ibid.*, pp. 40–41); under heading F ("Public information, education, training and research"), paragraphs 81 and 82(*d*), (*f*), (*g*), (*h*) and (*i*) (*ibid.*, pp. 47–49). Many, if not most, of the recommendations of the Conference presume the creation and maintenance of the pertinent data bases upon the analysis of which policy and management decisions are to be founded.

[353] For the report of the meeting, see United Nations, *Experiences in the Development and Management . . .*, pp. 3–41.

[354] *Report of the United Nations Water Conference . . .*, p. 77.

[355] United Nations, *Experiences in the Development and Management . . .*, p. 15, para. 49, conclusion 11.

[356] *Ibid.*, p. 14, para. 49, conclusion 4.

[357] *Ibid.*, conclusion 6.

[358] *Ibid.*, p. 17, para. 58.

[359] *Ibid.*, p. 18, para. 64. These sentiments were condensed as conclusion 7 under topic III (*ibid.*, p. 20, para. 69). In addition, see conclusion 5 concerning prevention and mitigation of floods, droughts and other hazards under topic II (*ibid.*, p. 14, para. 49). In the course of the general debate and working group sessions it was generally recognized that there should be some data and information exchange, notably as an aspect of equitable utilization. However, there were differences with respect to the source and scope of the obligation. The need for sharpening means and criteria for data gathering was emphasized, especially in the case of developing countries, which would necessitate technical and financial assistance (*ibid.*, p. 13, para. 45). In presenting topic II, the rapporteur reiterated the call "for the collection and sharing of information and data on a timely basis and in accordance with an agreed scheme tailored to meet the needs of the system States individually and collectively in the future. The indispensability of a proper and reliable data base was stressed; the undertaking of at least some kinds of data gathering, collation and analysis as a joint effort under some circumstances was posed as a technique to be discussed; the general acceptability to all parties of data so generated and the assurance of compatibility if not uniformity for analysis were noted" (*ibid.*, p. 11, para. 33). See also Hayton, "Progress in co-operative arrangements", background paper for topic II (*ibid.*, p. 65), and documents and works there cited.

also too expensive to attempt all-embracing data collection, collation, analysis and dissemination, even for developed countries.[360] Information and data are essential. Properly selected data, collected reliably and processed and exchanged promptly can yield sound understanding and forecasts at least adequate to the appointed tasks. The pooling of information and data, in compatible form, by the system States on a regular basis, and above all when one or more of the countries determines a need, is indispensable to the accumulation of that essential, minimum body of knowledge allowing development, use and protection of water undertakings to proceed with some confidence.[361]

206. At the United Nations Water Conference, special attention was devoted to this aspect of methodology. One set of recommendations, concerned with efficiency at the regional, national and farm level, stated that "systems analysis and modelling techniques should be applied to improve efficiency and efficacy in storage operation and distribution systems".[362] Another proposition endorsed at the Conference reads in part as follows:

> In particular, the construction of new works should be preceded by a detailed study of the agricultural, industrial, municipal and hydropower needs of the area concerned. Water management plans may be prepared using systems analysis techniques and developed on the basis of already adopted indicators and criteria. This analysis would take into account the economic and social evolution of the basin and be as comprehensive as possible; it would include such elements as time horizon and territorial extent, and take into account interactions between the national economy and regional development . . .[363]

In implementation of the national strategies recommended, the Conference spelled out a number of things that countries should do, including those pertinent to information and data:

> (*d*) Improve the availability and quality of necessary basic information, e.g. cartographic services, hydrometry, data on water-linked natural resources and ecosystems, inventories of possible works, water demand projections and social cost;
>
> . . .
>
> (*f*) Develop and apply techniques for identifying, measuring and presenting the economic, environmental and social benefits and costs of development projects and proposals . . .;
>
> . . .
>
> (*h*) Formulate master plans for countries and river basins to provide a long-term perspective for planning, including resource conservation, using such techniques as systems analysis and mathematical modelling . . .[364]

207. While it is not proposed that international law should require application of such techniques, it is important to realize that pursuit of the water development and conservation objectives of Governments will probably involve these methods. Information and data must be "fed into" these models in order that a result be produced. "International co-operation for development is the shared goal and common duty of all States" declares the Charter of Economic Rights and Duties of States.[365] The sharing of data and information, and the formulation by system States of compatible data collection and collation, if not uniformity of analysis and dissemination formats, is becoming increasingly inescapable. The Commission's article on this subject should not lag far behind the exigencies of shared water resources development, use and protection. At the very least, the residual rule should facilitate and not obstruct the collection and sharing of information and data of a fundamental nature and, upon a proper request, of a specialized nature. Costs may have to be borne "equitably", that is, in proportion to the benefit conferred by the supplying State upon system States utilizing the data, including itself, and in proportion to financial capability as well. There will be considerations, also, of technical capability; reciprocity and mutual assistance will undoubtedly figure heavily in the specific arrangements agreed upon. The function of the Commission's article is to provide the minimal point of departure for information and data sharing where the watercourse system is an international one.

208. The importance of a not too burdensome sharing was recognized by the International Law Association, which recommended in its Helsinki Rules that "each basin State furnish relevant and reasonably available information to the other basin States concerning the waters of a drainage basin within its territory and its use of and activities with respect to such waters . . ."[366] This sharing was there expressly cast, however, as an aid to preventing disputes rather than as an affirmative element in achieving more rational development, use and protection of the resource.[367] In the commentary to the article, this explanation is given with respect to the quoted passage:

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[360] See I. Bogárdi, "Uncertainty in water resources decision-making" (United Nations, *River Basin Development . . .*, vol. I, p. 188, and works there cited), and WMO, "River basin models and their application with scarcity of data" (*ibid.*, p. 132, and works there cited).

[361] See e.g. I. Dégen, "Integrated development of river basins: overview and perspectives" (*ibid.*, especially pp. 17–19, and works there cited); L. Dávid, "River basin development for socio-economic growth: general report" (*ibid.*, especially pp. 25 and 29, and works there cited); G. W. Reid and M. I. Muiga, "Aggregate modelling of water demands for developing countries utilizing socio-economic growth patterns" (*ibid.*, p. 77); D. G. Jamieson, "A hierarchical approach to the analysis of water resource systems" (*ibid.*, p. 123, and works there cited); B. W. Mar, "Systems approach to river basin and interbasin development" (*ibid.*, p. 155); L. Dávid and L. Duckstein, "Long-range planning of water resources: a multi-objective approach" (*ibid.*, p. 160, and works there cited); T. Scudder, "Social impacts of river basin development on local populations" (*ibid.*, p. 45, and works there cited); E. Plate, "Simulation as a tool in international river development" (*ibid.*, vol. II, p. 33); K. Chaemsaithong, "Multipurpose river project planning in the Lower Mekong basin: a decisional approach" (*ibid.*, p. 205; and works there cited); J. A. Dracup and A. P. Feldman, "Systems approach for the planning and management of the Morava river basin in Yugoslavia" (*ibid.*, p. 286). See also M. B. Fiering, "The role of systems analysis in water programme development", *Natural Resources Journal*, vol. 16, 1976, p. 759; C. W. Howe, "The effects of water resource development on economic growth" (*ibid.*, p. 939); A. K. Biswas, ed., *Systems Approach to Water Management* (New York, McGraw Hill, 1976); United Nations, *The Demand for Water: Procedures and Methodologies for Projecting Water Demands in the Context of Regional and National Planning*, Natural Resources/Water Series No. 3 (Sales No. E.76.II.A.1), especially pp. 22–23, and works there cited.

[362] *Report of the United Nations Water Conference . . .*, p. 12, para. 10(*c*).

[363] *Ibid.*, p. 30, para. 41.

[364] *Ibid.*, p. 31, para. 44. Although this section of recommendations was directed primarily to the national level, the implications for all watercourse systems, including international watercourse systems, is evident; moreover, the Conference frequently used the terms "river basin", "different countries", "subregions", etc., in its report without differentiation.

[365] General Assembly resolution 3281 (XXIX) of 12 December 1974.

[366] Art. XXIX, para. 1 (ILA, *Report of the Fifty-second Conference . . .*, p. 518.

[367] See the commentary to art. XXIX, para. 1: "The exchange of

The reference to "relevant and reasonably available information" makes it clear that the basin State in question cannot be called upon to furnish information which is not pertinent and cannot be put to the expense and trouble of securing statistics and other data which are not already at hand or readily obtainable. The provision of the article is not intended to prejudge the question whether a basin State may justifiably call upon another to furnish information which is not "reasonably available" if the first State is willing to bear the cost of securing the desired information.[368]

This final version in the Helsinki Rules derived from the agreed recommendations of the Association's "New York resolution" of 1958, which provided:

Co-riparian States should make available to the appropriate agencies of the United Nations and to one another hydrological, meteorological and economic information, particularly as to stream-flow, quantity and quality of water, rain and snow fall, water tables and underground water movements.[369]

209. While the recent "Athens resolution" of the Institute of International Law does not address the entire gamut of information and data exchange, devoted as it is to pollution, it nonetheless includes a rule obliging States, at the international level, to co-operate "in good faith with the other States concerned".[370]

In carrying out their duty to co-operate, States bordering the same hydrographic basin shall, as far as practicable, especially through agreements, resort to the following ways of co-operation:

(*a*) inform co-riparian States regularly of all appropriate data on the pollution of the basin, its causes, its nature, the damage resulting from it and the preventive procedures;

(*b*) notify the States concerned in due time of any activities envisaged in their own territories which may involve the basin in a significant threat of transboundary pollution;

(*c*) promptly inform States that might be affected by a sudden increase in the level of transboundary pollution in the basin and take all appropriate steps to reduce the effects of any such increase;

(*d*) consult with each other on actual or potential problems of transboundary pollution of the basin so as to reach, by methods of their own choice, a solution consistent with the interests of the States concerned and with the protection of the environment;

(*e*) co-ordinate or pool their scientific and technical research programmes to combat pollution of the basin;

. . .

(*h*) establish harmonized, co-ordinated or unified networks for permanent observation and pollution control;[371]

210. Also focusing on transfrontier pollution, OECD has made much of the importance of information and data exchange in an active context of neighbourly consultation. A recent study by the OECD Environment Committee merits quotation in part:

5. *Information procedure* means the dissemination of various data and information on activities or measures, proposed activities or measures undertaken or envisaged in a country . . . Depending on the case, it may be followed *either on the initiative of the country originating the activity or measure concerned, or at the request of the country or countries exposed by this activity or measure* . . .

6. (*a*) It may take the form of the *ad hoc* provision of information regarding a specific activity or measure likely to cause a significant risk of transfrontier pollution.

. . .

(*b*) Alternatively the information procedure can take the form of the routine communication by any suitable means, notably within international commissions or organizations, of data concerning pertinent aspects of the environmental policy of the country providing the information when these might result in a problem of transfrontier pollution in the informed country. Such practices are clearly not merely *ad hoc, but form part of a general context of co-operation and concerted action between countries concerned to protect the same environment.* In this case *they cannot be unilateral*, but instead take the form of an exchange of relevant information and data. This makes clear the interrelation between information, concerted action and consultation.

7. The *consultation procedure* usually assumes that information has been disseminated or exchanged in advance . . .[372]

211. In 1977, the OECD Council adopted a recommendation on principles concerning transfrontier pollution, which included these statements:

11. Countries concerned should exchange all relevant scientific information and data on transfrontier pollution, when not prohibited by legislative provisions or prescriptions or by applicable international conventions. They should develop and adopt pollution measurement methods providing results which are compatible.

12. They should, when appropriate, co-operate in scientific and technical research programmes *inter alia* for identifying the origin and pathways of transfrontier pollution, any damage caused and the best methods of pollution prevention and control, and should share all information and data thus obtained.

They should, where necessary, consider setting up jointly, in zones affected by transfrontier pollution, a permanent monitoring system or network for assessing the levels of pollution and the effectiveness of measures taken by them to reduce pollution.[373]

212. In short, as another intergovernmental body has concluded: "States sharing a natural resource should, to the extent practicable, exchange information and engage in consultations on a regular basis on its environmental aspects."[374] The Commission's articles on the law of the non-navigational uses of international watercourses are by no means limited to environmental aspects, but the conclusion is applicable to other aspects of the problem as well. For example, the articles of the International Law Association on flood control give a partial list of co-operative activities by the basin States in that regard:

(*a*) collection and exchange of relevant data;

(*b*) preparation of surveys, investigations and studies and their mutual exchange;

(*c*) planning and designing of relevant measures;

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such information can play an important role in the composition of disputes which may actually turn on nothing more than a question of fact. Even in those instances in which a question of law is presented, the provision of information by one party to the other can bring into focus and clarify the legal issues in the case" (*ibid.*, p. 519). The article is, moreover, part of the chapter on "procedures for the prevention and settlement of disputes".

[368] *Ibid.*

[369] ILA, *Report of the Forty-eighth Conference* . . ., p. ix.

[370] Art. IV(*b*) of resolution II, entitled "The pollution of rivers and lakes and international law" (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 199).

[371] Art. VII, para. 1 (*ibid.*, p. 201). For "States bordering the same hydrographic basin", the French text, which is the authentic one, reads "les Etats faisant partie d'un même bassin fluvial ou lacustre".

[372] "Application of information and consultation practices for preventing transfrontier pollution", OECD, *Transfrontier Pollution and the Role of States" (op. cit.)*, p. 10. The OECD position has also been examined in sect. D above, on responsibility for appreciable harm.

[373] Title G, "Exchange of scientific information, monitoring measures and research", OECD, *Legal Aspects of Transfrontier Pollution (op. cit)*, p. 17.

[374] UNEP/IG.12/2, annexed to document UNEP/GC.6/17, principle 5. Principle 7 provides that:

"Exchange of information, notification, consultations and other forms of co-operation regarding shared natural resources are carried out on the basis of the principle of good faith and in the spirit of good neighbourliness and in such a way as to avoid any unreasonable delays either in the forms of co-operation or in carrying out development or conservation projects."

(*d*) operation and maintenance of works;

(*e*) flood forecasting and maintenance of works;

(*f*) flood forecasting and communication of flood warnings;

(*g*) setting up of a regular information service charged to transmit the height of water levels and the discharge quantities.[375]

213. Further, with respect to information and data, the same articles provide:

1. Basin States should communicate amongst themselves as soon as possible on any occasion such as heavy rainfalls, sudden melting of snow or on other events likely to create floods and of dangerous rises of water levels in their territory.

2. Basin States should set up an effective system of transmission in order to fulfil the provisions contained in paragraph 1, and should ensure priority to the communication of flood warnings in emergency cases . . .[376]

214. The Action Plan of the United Nations Environment Conference advised the Governments concerned to create appropriate machinery for co-operation with respect to water resources common to more than one jurisdiction:

Such arrangements, when deemed appropriate by the States concerned, will permit undertaking on a regional basis:

(i) Collection, analysis, and exchange of hydrologic data . . .;

(ii) Joint data-collection programmes to serve planning needs;

(iii) Assessment of environmental effects of existing water uses;

(iv) Joint study of the causes and symptoms of problems related to water resources, taking into account the technical, economic and social considerations of water quality control;[377]

215. These works and the earlier reports to the Commission on this question establish the crucial value of information and data with respect to the water resources and water-related activities of international watercourse systems. To summarize those findings: knowledge of the physical and chemical characteristics of the system, of the kinds and intensities of water uses, and of the demands that growth and development in the system States can be expected to make in the future—in terms of both quantity and quality—is fundamental to meaningful consultations and negotiations. Specific programmes or projects cannot be rationally considered or carried out without an adequate and reliable data base. It only remains to find the correct and acceptable formula for expressing such basic requirements as are, or ought to be, a part of the principles and rules of applicable international law. Properly stated, the Commission's article should, in addition, promote agreement between or among the system States with respect to the requirements of particular international watercourse systems.

216. It is understood that specific, detailed needs cannot be dealt with effectively except in system agreements. On the other hand, there are general requirements, perhaps including those of method, that the technical and scientific communities have long pleaded for.[378] The collection of data, to be useful, must be accomplished if not on a uniform then on a compatible basis; the collection plan must be systematic and include the essential elements, embracing the territorial reach relevant to the project, programme or overall development scheme, as appropriate. The content of the collection plan, the sophistication of the instrumentation for data gathering and the determinations as to cost sharing and implementation must, of course, be left to system agreements. Agreement is general, nonetheless, that in the absence of ample, accurate and verifiable information and data—either as a joint effort or on the basis of periodic exchange—the problems of international watercourse systems cannot be intelligently addressed.[379]

217. Once the data and information are in hand, their scientific collation and analysis must also be undertaken. Raw data are useless and often overwhelming.[380] System States might be wise to assign at least this aspect to a joint or international staff, but international law does not reach so far as a matter of obligation, unless a systems agreement so provides. The collated and analysed data covering a project, programme or watercourse system need also to be disseminated in timely fashion to the people at the technical and policy levels who are to use it.[381] Reliance upon inaccessable or out-of-date information and data may be, it could be argued, a more dangerous basis for decisions and investment of the countries' precious resources than acknowledged *lack* of sufficient and good information, which would at least give the planners and decision-makers pause. The Secretary-General's study of the issues before the Committee on Natural Resources of the Economic and

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[375] Art. 3 (ILA, *Report of the Fifty-fifth Conference . . .*, p. xvi).

[376] Art. 4 (*ibid.*). Art. 6, para. 1, states: "Expenses for collection and exchange of relevant data, for preparation of surveys, investigations and studies, for flood forecasting and communication of flood warnings, as well as for the setting up of a regular information service shall be borne jointly by the basin States co-operating in such matters" (*ibid.*, p. xvii).

[377] Recommendation 51(*c*) (*Report of the United Nations Conference on the Human Environment . . .*, p. 17).

[378] Concerning the preparation of a scheme for exchange of information and the gathering of basic data, a United Nations panel of experts concluded the following:

"The mere process of preparing and implementing such a scheme will afford practice in working together and tend to generate an atmosphere of collaboration. Then, in order to arrive at some indication of the extent of surveys necessary and the cost of various works, the technical characteristics of such works and their functions in the general scheme will have to be discussed. This discussion will include at least some of the following: flood control, river training, reservoirs, river gains and losses, silt charge, reclamation in the various aspects required, surface and subsoil conditions, drainage, farm-cropping patterns, irrigation layouts, hydro-electric installations, domestic water supply, fish life, sanitation (especially anti-malarial measures), soil erosion and pollution" (United Nations, *Integrated River Basin Development* (Sales No. E.70.II.A.4), p. 37).

As to the "reconnaissance of existing conditions":

"One of the most important evaluations to make is the adequacy of water supply in view of requirements for the whole broad range of water uses (for livestock, households, industry, navigation, power, sanitation, irrigation). In determining the annual water cycle it is essential to know not only the usual or average conditions but also the recurrent or random variations in the relation between supply and demand which create medium-term and long-term disequilibria. Storage facilities may have to be included in the plan for the purpose of extending the period over which there is equilibrium between supply and need. Storage which changes the incidence of surplus supply may also reduce dangers of floods" (*ibid.*, p. 11).

The tasks were characterized as "a careful evaluation of the human or socio-economic factors in the area, their present state, their trends, and of the corresponding needs and requirements; a detailed study of development potentials offered by water and other natural resources; and preparation of a preliminary general programme of development" (*ibid.*, p. 10).

[379] "Without an appraisal of monthly or biweekly changes in the supply of, and demand for, water, not even a provisional estimate can be made of expected benefits" (*ibid.*, p. 11).

[380] *Ibid.*, annex I ("Organization of basic surveys"), pp. 47.

[381] *Ibid.*, especially pp. 12–15 and 49–50.

Social Council, in connection with international water resources, evaluated "the need for adequate information on international water resources and their development potential" in these terms:

8. The major incentive to co-operate in the development of international water resources depends largely upon an identification and appreciation of the benefits to be derived from such co-operation. It is thus imperative that the benefits in quantitative and qualitative terms be clearly known to the national decision-makers concerned. International co-operation should, to the fullest extent possible, be based upon reliable knowledge and a thorough understanding of alternative courses of action.

9. Unfortunately, for a large portion of the world's international water resources, information is still insufficient or non-existent. Nevertheless, in many of these cases co-operative efforts by the Governments in developing these resources could provide valuable benefits to the people in the area. To some extent, "international projects" have received second priority in national water development plans and often there are unrealistic expectations or misinformed apprehensions about international undertakings.[382]

3. State practice

218. Most international agreements for the purpose of development, use or protection of international watercourses contain provisions with respect to information or data sharing. In their Indus Waters Treaty of 1960, India and Pakistan agreed to exchange the following data on a monthly basis: gauge and discharge data relating to flow of the rivers at all observation points (daily observations, or as less frequently taken); daily extractions for or releases from reservoirs; daily withdrawals at the heads of all canals operated by government; daily escapages from all canals; daily deliveries from link canals. To the extent that other data are available, these are also to be supplied on request; hydrologic and meteorological observation stations may, by agreement, be set up at the request and expense of one party in the territory of the other. Data must also be communicated when any planned engineering work would materially affect the other party.[383]

219. At their second meeting, in 1968, the Foreign Ministers of the Plata Basin approved a series of studies, including studies of seven projects in which all five system States would participate. Two of these were on "Hydrometeorology and the subsequent establishment and operation of the regional network of hydrometeorological stations" and "Inventory and analysis of basic information on the natural resources of the basin and related issues".[384] At their fourth meeting, the Foreign Ministers made a distinction, however, between raw data and processed data:

3. As to the exchange of hydrological and meteorological data:

(*a*) Processed data shall be disseminated and exchanged systematically through publications;

(*b*) Unprocessed data, whether in the form of observations, instrument measurements or graphs, shall be exchanged or furnished at the discretion of the countries concerned.

4. The States shall try as far as possible gradually to exchange the cartographic and hydrographic results of their measurements in the River Plate Basin in order to facilitate the task of determining the characteristics of the flow system.[385]

220. Greece and Yugoslavia reached agreement in 1957 on a procedure and plan for co-operation in making hydro-economic studies of the drainage area of Lake Dojran. Topographical, hydrological, pedological, agronomic, fishing, alluvial accumulation, present uses and flood damage studies were worked out. For example, concerning hydrological studies, the parties agreed on the installation of meteorological, evaporimetric, heliographic and limnigraphic stations and on ways of measuring the flow of the lake's tributaries. A study of the level of subterranean waters was also recognized as useful; each country was to organize and carry out such a study in its own territory. It was also decided that the competent services of the two countries would proceed as soon as possible to exchange findings already established concerning water levels, the depth and duration of rainfall in the lake basin, the temperature and rate of evaporation of the water and the discharge coefficient in the lake basin.[386]

221. In at least one case, a penalty is expressly not attached to non-compliance with the provisions on exchange of information. The Treaty of 1950 between the Soviet Union and Hungary concerning the régime of their common frontier places the parties under a duty to exchange information concerning the level of rivers and ice conditions, so as to avert danger from floods or from drifting ice. Delay in communicating or failure to communicate such information shall not, however, constitute grounds for a claim to compensation for damage.[387]

222. In an early agreement between France and Switzerland concerning the disposition of hydro-power on the Rhone, the usefulness of data exchange was recognized: "For the purpose of checking the apportionment, the two Governments will provide each other with all the statistical data concerning the generation and use of the energy."[388] In the 1944 Treaty between Mexico and the United States of America, the two countries charged their International Boundary and Water Commission as follows with respect to data on the Rio Grande:

The Commission shall keep a record of the waters belonging to each country and of those may be available at a given moment, taking

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[382] E/C.7/2/Add.6.

[383] Arts. VI and VII (1) (*a*) (United Nations *Treaty Series*, vol. 419, p. 144); see also Baxter, *loc. cit.*, pp. 470–471.

[384] Acta de Santa Cruz de la Sierra, part II, A, reproduced in Organization of American States, *Ríos y lagos internacionales . . . (op. cit.)*, p. 152. The meeting also approved the Statute of the Comité Intergubernamental Coordinador de los Paises de la Cuenca del Plata, which is therein charged with, among other things, "centralizing the exchange of information of relevance to the stated objectives and such other information as the specialized national agencies consider pertinent" (art. 1 of the Statute) (*ibid.*, p. 157). See also art. 3 (*b*) (*ibid.*, p. 158).

[385] Declaration of Asunción on the use of international rivers (resolution No. 25), reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 324, document A/CN.4/274, para. 326.

[386] United Nations, *Legislative Texts . . .*, pp. 813–818.

[387] Art. 19 (*ibid.*, p. 825). A "regular system of signals to be used during periods of high water or drifting ice" is called for. On the other hand, art. 14, para. 2, of the Treaty provides:

"Where one contracting party occasions material damage to the other contracting party by failing to comply with the provisions of paragraph 1 of this article ['ensure that the frontier waters are kept in proper order'; 'take steps to prevent deliberate damage to the banks of frontier rivers'], compensation for such damage shall be paid by the party responsible therefor" (*ibid.*, p. 823).

[388] Art. 5, final para, of the 1913 Convention between France and Switzerland for the development of the water-power of the Rhone between the power station planned at La Plaine and a point to be specified (*ibid.*, p. 709). See also *Yearbook . . . 1974*, vol. II (Part Two), p. 161, document A/5409, para. 844.

into account the measurement of the allotments, the regulation of the waters in storage, the consumptive uses, the withdrawals, the diversions, and the losses. For this purpose the Commission shall construct, operate and maintain on the main channel of the Rio Grande (Rio Bravo) and each section shall construct, operate and maintain on the measured tributaries in its own country, all the gauging stations and mechanical apparatus necessary for the purpose of making computations and of obtaining the necessary data for such record. The information with respect to the diversions and consumptive uses on the unmeasured tributaries shall be furnished to the Commission by the appropriate section. The cost of construction of any new gauging stations located on the main channel of the Rio Grande (Rio Bravo) shall be borne equally by the two Governments. The operation and maintenance of all gauging stations or the cost of such operation and maintenance shall be apportioned between the two sections in accordance with determinations to be made by the Commission.[389]

223. Protocol No. 1 annexed to the Turkey–Iraq Treaty of friendship and neighbourly relations of 1946 recognizes the importance of data from the upper riparian, Turkey, and expresses the parties' agreement on the necessity "for installing permanent observation stations in Turkish territory to record the water-flow of the [Tigris and Euphrates] rivers and to communicate regularly to Iraq the result of these observations".[390] In the 1978 Treaty for Amazonian Co-operation, two articles are instructive on this subtopic concerning information and data:

Article VII

Taking into account the need for the exploitation of the flora and fauna of the Amazon region to be rationally planned so as to maintain the ecological balance within the region and preserve the species, the contracting parties decide to:

(*a*) Promote scientific research and exchange information and technical personnel among the competent agencies within the respective countries so as to increase their knowledge of the flora and fauna of their Amazon territories and prevent and control diseases in said territories.

(*b*) Establish a regular system for the proper exchange of information on the conservationist measures adopted or to be adopted by each State in its Amazonian territories; these shall be the subject of an annual report to be presented by each country.

. . .

Article XV

The contracting parties shall seek to maintain a permanent exchange of information and co-operation among themselves and with the agencies for Latin American co-operation in the areas pertaining to matters covered by this Treaty.[391]

224. In a related field, another recent treaty merits attention. In 1977, Denmark and the Federal Republic of Germany entered into an Agreement regulating the exchange of information on the construction of nuclear installations along the border.[392] Article 1 requires that a contracting party inform a neighbouring State of nuclear installations and that "suitable documents" be made available. Included are decisions regarding site, construction and operation authorizations, as well as fundamental changes in such authorizations. Other pertinent provisions include:

Article 3

Information as specified in article 1 together with relevant documents should be made available in sufficient time so as to permit the authorities of the constructing State to consider any comments and observations of the contracting party of the neighbouring State before a final decision is reached. The contracting party of the neighbouring State is obligated to examine without delay any documents obtained.

Article 4

Upon request, the contracting party of the neighbouring State undertakes to provide the contracting party of the constructing State information necessary to the evaluation of an installation, such as that relating to population distribution, or similar information relating to conditions within the neighbouring State which could operate to the detriment of the plant's security.

Article 5

The exchange of information, under the provisions of article 4, and of documents, under the provisions of article 3, shall be free of charge. Only if especially costly documents are requested must the contracting party which requests such information bear the costs which arise.[393]

225. The Republics of Sierra Leone and Liberia, assisted by UNDP, have undertaken along their common border the Mano River Basin Development Project, monitored by the countries' Mano River Union. The project, looking towards the construction of a major dam, involves a topographic survey, geological investigations, geophysical studies, socio-economic investigations, a power market survey, studies on transportion, agriculture, tourism and irrigation, as well as the collection and compilation of hydrometeorological data.[394] This kind of undertaking illustrates well the many kinds of data that may be relevant to a particular undertaking, as well as the fundamental role played by information and data in development projects involving shared water resources.

226. In those international watercourse systems for which the system States have opted for comprehensive planning and development with an international commission or organization as their agent, the handling of information and data tends to be centralized, including joint collection and processing, rather than simply "exchanged" between or among system States. Examples of such integrated action would include the system agreements for the Senegal, the Niger, the Kagera, the Gambia and Lake Chad in Africa and the lower Mekong in Asia, even though financial and human resources constraints may have limited the attainment of objectives in most of those systems.[395] Indicative of

[389] Art. 9 (*j*) (United Nations, *Treaty Series*, vol. 3, p. 334).

[390] Preamble (*ibid.*, vol. 37, p. 287). See also arts. 1, 2 and 3, providing for technicians from Iraq to conduct the field surveys, with collaboration from the Turkish technicians, and the assumption by Turkey of the responsibility to install, operate and maintain the observation stations, with equal sharing by the two parties of the expense of operation, etc. (*ibid.*, pp. 287–289).

[391] Text circulated to the General Assembly as document A/35/580, to be issued as No. 19194 in the United Nations *Treaty Series*. The signatories are Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela. See also art. IX, dealing with scientific and technological research on a joint or co-ordinated basis, including "seminars and conferences, exchange of information and documentation, and organization of means for their dissemination".

[392] *International Legal Materials*, vol. XVII, No. 2, 1978, p. 274.

[393] *Ibid.*, p. 275.

[394] See "The Mano River Basin development project", paper prepared by S. A. Ricks for the 1981 Dakar Interregional Meeting, reproduced in United Nations, *Experiences in the Development and Management* . . ., especially pp. 168–171.

[395] See e.g. the 1977 Agreement between Burundi, Rwanda and the United Republic of Tanzania concerning the establishment of the Organization for the Management and Development of the Kagera River Basin, especially arts. 2, 7, 10 and 11; "Powers of the Organization for the Development of the Senegal River in development of the river basin", paper prepared by Q. L. Nguyen for the 1981 Dakar Interregional Meeting, reproduced in United Nations,

this centralized approach, even where neither comprehensive planning nor integrated development has been embraced, are the data and information arrangements found in the Great Lakes water quality Agreement of 1978. There the parties' International Joint Commission is given a series of specific responsibilities with respect to the implementation of the Agreement, the first two of which are:

(*a*) Collation, analysis and dissemination of data and information supplied by the parties and State and Provincial Governments relating to the quality of the boundary waters of the Great Lakes System and to pollution that enters the boundary waters from tributary waters and other sources;

(*b*) Collection, analysis and dissemination of data and information concerning the general and specific objectives and the operation and effectiveness of the programme and other measures established pursuant to this Agreement;[396]

227. In this connection, the former Chairman of the International Joint Commission (Canada–United States of America), Canadian Section, has reflected upon the matter of "fact-gathering and fact-sharing", and has concluded as follows:

A dominant purpose of all co-operative exercises involving binational or multinational commissions or technical committees is that of obtaining information in aid of co-operative endeavours by the co-riparians. What distinguishes many of the agencies involved, however, is the extent to which facts are gathered jointly or only by national officials and, equally, the degree to which nationals alone or multinational agencies and personnel are involved in the fact-evaluation process. In short, while almost all the models seem to be concerned with some fact-finding and fact-sharing there is a fundamental distinction between facts found by teams jointly and made up from all the riparians and facts gathered only by national public servants and not by co-operative multinational teams with the results placed in a common pool of information. Unless this distinction is understood it will not often be easy to appreciate the difficulties that some river basin states face in dealing with data which may or may not be verifiable and therefore not effectively usable by the commission or technical committee concerned.[397]

228. Examples of data and information sharing on the basis of treaty arrangements could be multiplied many times. Included here have been what appeared to be representative samples of the wide variety of arrangements and requirements that system States have found suitable for their particular situations at the time that the treaties were concluded. Such arrangements may become dated, however, with the passage of time, so that they no longer provide the parties with the information and data, in whole or in part, relevant to contemporary uses and conditions of the international watercourse. Pending the reaching of replacement or supplementary agreements, system States expect to be able, under international law, to count on the co-operation of their co-system States for needed information and data where that is justified by existing or projected hydraulic works or other development, use or protection considerations. It is to support that felt need that the Commission's articles require provisions to make the rules in this area more definite and certain and to bring them into consonance with the burgeoning demands, world-wide, upon the resource. The United Nations General Assembly has put the matter succinctly in article 3 of the Charter of Economic Rights and Duties of States:[398]

In the exploitation of natural resources shared by two or more countries, each State must co-operate on the basis of a system of information and prior consultations in order to achieve optimum use of such resources without causing damage to the legitimate interests of others.

229. This indispensability of information and data collection and exchange is undisputed with regard to co-operation and collaboration with a view to rational utilization of the water resources of an international watercourse system. It is equally fundamental if it is the desire of the parties to accommodate differences that have arisen or may arise, or to settle their formal disputes on a sound basis with a view to optimum development, use and protection of their shared water resources.

4. The proposed article

230. A general provision among the Commission's articles, properly limited and taking into account the differing capabilities of system States, is thus justified. The terms proposed for the consideration of a successor Special Rapporteur and of the Commission are:

Article 9. Collection, processing and dissemination of information and data

1. System States are under a general duty to provide one another at regular intervals with the available basic hydrological, meteorological and hydrogeological information and data pertinent to the planning for, and rational utilization of, the water resources of their international watercourse system or systems, including information and data previously collected, unless no system State is presently using or planning to use the water resources of the system. If a system State requests from another system State information or data that are not available, the system State from which the information or data are requested will use its best efforts to provide the information or data but may require the requesting system State to pay the reasonable costs of collecting and, where appropriate, processing such information or data.

2. In any international watercourse system where system States have decided to develop, use, protect or study the watercourse system as a whole, it is the duty of each system State, unless otherwise agreed, to furnish

Experiences in the Development and Management . . ., p. 142; "Co-operation in the Lower Mekong River Basin", paper prepared by the Mekong Secretariat for the 1981 Dakar Interregional Meeting (*ibid.*, especially pp. 245–247); Statute of the Committee for Co-ordination of Investigations of the Lower Mekong Basin established by the Governments of Cambodia, Laos, Thailand and the Republic of Viet Nam, 1957, especially arts. 4 and 6 (United Nations, *Legislative Texts* . . ., pp. 268–269); "Background, history and activities of the Lake Chad Basin Commission", paper prepared by the Lake Chad Basin Commission for the 1981 Dakar Interregional Meeting, reproduced in United Nations, *Experiences in the Development and Management* . . ., p. 184; "Technical note on the Gambia River Development Organization", prepared by that body for the 1981 Dakar Interregional Meeting (*ibid.*, p. 420).

[396] Art. VII, para. 1, of the 1978 Agreement between the United States of America and Canada on Great Lakes water quality (*United States Treaties and other International Agreements, 1978–1979* (Wasington, D.C., 1980), vol. 30, part 2, p. 1393). Under art. VI of the 1977 Agreement between India and Bangladesh on sharing of the Ganges waters at Farakka and on augmenting its flows (*International Legal Materials*, vol. XVII, No. 1, 1978, p. 104), the Indo-Bangladesh Joint Committee, created to administer the sharing arrangements for the Ganges waters, is also expected to generate data of its own, which it must then submit to the Governments.

[397] Cohen, *loc. cit.*, p. 112.

[398] General Assembly resolution 3281 (XXIX) of 12 December 1974.

the other system States the information and data pertinent to the system State agreement.

3. In those cases where a data collection and processing scheme is implemented by system States individually, each such system State is under a duty to execute the scheme faithfully and to ensure the reliability of collection and the timeliness of processing, if required, and reporting of the data to the other system States concerned or to their joint or international data centre, as appropriate.

4. In an international watercourse system where an actual or potential question of conflict between existing or planned uses, of water quality or of hazard control has been raised by a system State, all system States concerned shall undertake or make arrangements to accomplish, jointly with other system States or individually and taking into account the resources available to the individual system States, the systematic collection, processing and dissemination to the Governments concerned, on a regular and timely basis, of the information and data pertinent to the question raised.

5. Each system State shall employ its best efforts to collect and, where required, to process information and data in a manner which facilitates co-operative utilization of the information and data by the other system States to which it is to be disseminated.

6. Information or data vital to a system State's national defence need not be provided to other system States, provided that the system State declining to provide such information or data co-operates in good faith with the other system State in order to inform it as fully as practicable under the circumstances. Information and data determined in good faith by a system State to be of a restricted nature only shall be provided to other system States upon request, provided that the requesting system State demonstrates its willingness and ability to safeguard the information or data in a manner consistent with its restricted nature.

7. Each system State is under a special obligation to inform, by the most rapid means available, any other system State concerned in the event of any condition or incident, or immediate threat of any condition or incident affecting shared water resources that could result in a loss of human life, a failure of a hydraulic work or other calamity in the other system State or States.

231. Article 9 as here propounded endeavours to cover the salient concerns of system States without going beyond what is to be expected from a "residual" set of rules on information and data. Clearly, system States should conclude among themselves system agreements to take care of their special requirements; in the proposed article only available information and data need be exchanged as a matter of general legal duty, unless a requesting system State is willing to pay for the cost of their acquisition and handling (para. 1). If such be the case, the requesting system State must certainly value the information or data and no reasonable request should then be denied. If "payment" alone is inadequate to obtain the desired result, there is precedent for the system States to agree to allow the requesting system State or a third party to undertake the task, providing the necessary expertise and equipment; the result would ordinarily also be useful to the system State from whose territory the information or data must be collected. Where the international watercourse system is not being used, and there are no plans for its use, the duty to furnish information and data is excused. As a whole, article 9 is limited to situations actually requiring information or data.

232. Obviously international watercourse systems that are intensively used or are intended for multipurpose development by the system States require a much more ambitious data and information programme than is called for in this article; more elaborate information and data schemes are given their specificity in system agreements. The current state of development and use of most international watercourses has long ago made the necessity for a data base abundantly clear. Nonetheless, a number of international watercourses are not yet being used or have not been developed sufficiently to justify the burdens of even technical information exchange. Should the system States of a little utilized international watercourse nonetheless deem it advisable to collect and exchange information or data—possibly with a view to future plans, disease or flood control or drought mitigation, for example—international law interposes no barrier. On the other hand, the law does not require a futile thing and, if information and data cannot or will not be turned to relevant use, there is no legal obligation to exchange or report.

233. Paragraph 2 addresses itself to a situation where some of or all the system States have agreed to treat the international watercourse system in its entirety, and not piecemeal. Their agreement may contain adequate provision for information and data collection, processing and dissemination, but where it does not, an underlying duty is imported to support the realization of the system State agreement. As in paragraph 1, the information or data required to be furnished need not, in the absence of agreement to the contrary, be processed. With this general international rule as the point of departure, system States should be motivated to spell out an agreed content for this necessarily indefinite provision.

234. Paragraph 3, focused on data, concerns itself with the "quality" of the effort by system States, where a jointly or internationally operated information and data programme has not been adopted, but a decentralized one has been chosen. Consequently, system States will have to depend upon the accuracy and promptness of the product produced by each of the other system States. Agreement upon some specific collection programme is presumed. To serve the purpose for which it was designed, a system State must be able to rely upon the work done by other system States. The agreed arrangement may be for exchange only, or it may provide for or designate an agency of one of the system States as a central clearing house or documentation centre. For a number of international watercourse systems, this is a prime function of the joint or international staff. In the event that there is such a central receiving point, the article allows for that alternative.

235. Paragraph 4 is concerned with the interest of one system State in acquiring important information or data when it ascertains that a water-related issue has arisen or may arise, the evaluation of which, and the appropriate measures in response to which, must rest upon analysis of the relevant information and data. This aspect of the information and data requirements is triggered by the action of any system State. Assuming

good faith, the question or problem being experienced or foreseen will be a genuine one; "fishing expeditions", feared by some States (that is, where the request is without justification in terms of shared water resources development, use or protection), are best averted by a showing of the facts dissipating the claimed apprehension of the requesting system State. The paragraph anticipates that one or more system States may have limited capabilities and not be able themselves to perform the obligation. In such cases, a system State may seek the assistance of another Government or of an international organization, thus making "arrangements to accomplish" the tasks associated with its duty under this provision. The information and data are required to be systematically collected, processed and transmitted, reflecting again the essential need for information and data that can readily be put to use. Although this clause falls far short of obliging the adoption of formal systems analysis, or even of an agreed "design" as advocated by modern water resources managers, it does mean thoroughness and coherence, according to accepted and practicable methods, probably including minimum standards of periodicity of recording.

236. Information and data are often fragile, that is, lose value with the passage of time, except for supplementing the longer-range historical data base; therefore the rule requires regular and timely communication of the information and data to the user. This point is universally regarded as indispensable to the process. Governments have been known to complain that information and data exchange may be readily agreed to but that, from administrative inefficiency or otherwise, another Government's reports are not received, are long delayed or are incomplete when received. The requirement of "regular and timely" here is intended to make clear that, once such an information and data programme is called for, the system States are under an ancillary duty to ensure seasonable preparation and dispatch of their contributions.

237. It will be noted that the kinds of information and data to be collected and processed are not at all specified. Hydrologic or hydrographic data, including flow regimes, power potentials, etc., are most frequently indicated in this context. The kinds, intensities and economic values of the uses to which the system water is put are also, of course, likely to be pertinent; increasingly the emphasis may be placed on contaminants. Where a "new" region is receiving intensive joint planning, socio-economic data and a variety of other kinds of information—even critical—may be called for in calculating the potential for hydro-electric power consumption, irrigation, or floods, for example. Nonetheless, the requirement is restricted to such information and data as are relevant to the issue raised by the requesting system State. It may be said that this rule is "the other side of the coin" of the rule requiring a system State to inform in connection with appreciable harm: the right of a system State to demand information and data under the stated circumstances.

238. In *all* aspects of information and data sharing, the matter of usability is fundamental. Thus the rule in paragraph 5 makes general the requirement that the methods employed by a system State in furnishing any information or data to its co-system States be such as not to make difficult their incorporation into the larger information and data picture when received. Each system State benefits from the observance of such a basic requirement. It is not disputed that compliance with the specifications of the scheme adopted is a *sine qua non* in the creation and maintenance of a reliable and adequate data base.

239. Paragraph 6 addresses itself to a persistent concern of sovereign States: the non-disclosure of "classified" information. The very real needs in the information and data field when dealing with shared water resources must here be balanced against this undeniable interest of the system State to retain confidentiality in sensitive circumstances. This sensitive area is not limited to strategic or military types of information, however. The matter of "trade secrets", national or corporate, has also come up in this context, as has a reluctance to divulge certain aspects of economic planning or local socio-economic conditions. The specialists in water resources have to date given little attention to this problem, although it certainly has been recognized; a number of treaties have exempted "defence" or "proprietary" information. The most useful comments on the issue are those of OECD. That organization's work on the point in relation to transfrontier pollution is summarized in a recent report, which reads in part as follows:

> C. *Difficulties met with in transmitting certain types of information*
>
> 40. The *transmission of information*, even among countries which have long entertained bonds of friendship and neighbourliness, *is however subject to certain restrictions*. In order to protect its economic, industrial, commercial or strategic interests, it would seem normal for a country to have provided under its national legislation (statutes and regulations, decrees, etc.) that certain data relating to such matters, notably national defence, should not in principle be divulged to foreign countries. Such a limitation as a rule is explicitly recognized in the texts of agreements or recommendations concerning information and consultation . . .
>
> 41. On this score, it is interesting to refer to the most recent practice regarding information and consultation procedures between certain member countries concerning activities in their frontier regions. Documents which are classified as confidential according to national law may however be excluded from the exchange of information. In such cases, "the country of origin should nevertheless co-operate with the exposed country with the aim of informing it as completely as possible, or of finding another satisfactory solution".
>
> 42. In this regard it would seem that in general everything depends on how the countries interpret the concept of "confidential documents". *The key principle in the matter of information and consultation is good faith*. On this account it need not be stressed that a country would depart from this principle, one underlying all neighbourly relations, were it to fall back on a too extensive "State-secret" concept, thus making entirely void information and consultation of its substance.
>
> Anyway, certain manufacturing processes or military security arrangements, for example, will doubtless always be regarded as covered by secrecy. From a more general standpoint the information which a country might be induced to provide or especially ask for must be *directly related* to assessment of the transfrontier pollution risk involved by the proposed activity or measure and to methods for dealing with any such pollution if it arises.[399]

The provision proposed in the draft article does not automatically excuse the system State asked to furnish information or data by a mere showing of a municipal law or regulation barring disclosure. The duty is divided into two categories. If the matter be vital from

[399] OECD, *Transfrontier Pollution and the Role of States* (*op. cit.*), p. 23.

the standpoint of national defence, the system State is excused on condition that it furnish as much of the requested information or data, perhaps in condensed or paraphrased form, or in approximations, as will be sufficient to apprise the other system State of the basic situation and allow it to take such informed action as may be appropriate. If, on the other hand, the information or data be of a lesser, "restricted" character, whether economic, military or social, the duty to furnish is not excused where the other system State can show that it is prepared to protect the restricted status and that its laws, regulations and practices give assurances that the information or data will in fact be so protected. It is, after all, not uncommon for "classified" information to be shared with friendly foreign Powers, although verifications from time to time of the receiving Government's safeguarding may be exacted.

240. In the last analysis, some provision covering "sensitive" information and data is unavoidable; the use of two "classifications" is well understood by Governments; legitimate refusals to disclose must be honoured. Yet it would not be tolerable to other system States to accept as a general rule that the unilateral characterization as "secret", be it based on domestic law or otherwise, suffices to relieve a system State of any or all of its duty to share information and data regarding the development, use or protection of something itself so vital as an international watercourse system. An initial, perhaps inevitably not wholly satisfactory, attempt to deal with the problem is submitted in paragraph 6 of this draft article.

241. The final paragraph, paragraph 7, of the article addresses a well recognized need to warn and to warn quickly. The substance of rules with respect to floods, toxic pollution spills and other hazardous events, be they caused by man or nature, belongs in other, separate articles. However, the duty of immediate communication of information about the hazard, it is suggested, can properly be placed in this article. Many international watercourse systems are already provided with early warning machinery by express agreement. These, of course, would not be replaced by this rule. For systems without such arrangements, system States may rely upon this provision but are likely to be stimulated to seek accords for warnings, including designation of specific communications facilities. Paragraph 7 evidences the residual rule.

242. In summary, the proposed article does not pretend to regulate all the variables in the field of information and data sharing. System States are expected to reach agreement in due course, tailoring their information and data sharing to their requirements as conditioned by the realities of a specific international watercourse system. Collection, processing and dissemination of information and data are perhaps the very best example of the need to respect the uniqueness not only of the physical water resources system but of socio-political and economic factors as well.

F. Environmental pollution and protection

243. Under section D, on responsibility for appreciable harm, treated *in extenso* above, problems of pollution have been addressed. Similarly, environmental damage that results in appreciable harm to co-system States is taken up in that section. The general article there proposed does not, however, comprehensively deal with developing practice and doctrine regarding either pollution or the environment.

244. For some, pollution has now become a subsumed portion of the newer field of environmental law, including international environmental law.[400] To be sure, much of the scope of the already numerous international environmental agreements is directly or indirectly concerned with pollution; many of the illustrations employed in environmental studies are drawn from pollution or contamination problems.[401] And yet the field of environmental improvement, as well as protection, is not exhausted with treatment of the standard situations of pollution. It is indeed difficult to constrict the scope of "the environment" to something less than all relationships between man and the earth's ecosystems. With man included or man excluded, the environment embraces, technically, all natural phenomena.[402] In practice, however, it is clear and understandable that States have, neither in their domestic policies and legislation nor in their international relations, acquiesced in this all-embracing approach of some students of the environment.

245. Yet the record seems to admit legitimate concern, including international concern, for practices that impinge unfavourably on some aspects of nature, but which ultimately are not limited to effects that have a directly or even indirectly adverse impact upon man and his activities. Moreover, beginning clearly at the Stockholm Conference[403] and emphasized at the Vancouver "Habitat" Conference,[404] national and international agencies have been directed to regard improvement of the "quality of life" for human beings as being among the objectives of environmental programmes.[405] Thus this section submits for the consideration of a successor Special Rapporteur and of the Commission an approach to the realities of present-day environmental concerns, identifying the obligations of States to protect and also, in general terms and under certain

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[400] See e.g. V. G. Arnaud, *Derecho internacional ambiental: la contaminación de los ríos en el derecho internacional público* (Buenos Aires, Instituto Nacional de Ciencia y Técnica Hídricas, 1974), pub. No. 11; American Society of International Law, *Proceedings of the 71st Annual Meeting* (San Francisco, Calif., 21–23 April 1977), session on "International environmental protection: policy, legal and trade aspects", especially S. McCaffrey, "Pollution of shared natural resources: legal and trade implications" (p. 56).

[401] See e.g. E. Brown, "The conventional law of the environment", *International Environmental Law*, L. A. Teclaff and A. E. Utton, eds. (New York, Praeger, 1974), p. 25; L. A. Teclaff, "The impact of environmental concern on the development of international law", *Natural Resources Journal*, vol. 13, 1973, p. 357; H. J. and R. F. Taubenfeld, "Modification of the human environment", *The Future of the International Legal Order*, vol. IV: *The Structure of the International Environment*, C. E. Black and R. A. Falk, eds. (Princeton, N.J., Princeton University Press, 1972), p. 124.

[402] See e.g. L. K. Caldwell, "Concepts in development of international environmental policies", *International Environmental Law (op. cit.)*, p. 12; M. Hardy, "The United Nations Environment Programme" (*ibid.*, p. 57).

[403] See *Report of the United Nations Conference on the Human Environment . . .*

[404] See *Report of Habitat: United Nations Conference on Human Settlements, Vancouver, 31 May–11 June 1976* (United Nations publication, Sales No. E.76.IV.7).

[405] See e.g. the first of six "priority subject areas of the [United Nations Environment] Programme", namely, "Human settlements, human health, habitat and well-being", listed in UNEP Governing Council decision 8 (II) of 22 March 1974 (*Official Records of the General Assembly, Twenty-ninth Session, Supplement No. 25* (A/9625), pp. 59–61). The second priority subject area was "Land, water and desertification" (*ibid.*, p. 61).

conditions, to improve the environment, as these involve international watercourse systems. These duties, it is widely recognized, are not, in the context of this topic, limited to "appreciable harm" to the environment of other States or of other system States.

246. The law in this field is largely new and less than may be desired by many concerned with the fragility of many of the ecosystems of "planet earth" and the urgency of measures of protection in numerous critical areas. The record at the level of conventional international law is already remarkable; the inferences that can at this juncture justifiably be drawn from that body of contractual norms are few but important. As with other of the Commission's articles on this topic, system States will be well advised to reach agreement on the particulars of their joint action and responsibilities. However, it is believed that there has emerged, over and above the rights and obligations which two or more States may confirm and assume vis-à-vis one another, a normative principle making protection of the environment a universal duty even in the absence of agreement, a principle born of sharpened awareness of the vast ramifications consequent upon man's tampering with the intricate relationships among the elements and agents of nature.[406]

247. Conversely, however, it is not possible to subsume all environmental problems under the rubric of pollution. Leaving a precise legal definition for subsequent consideration, it may be said that, for watercourse systems, pollution involves the use of water *by man* (or his animals, crops or industries) and the impact upon water of other activities for which man is responsible, with consequent detrimental effect. Commonly perceived, environmental damage is harm to *nature* in the broader sense, more especially, perhaps, to biological complexes of myriad sorts. The impact of such damage upon man, while probable, even if in the very long run, may be highly indirect or not even ascertainable. Thus environmental damage currently measurable solely within the territory of a system State arguably may fall under international regulation because the legal presumption is that preservation of the environment in the large is a licit concern of all nations.[407]

248. As a result, and after fashioning on a trial basis separate articles for pollution and for environment, the article herein proposed comprehends but distinguishes between these related concerns. Naturally, under this topic of the law of the non-navigational uses of international watercourses, all aspects of international environmental law are not treated. In like manner, principles and rules for transnational pollution not water-related are by definition excluded. Traditionally, international water resources law has addressed the problems of pollution, omitting concern for the environment as a whole.[408] Common cause could have been made with the traditional approach, leaving to what has come to be called international environmental law the water-related aspects of environmental regulation. International environmental law generally is in a less codified state, however, than even the law of international watercourses. Since environmental aspects are of real consequence to the rational development, use and protection of shared water resources, principles and rules pertaining to the environment have here been integrated with pollution into one proposed draft article.

1. Historical development of pollution control

249. A brief survey of the traditional view, confined to pollution, makes a good starting point for the development of this subtopic. The direct link with the doctrine of appreciable harm and of reparations in this record is manifest.

250. Treaty practice concerning pollution of international watercourses is by no means a recent development. The earliest anti-pollution clauses occurred most frequently in treaties to safeguard fishing in boundary waters.[409] Several other conventions covering boundary waters have given attention to water quality, also from relatively early times.[410] Over time the pollution problems have become more apparent and the prospects more alarming; consequently, anti-pollution articles have become more common, if not virtually standard.[411] The Indus Waters Treaty of 1960 between

[406] See Inter-American Bar Association, Committee XV (Natural Resources and Environmental Protection), resolution 30 (*Resolutions, Recommendations and Declarations approved by the XXII Conference* (Quito, 14–20 March 1981), p. 7.

[407] See the observations and precedents considered in the final report by J. J. A. Salmon, "La pollution des fleuves et des lacs et le droit international" (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, pp. 330), and the text of the relevant draft resolution (*ibid.*, p. 358).

[408] See e.g. chap. 3 of the Helsinki Rules and the commentary thereto (ILA, *Report of the Fifty-second Conference* . . ., pp. 494–505).

[409] See e.g. the following fisheries agreements: between the Grand Duchy of Baden and Switzerland of 1869 (G. F. de Martens, ed., *Nouveau recueil général de traités* (Göttingen, Dieterich, 1875), vol. XX, p. 166, and of 1875 (*ibid.*, 2nd series, 1878, vol. II, p. 60); between France and Switzerland of 1880 (*ibid.*, 2nd series, 1884, vol. IX, p. 111), and of 1904, arts. 6, 11, 17 and 29 (United Nations, *Legislative Texts* . . ., pp. 703 and 705–707); between Italy and Switzerland of 1882 (G. F. de Martens, *op. cit.*, 2nd series, vol. IX, p. 564), and of 1906, art. 12, especially the fifth para. (United Nations, *Legislative Texts* . . ., pp. 841–842); between the Grand Duchy of Luxembourg and Prussia of 1892, art. 2, sect. 11 (G. F. de Martens, *op. cit.*, 2nd series, 1899, vol. XXIV, p. 153); between Switzerland, the Grand Duchy of Baden and Alsace-Lorraine of 1887, establishing uniform provisions regarding fishing in the Rhine and its tributaries, as well as in Lake Constance, art. 10 (United Nations, *Legislative Texts* . . ., p. 401). See also Manner, "Water pollution in international law: the rights and obligations of States concerning pollution of inland waters and enclosed seas" (United Nations, *Conference on Water Pollution Problems in Europe* (Geneva, 22 Feb.–3 March 1961), vol. II (Sales No. 61.II.E/mim.24), pp. 450–453).

[410] See e.g. the Convention of 1904 between France and Switzerland (United Nations, *Legislative Texts* . . ., p. 701); the Treaty of 1909 between the United Kingdom and the United States of America relating to boundary waters between the United States and Canada, art. IV (*ibid.*, p. 261); the Treaty of 1925 between Germany and France, art. 44 (League of Nations, *Treaty Series*, vol. LXXV, p. 275); the frontier settlement Agreement of 1948 between Finland and the Soviet Union (United Nations, *Treaty Series*, vol. 217, p. 159); the Final Act on delimitation of the frontier between France and Spain of 1868, part I, para. 6 (United Nations, *Legislative Texts* . . ., p. 676); the 1963 Agreement between France, Federal Republic of Germany, Luxembourg, Netherlands and Switzerland concerning the International Commission for the Protection of the Rhine Against Pollution (*Journal officiel de la République française* (Paris), 97th year, No. 135, 13 June 1965, pp. 4909–4910) (for a summary of the Agreement, see B. Rüster and B. Simma, eds., *International Protection of the Environment*, vol. X (Dobbs Ferry, N.Y., Oceana Publications, 1977), p. 4820).

[411] See e.g. the 1957 Treaty between El Salvador and Guatemala on the utilization of the waters of Lake Güija (El Salvador, *Diario*

(Continued on next page.)

Pakistan and India, for example, contains this language:

(10) Each Party declares its intention to prevent, as far as practicable, undue pollution of the waters of the rivers which might affect adversely uses similar in nature to those to which the waters were put on the effective date, and agrees to take all reasonable measures to ensure that, before any sewage or industrial waste is allowed to flow into the rivers, it will be treated, where necessary, in such manner as not materially to affect those uses: provided that the criterion of reasonableness shall be the customary practice in similar situations on the rivers.[412]

251. The corresponding provision in the 1956 Agreement between the Soviet Union and Czechoslovakia requires the parties to ensure that the waters are kept clean and not artificially polluted or fouled *in any way*.[413] The Agreement concluded by Hungary and Yugoslavia in 1957 concerning fishing in frontier waters provides:

It shall be prohibited . . . to discharge untreated waste waters and other substances harmful to aquatic wildlife, irrespective of the manner in which and the distance from which such substances reach the frontier waters. A contracting party failing to respect this provision shall make compensation for any damage caused.[414]

252. With respect to the Danube, in 1958 Bulgaria, Romania, the Soviety Union and Yugoslavia imposed on themselves the duty to

work out and apply measures to prevent the contamination and pollution of the river Danube and of the waters referred to in article 3 by unclarified sewage and other waste from industrial and municipal undertakings which are harmful to fish and other aquatic organisms . . .[415]

The 1952 Agreement between Poland and the German Democratic Republic concerning navigation in frontier waters provides that each contracting party undertakes:

4. To prevent, by appropriate means and installations, any waters entering the frontier sector of the rivers Oder and Nysa Luzycka . . . and any effluents from towns, settlements or industrial plant from introducing into the said rivers physical, chemical or bacteriological impurities of such nature and in such quantities as:

(*a*) To affect adversely the use of the water of the said rivers for domestic requirements, water supply, industry and agriculture;

(*b*) To cause bridges, dams, other water engineering works and installations, and vessels to become corroded and overgrown with slime and aquatic flora and fauna;

(*c*) To cause the excessive accumulation of slime on the beds and banks;

(*d*) To affect adversely the normal development of the typical aquatic flora and fauna of the said rivers.[416]

2. The modern practice of pollution control

253. By Convention in 1962, France and Switzerland agreed to co-operate closely in order to protect the waters of Lake Léman against pollution, including the surface water and ground water of tributaries, in so far as these contribute to the pollution of the lake and its effluent to the point at which it leaves Swiss territory.[417] The 1964 Agreement between Finland and the Soviet Union concerning frontier watercourses requires the parties to take measures to ensure that frontier watercourses are not polluted by untreated industrial effluents and sewage, by waste materials from timber floating or ships, or by other substances that immediately or over time might cause diminution of the depth of the watercourses, harmful changes in the composition of the water, damage to fish stock, substantial scenic deterioration, endangering of public health or have similar consequences for the population and the economy.[418] The 1971 frontier rivers Agreement between Sweden and Finland requires that the greatest possible attention be given to the preservation of fish stocks and the prevention of water pollution.[419]

254. Except for a few agreements concluded by the then colonial Powers,[420] the international watercourses of Africa apparently received scant international attention in respect of their quality until quite recently. Even the Nile Waters Agreement of 1959 concluded by the Sudan and the United Arab Republic carries no water quality provision.[421] By 1963, however, the question of contamination of shared water resources had ceased to be a mere technical matter in that continent. In that year, Cameroon, Chad, Dahomey, Ivory Coast, Guinea, Mali, Niger, Nigeria and Upper Volta joined to undertake close co-operation with respect to the study and the execution of any project likely to have an appreciable effect on, *inter alia*, the sanitary conditions of the waters of the River Niger, its tributaries and sub-tributaries, and the biological characteristics of

(*Footnote 411 continued*)

oficial, vol. 175, No. 108, 12 June 1957, p. 4994); the 1956 Convention between the Federal Republic of Germany, France and Luxembourg (duty to take necessary measures to keep the Moselle and its tributaries clean) (United Nations, *Legislative Texts* . . ., p. 424); the 1956 Treaty between France and the Federal Republic of Germany concerning the settlement of the Saar problem, annex 8, art. 8: ". . . ensure the purity and salubrity of the waters" of the Saar and its tributaries (*ibid.*, p. 659); the 1960 Settlement Treaty between the Netherlands and the Federal Republic of Germany (United Nations, *Treaty Series*, vol. 508, p. 148); the 1960 Convention between the Land Baden-Württemberg, the Free State of Bavaria, Austria and Switzerland on the protection of Lake Constance against pollution (United Nations, *Legislative Texts* . . ., p. 438).

[412] Art. 4, para. (10) (United Nations, *Treaty Series*, vol. 419, pp. 138–140).

[413] Art. 14, para. 1 (*ibid.*, vol. 266, p. 312). See the almost identical provision in the 1949 Norway–USSR frontier Agreement (*ibid.*, vol. 83, p. 352, art. 14, para. 1); the 1960 Finland–USSR frontier Agreement (*ibid.*, vol. 379, p. 342, art. 15); the 1948 Poland–USSR frontier Agreement (*ibid.*, vol. 37, p. 82, art. 17).

[414] Art. 5 (United Nations, *Legislative Texts* . . ., p. 837).

[415] Art. 7, Convention concerning fishing in the waters of the Danube (United Nations, *Treaty Series*, vol. 339, p. 62). Art. 3 provides:

"This Convention shall apply to the waters of the Danube, including its mouth, to tributaries of the Danube up to the maximum extent of its flood waters, and to lakes, estuaries and pools permanently or temporarily connected with the Danube, in the Danube flood-basin in the territory of the contracting parties, including the area adjoining the mouth" (*ibid.*, p. 60).

[416] Art. 17, para. (4) (*ibid.*, vol. 304, pp. 168–170). See also art. 2, para. 7, of the 1956 Treaty between Hungary and Austria concerning the regulation of water economy questions in the frontier region (*ibid.*, vol. 438, p. 150). There are numerous other similar examples of agreements concluded in Western, Central and Eastern Europe beginning some 30 years ago.

[417] See *Yearbook* . . . *1974*, vol. II (Part Two), p. 308, document A/CN.4/274, paras. 202–205. See also the 1963 Treaty between Belgium and the Netherlands concerning the connection between the Scheldt and the Rhine, arts. 16 and 17, dealing with salinization and radioactive waste and other kinds of pollution (United Nations, *Treaty Series*, vol. 540, pp. 62–64).

[418] Art. 4 (*ibid.*, vol. 537, p. 254). See also arts. 10 and 11 of the 1964 Agreement between Poland and the Soviet Union concerning the use of water resources in frontier waters (*ibid.*, vol. 552, p. 194).

[419] Chap. 1, art. 3 (*ibid.*, vol. 825, p. 274).

[420] See the 1934 Agreement between Belgium and the United Kingdom regarding water rights on the boundary between Tanganyika and the Ruanda-Urundi, art. 3 (League of Nations, *Treaty Series*, vol. CXC, p. 104).

[421] United Nations, *Treaty Series*, vol. 453, p. 64.

their fauna and flora.[422] And in 1964, Guinea, Mali, Mauritania, and Senegal agreed, with respect to the Senegal River, as follows:

> The riparian States undertake to submit to the Inter-State Committee, as from their initial stage, projects whose execution is likely appreciably to alter . . . the sanitary conditions of [the river's] waters, and biological characteristics of its fauna and flora.[423]

255. In Asia, aside from the landmark Treaty between India and Pakistan regarding the use of the waters of the Indus already cited, apparently few agreements devoted to international watercourses have as yet made provision for water quality.[424] Occasionally a boundary treaty has employed language within which attention to pollution control measures arguably may be implied, particularly where a joint commission has been set up.[425]

256. Notable agreements in the Western Hemisphere, beyond the cited basic Treaty of 1909 between Canada and the United States of America, include the 1961 Treaty between Argentina and Uruguay concerning the countries' boundary in the Uruguay River. There the parties stated that they "shall agree on a statute governing the utilization of the river, which shall cover", among other things, "provisions designed to avoid pollution of the waters".[426] In 1975, the two system States concluded the promised Statute and created the Uruguay River Administrative Commission.[427] The provisions most pertinent for this section of the report, including environmental protection, are as follows:

Article 35

> The parties undertake to adopt the necessary measures to ensure that the management of land and forests and the use of the groundwaters and of the tributaries of the river do not effect an alteration such as to cause appreciable harm to the regime of the river or the quality of its waters.

Article 36

> The parties shall, through the Commission, co-ordinate appropriate measures to prevent the alteration of the ecological balance, and to control impurities and other harmful elements in the river and its catchment area.

Article 37

> The parties shall agree on measures to regulate fishing activities in the river with a view to the conservation and preservation of living resources.

Article 41

> Without prejudice to the functions assigned to the Commission in the matter, the parties undertake:
>
> (*a*) To protect and preserve the aquatic environment and, in particular, to prevent its pollution by enacting appropriate regulations and adopting appropriate measures, in accordance with the applicable international conventions and, where relevant, in conformity with the guidelines and recommendations of the international technical organizations;
>
> (*b*) Not to attenuate, in their respective legislations:
>
> (1) The technical requirements in force to prevent the pollution of the waters, and
>
> (2) The severity of the penalties established for infringements;
>
> (*c*) To inform one another of any regulation that they intend to impose in connection with the pollution of the waters, with a view to establishing equivalent regulations in their respective legislations.

Article 42

> Each party shall be liable to the other for damage resulting from pollution caused by its own activities or by those of natural or juridical persons in its territory.[428]

257. Mexico and the United States of America, in their 1944 Treaty relating to the utilization of the waters of the Colorado and Tijuana Rivers, and of the Rio Grande (Rio Bravo), did not, in the ordinary sense, include a quality term.[429] The salinity of the water delivered to Mexico in the Colorado River gave rise to problems for Mexico and occasioned protracted negotiations with the United States. The two countries in 1973 came to an agreed solution, through their International Boundary and Water Commission. The maximum permissible salinity of the water delivered to Mexico is specified.[430]

258. Although additional treaty provisions could be marshalled to show the awareness of most system States of the significance of international co-operation in the field of pollution, such as the elaborate Great Lakes Water Quality Agreement of 1978 between

[422] See art. 4 of the 1963 Act regarding navigation and economic co-operation between the States of the Niger Basin (*ibid.*, vol. 587, p. 13).

[423] Art. 3 of the 1964 Convention relating to the status of the Senegal River, reproduced in *Revue juridique et politique* (Paris), vol. XIX, No. 2, p. 303; see also the similar provision in art. 5 of the 1964 statutes relating to the development of the Chad Basin adopted by Cameroon, Chad, Niger and Nigeria (*Journal officiel de la République fédérale du Cameroun* . . ., 4th year, No. 18, 15 Sept. 1964, p. 1003). See also *Yearbook . . . 1974*, vol. II (Part Two), pp. 289–291, paras. 45–56.

[424] See, however, the 1958 Treaty between the Soviet Union and Afghanistan, art. 13: "The competent authorities of both contracting parties shall take the necessary measures to protect the frontier waters from pollution by acids and waste products and from fouling by any other means" (United Nations, *Treaty Series*, vol. 321, p. 180).

[425] See clause II of the Final Demarcation Protocol of the Commission on the Demarcation of the Turco-Syrian Frontier of 1930, stipulating:

> "As regards questions arising from the joint use of the river [Tigris]:
>
> ". . . The settlement of all such questions as navigation, fishing, industrial or agricultural utilization of the waters and policing of the river shall be based on the principle of complete equality" (United Nations, *Legislative Texts* . . ., p. 290).

See also *Yearbook . . . 1974*, vol. II (Part Two), p. 107, document A/5409, para. 416.

[426] Art. 7, especially subpara. (*f*) (United Nations, *Legislative Texts* . . ., p. 164).

[427] *Actos internacionales Uruguay–Argentina 1830–1980 (op. cit.)*, pp. 604–606, chap. XIII, arts. 49–57.

[428] *Ibid.*, pp. 600–602. The Treaty on the La Plata River and its maritime limits, entered into by the same parties in 1973, has similar provisions in chap. IX ("Pollution"), arts. 47–52 (*International Legal Materials*, vol. XIII, No. 2, 1974, pp. 259–260). See also *Yearbook . . . 1974*, vol. II (Part Two), p. 299, document A/CN.4/274, para. 121.

[429] However, art. 3 of the Treaty, listing "as a guide" to the parties' joint commission an order of use preferences, concludes with this statement: "All of the foregoing uses shall be subject to any sanitary measures or works which may be mutually agreed upon by the two Governments, which hereby agree to give preferential attention to the solution of all border sanitation problems" (United Nations, *Treaty Series*, vol. 3, p. 320).

[430] Minute No. 242, 30 August 1973, approved by both Governments by an exchange of notes of same date (*International Legal Materials*, vol. XII, No. 5, 1973, pp. 1105–1107). The same minute provides, in clause 6: "With the objective of avoiding future problems, the United States and Mexico shall consult with each other prior to undertaking any new development of either the surface or the groundwater resources, or undertaking substantial modifications of present developments, in its own territory in the border area that might adversely affect the other country" (*ibid.*, pp. 1106–1107). On the future use problem generally, see Bourne, "The right to utilize the waters of international rivers", *loc. cit.*, p. 184.

Canada and the United States of America,[431] the record seems clear that pollution monitoring and pollution control measures have acquired a permanent place in the principles governing the relations of States with respect to their shared water resources.

3. Doctrinal developments

259. Doctrinal developments have kept pace with the practice of States in this sphere. The latest effort at affirmation of the prevailing international law on the question is by the Institute of International Law. At its Athens session of 1979, the Institute approved a resolution entitled "The pollution of rivers and lakes and international law". It merits close consideration. The resolution reads:[432]

The Institute of International Law,

Recalling its resolutions of Madrid in 1911 and of Salzburg in 1961;

Conscious of the multiple potential uses of international rivers and lakes and of the common interest in a rational and equitable utilization of such resources through the achievement of a reasonable balance between the various interests;

Considering that pollution spread by rivers and lakes to the territories of more than one State is assuming increasingly alarming and diversified proportions whilst protection and improvement of the environment are duties incumbent upon States;

Recalling the obligation to respect the sovereignty of every State over its territory, as a result of which each State has the obligation to avoid any use of its own territory that causes injury in the territory of another State,

Hereby adopts the following articles:

Article I

1. For the purpose of this resolution, "pollution" means any physical, chemical or biological alteration in the composition or quality of waters which results directly or indirectly from human action and affects the legitimate uses of such waters, thereby causing injury.

2. In specific cases, the existence of pollution and the characteristics thereof shall, to the extent possible, be determined by referring to environmental norms established through agreements or by the competent international organizations and commissions.

3. This resolution shall apply to international rivers and lakes and to their basins.

Article II

In the exercise of their sovereign right to exploit their own resources pursuant to their own environmental policies, and without prejudice to their contractual obligations, States shall be under a duty to ensure that their activities or those conducted within their jurisdiction or under their control cause no pollution in the waters of international rivers and lakes beyond their boundaries.

Article III

1. For the purpose of fulfilling their obligation under article II, States shall take, and adapt to the circumstances, all measures required to:

(*a*) prevent any new form of pollution or any increase in the existing degree of pollution; and

(*b*) abate existing pollution within the best possible time limits.

2. Such measures shall be particularly strict in the case of ultra-hazardous activities or activities which pose a danger to highly exposed areas or environments.

Article IV

In order to comply with the obligations set forth in articles II and III, States shall in particular use the following means:

(*a*) at national level, enactment of all necessary laws and regulations and adoption of efficient and adequate administrative measures and judicial procedures for the enforcement of such laws and regulations;

(*b*) at international level, co-operation in good faith with the other States concerned.

Article V

States shall incur international liability under international law for any breach of their international obligations with respect to pollution of rivers and lakes.

Article VI

With a view to ensuring an effective system of prevention and of compensation for victims of transboundary pollution, States should conclude international conventions concerning in particular:

(*a*) the jurisdiction of courts, the applicable law and the enforcement of judgments;

(*b*) the procedure for special arrangements providing in particular for objective liability systems and compensation funds with regard to pollution brought about by ultra-hazardous activities.

Article VII

1. In carrying out their duty to co-operate, States bordering the same hydrographic basin shall, as far as practicable, especially through agreements, resort to the following ways of co-operation:

(*a*) inform co-riparian States regularly of all appropriate data on the pollution of the basin, its causes, its nature, the damage resulting from it and the preventive procedures;

(*b*) notify the States concerned in due time of any activities envisaged in their own territories which may involve the basin in a significant threat of transboundary pollution;

(*c*) promptly inform States that might be affected by a sudden increase in the level of transboundary pollution in the basin and take all appropriate steps to reduce the effects of any such increase;

(*d*) consult with each other on actual or potential problems of transboundary pollution of the basin so as to reach, by methods of their own choice, a solution consistent with the interests of the States concerned and with the protection of the environment;

(*e*) co-ordinate or pool their scientific and technical research programmes to combat pollution of the basin;

(*f*) establish by common agreement environmental norms, in particular quality norms for the whole or part of the basin;

(*g*) set up international commissions with the largest terms of reference for the entire basin, providing for the participation of local authorities if this proves useful, or strengthen the powers or co-ordination of existing institutions;

(*h*) establish harmonized, co-ordinated or unified networks for permanent observation and pollution control;

(*i*) develop safeguards for individuals who may be affected by polluting activities, both at the stages of prevention and compensation, by granting on a non-discriminatory basis the greatest access to judicial and administrative procedures in States in which such activities originate and by setting up compensation funds for ecological damage the origin of which cannot be clearly determined or which is of exceptional magnitude.

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[431] *United States Treaties and other International Agreements* (*op. cit.*), p. 1383. See also the parties' 1972 Agreement on Great Lakes water quality (United Nations, *Treaty Series*, vol. 837, p. 213); and "Pollution in the Great Lakes Basin from land use activities" (International Joint Commission, *1980 Annual Report* (Windsor, Ontario), p. 16).

[432] *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, pp. 196–203 (the resolution is reproduced in French and English, the French text being the authentic one). For the record of discussion and refinement of the provisional and final reports prepared by J. J. A. Salmon ("La pollution des fleuves et des lacs et le droit international"), *ibid.*, p. 104 and *ibid.*, Part One, p. 193. The "Salzburg resolution" of the Institute, on utilization of non-maritime international waters except for navigation, focused on "maximum utilization" of the available resources "of interest to several States" and emphasized "consultation", "plans established in common" and "reciprocal concessions" (preamble) (*Annuaire de l'Institut de droit international, 1961*, vol. 49, Part Two, p. 370). Disagreements are to be settled "on the basis of equity" (art. 3) (*ibid.*, p. 371).

Article VIII

In order to assist developing States in the fulfilment of the obligations and in the implementation of the recommendations referred to in this resolution, it is desirable that developed States and competent international organizations provide such States with technical assistance or any other assistance as may be appropriate in this field.

Article IX

This resolution is without prejudice to the obligations which fundamental human rights impose upon States with regard to pollution occurring in their own territories.

260. An article by article analysis of the Institute's imposing product will not be undertaken in this report, but a few observations may be in order. It is not proposed that the Commission venture to recommend to States the measures to be undertaken in municipal law in implementation of obligations of international law.[433] As sound as the Institute's listed means and ways may be, certainly these and indeed other measures of a specific nature, consistent with the Commission's approach to the topic, are to be left to system agreements, as the system States deem appropriate, not only in satisfaction of their international obligations but also in furtherance of their concerted efforts to achieve optimum utilization with minimum detriment to one another in the process.

261. Chapter 3 of the Helsinki Rules of the International Law Association, chiefly an attempt to restate binding rules but with some recommendatory clauses, deals with pollution in these terms:

Article X

1. Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State

(*a*) must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial injury to the territory of a co-basin State, and

(*b*) should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no substantial damage is caused in the territory of a co-basin State.

2. The rule stated in paragraph 1 of this article applies to water pollution originating:

(*a*) within a territory of the State, or

(*b*) outside the territory of the State, if it is cased by the State's conduct.

Article XI

1. In the case of a violation of the rule stated in paragraph 1 (*a*) of article X of this chapter, the State responsible shall be required to cease the wrongful conduct and compensate the injured co-basin State for the injury that has been caused to it.

2. In a case falling under the rule stated in paragraph 1 (*b*) of article X, if a State fails to take reasonable measures, it shall be required promptly to enter into negotiations with the injured State with a view towards reaching a settlement equitable under the circumstances.[434]

262. The aspect of responsibility for appreciable harm has already been dealt with in detail in this report (see sect. D above), in connection with a proposed special article on that aspect. Consequently those portions of the articles on pollution in the Helsinki Rules and the corresponding provisions in the "Athens resolution" of the Institute of International Law concerning harm will not be taken up directly in this section of the report. If appreciable harm is inflicted upon a co-system State, responsibility is incurred, unless the particular harm is permitted the system State causing the harm as part of its equitable participation (see paras. 41–81 and 156–157 above). In that regard, the Helsinki Rules are consistent with the articles herein proposed, that is, the requirements of article X of the Helsinki Rules are prefaced with the qualifying clause, "Consistent with the principle of equitable utilization . . .".[435]

4. New and existing pollution

263. Like the Institute's "Athens resolution",[436] the Helsinki Rules distinguish between two "categories" of pollution: existing and new.[437] With respect to "existing water pollution", a State *should* take "all reasonable measures to abate" to a level below "substantial damage", assuming that the offending system State's pollution is not allowable within its equitable utlilization, or equitable participation; the penalty attached to failure to take such measures is merely an obligation "promptly to enter into negotiations with the injured State" with a view to an agreed, equitable accommodation.[438] The Institute, on the other hand, prescribes, adapted to the circumstances, "all measures required" to "abate existing pollution within the best possible time limits".[439] Moreover, the Institute adds that these measures "shall be particularly strict in the case of ultra-hazardous activities or activities which pose a danger to highly exposed areas or environments".[440]

264. It is fair to say that international environmental law had not developed at the time the Helsinki Rules were being formulated. Thus the broader application and stronger language of the Institute's resolution, adopted 13 years later, is understandable and appears more accurately to reflect currently accepted norms. For the "Athens resolution", abatement of existing

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[433] Cf. the Helsinki Rules on the Uses of the Waters of International Rivers (ILA, *Report of the Fifty-second Conference* . . . p. 484).

[434] *Ibid.*, pp. 494–505, including commentary. The definition of pollution in art. IX of the Helsinki Rules will be considered later, in connection with that problem.

[435] See the commentary to that effect (ILA, *Report of the Fifty-second Conference* . . ., pp. 499–500), in which it is stated: "This duty, therefore, does not apply to a State whose use of the waters is consistent with the equitable utilization of the drainage basin", the authority cited being Jiménez de Aréchaga, *Curso de derecho internacional público* (Montevideo, Centro Estudiante de Derecho, 1961), pp. 532–534. The commentary states further:
"The principle of equitable utilization of the waters of an international drainage basin may require, in a particular case, that the several co-basin States participate jointly in the financing of pollution control measures".

[436] Art. III, para. 1.

[437] Art X, para. 1. At the fourteenth session of the Asian-African Legal Consultative Committee, the Standing Sub-Committee submitted for consideration a revised draft of its propositions on the law of international rivers. The pertinent part, proposition VIII, includes this first paragraph:
"Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial damage in the territory of a co-basin State, regardless of whether or not such pollution originates within the territory of the State" (Asian-African Legal Consultative Committee, *Report of the Fourteenth Session* . . (*op. cit.*), p. 105).

[438] Art. XI, para. 2.

[439] Art. III, para. 1 (*b*).

[440] Art. III, para. 2.

pollution is no longer merely a recommendatory proposition, even though the duty is softened by allowing a period of time within which to achieve the goal of abatement. Not qualified by a time period is the Institute's absolute, separate requirement that existing pollution not increase.[441] Indeed, the Institute's article does not contemplate residual or permissible pollution short of appreciable harm. The first substantive article of the resolution flatly states, in the absence of agreement with the affected State, an unqualified "duty to ensure that . . . *no** pollution" is caused in the water of international rivers and lakes beyond their boundaries.[442] And the preamble to the resolution is similarly unqualified, speaking of an "obligation to avoid any use of its own territory that causes injury in the territory of another State". Nonetheless, subsequently the resolution requires, "as far as practicable", accommodation of interests between or among system States, consistent with protection of the environment, where there are problems of actual or potential transboundary pollution.[443] As indicated, the resolution posits a separate concern for "ultra-hazardous activities or activities which pose a danger to highly exposed areas or environments", with regard to which measures are to be "particularly strict".[444] The Helsinki Rules contain no such provision; however, in the commentary to article X, a special paragraph is headed "(*e*) Danger to human life":

> If the activity or conduct causes pollution that endangers human life in another State, such activity or conduct would probably be deemed inconsistent with the principle of equitable utilization and the duty referred to in paragraph 1 (*b*) of this Article "to take all reasonable measures" could become an absolute duty to abate the pollution.[445]

265. The relevant Committee of the International Law Association, in a draft produced at its meeting in 1963, had made it, where equitable utilization of the waters would not be defeated thereby, not only a duty to prevent any new form of or any increase in the degree of existing pollution that would cause substantial injury, but also a duty "to take all reasonable measures to abate existing water pollution . . . to such an extent that no substantial injury is caused . . .".[446] At a subsequent meeting, the Committee retreated from that position to the above-quoted recommendation.[447] The counterpart committee of the Association's American Branch criticized this step as "unfortunate" and made these observations:

> . . . No reason seems apparent to accord existing pollution, in effect, the rank of a vested right, and it is in the opinion of this Committee that the appropriate and necessary international law rule on the subject was correctly stated in the [1963 draft].

> Placing a State under a duty to take "reasonable measures" against serious pollution, subject always to the limitation that it could not thereby be deprived of its own equitable utilization, would not seem unduly burdensome. Justice would seem to require no less. As the report on pollution . . . now reads, it is inconsistent with equitable utilization as we understand that principle, since it permits existing pollution to contiue although such pollution may well prevent an equitable utilization or, indeed, any utilization by co-riparian States. Moreover, advising a State that it is legally free to continue polluting if it has done so in the past is not conducive to cleaning up international rivers.
>
> Article [XI] (2), the remedies article, then takes the curious position that, if a State fails to follow the *recommendation* to take reasonable measures, . . . it comes under a *duty* "to enter into negotiations with the injured State . . .". It seems a strange formulation to have a duty arise as a consequence of a State's failure to take certain actions, which it was admittedly not legally obliged to undertake. Of course, placing existing pollution outside of existing international law regulation likewise nullifies the salutary compensation provisions for injury resulting from failure to take reasonable measures, which were contained in [the 1963] draft.[448]

266. Such marked divergence of opinion within the Association as existed in the early 1960s is less likely at the present time, for students of the topic generally have been persuaded that a duty simply to maintain the *status quo* with regard to the pollution of shared water resources is insufficient: that merely exhorting Governments to do something about existing pollution is an untenable position. The language of the "Athens resolution" of the Institute of International Law manifests that shift.

267. The dichotomy between existing and new pollution accepted both by the International Law Association and the Institute of International Law must be examined squarely.[449] As a practical matter, drawing the time line between existing and new pollution seems workable only in the case of agreement between the system States on an "effective date".[450] For a supposedly pre-existing customary rule of international law, there is no "coming into force" or other date that can be used as a reference point. "New sources of pollution arise almost daily as new industries develop and older industries expand and discharge greater quantities of wastes into overloaded streams", says the Helsinki Rules commentary.[451] But by the time the harm or hazard is identified, it may be argued that it is already an "existing" pollution.[452] And if the time has come to

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[441] Art. III, para. 1 (*a*), second phrase.

[442] Art. II. See P. M. Dupuy, "International liability of States for damage caused by transfrontier pollution" (OECD, *Legal Aspects of Transfrontier Pollution*, p. 353, para. 23): ". . . it is clear that such a prohibition could not in practice be taken as absolute . . . Thus there will always be some residual transfrontier pollution which may be regarded as lawful."

[443] Art. VII, para. 1 (*d*).

[444] Art. III, para. 2.

[445] ILA, *Report of the Fifty-Second Conference* . . ., p. 501.

[446] As reported by the Committee on Uses of Waters of International Rivers of the American Branch of the International Law Association (*Proceedings and Committee Reports of the American Branch of the International Law Association, 1963–1964* (New York), p. 35).

[447] *Ibid.*

[448] *Ibid.*, pp. 35–36.

[449] There are some examples of this duality in treaty practice. See e.g. the 1960 Convention of the protection of Lake Constance against pollution (Land of Baden-Württemberg, Free State of Bavaria, Austria and Switzerland), art. 1, para. 2: "The riparian States shall take in their territories the necessary measures to prevent an increase in pollution . . . and to improve as much as possible the sanitary condition of its waters" (United Nations, *Legislative Texts*, p. 439). Para. 1 of the article commits the riparian States "to co-operate in protecting the waters of Lake Constance against pollution". J. Zourek has argued: "The ambiguous formulation of the principle . . . has the effect of legalizing, not only for the present but also for the future, any pollution which does not exceed a tolerable level. That in my opinion is the sense of draft article 2 [submitted by J. J. A. Salmon]. This is unacceptable and represents a backward step even by comparison with the Stockholm Declaration" (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, p. 379).

[450] See the repeated use of this term in the carefully drafted Indus Waters Treaty of 1960, e.g. in art. IV (United Nations, *Treaty Series*, vol. 419, p. 136). The term is defined in art. 1, para. (16) (*ibid.*, p. 130).

[451] Commentary to art. IX (ILA, *Report of the Fifty-second Conference* .. ., p. 496).

[452] For example, would the pollution involved in the *Trail Smelter*

articulate the duty of system States to abate all forms of pollution to levels below those that cause appreciable harm to co-system States—subject always to the possible permissibility of appreciable harm within an equitable participation determination—the need formerly felt by some jurists to distinguish between old and new pollution would not obtain.

268. In any event, the majority of relevant treaties do not deal with pollution in terms of existing/new, or past/future, and most specialists no longer conceptualize the problem in that fashion.[453]

5. Pollution regulation on the basis of hazard

269. What *has* come to the fore is the differentiation among different kinds of pollutants, particularly with respect to the gravity of the hazard they present in given concentrations.[454] And some "existing" pollution may be allowed as part of an equitable participation determination that protects certain existing (beneficial) uses.[455] That is to say that the apprehension, especially of upstream industrialized States, that their polluting industries may be made non-competitive if severe pollution controls are imposed upon current processes, can receive a hearing in the larger context of each system State's equitable participation.[456]

270. One student of the subject has differentiated water pollution into five general categories on the basis of what produces the pollution:

(*a*) The addition of non-toxic solid matter;
(*b*) The addition of non-toxic salts;
(*c*) Deoxygenation;
(*d*) Heating of the waters, and
(*e*) The addition of toxic substances.[457]

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arbitration (United Nations, *Reports of International Arbitral Awards*, vol. III . . ., pp. 1905–1910) be classified as existing, or new? Had there been pollution of which Spain could have complained in the *Lake Lanoux* arbitration (*ibid.*, vol. XII . . ., p. 285), how would it have been regarded?

[453] Even the commentary to the Helsinki Rules, developed essentially for the earlier, stronger version of the provision on existing pollution, offers no support for the bifurcation. On the contrary, the commentary makes a consistent case for abatement, at least to within the permissible levels. The illustration given under sub-heading (*b*) "New or increased pollution", in the commentary, hypothesizes use by adjacent co-basin States for drinking purposes; the upper basin State "builds a number of slaughterhouses along the banks of a river in the basin", the discharge from which renders the water no longer suitable for drinking in the lower riparian State; the upper basin State "is, required to abate the pollution" (ILA, *Report of the Fifty-second Conference* . . ., pp. 509–503). Under sub-heading (*d*), "Existing pollution", the illustration is that:

"State A has for many years utilized the waters of an international drainage basin for the disposal of sewage, causing repeated typhoid epidemics in the territory of co-basin State B. As a result of urbanization, the level of the pollution is greatly increased. State A is required to abate the increase and should take reasonable measures to reduce the prior pollution . . ." (*ibid.*, p. 504). Today, pollution causing "repeated typhoid epidemics" would, it is believed, constitute appreciable harm and State A would be under a general duty to abate, irrespective whether the pollution was longstanding (as postulated in the illustration) or only recently practised, which might also be construed as already existing. Only if State B *anticipates* the epidemics with a charge of threatened pollution, which might not be within its capabilities, could this (potential) pollution, it is submitted, be incontestably characterized as "new". It may be significant that the commentary does not offer treaty precedent or real cases drawing the distinctions enshrined in the rule. On the other hand, in the third principle set out in an annex entitled "Some principles concerning transfrontier pollution", formulated by OECD in 1974, countries "should endeavour to prevent any increase in transfrontier pollution, including that stemming from new or additional substances and activities, and to reduce and as far as possible to eliminate any transfrontier pollution existing between them within time limits to be specified" (OECD, *Legal Aspects of Transfrontier Pollution* (*op. cit*), p. 14, para. 3). This language follows, however, the second principle, which gives no hint of or basis for the distinctions: "Pending the definition of . . . concerted long-term policies, countries should, individually and jointly, take all appropriate measures to prevent and control transfrontier pollution and harmonize as far as possible their relevant policies" (*ibid.*, para. 2). Read together, these two principles are open to the interpretation that the problem for system States in an industrialized region being so vast, not all fronts in the battle against pollution can, as a practical matter, be attacked simultaneously. First things first, therefore: endeavour to hold the line against the introduction of additional contaminants and contaminating activities, while the studies on already existing problems may be completed and evaluated, and the will and capabilities of the system States concerned ascertained. Art. 2 of the 1969 draft European convention on the protection of fresh water provided:

"Contracting States shall take measures to abate any existing pollution and to prevent any new form of water pollution or any increase in the degree of existing water pollution causing or likely to cause substantial injury or damage in the territory of any other contracting State . . ." (Council of Europe, Consultative Assembly, recommendation 555 (1969) (doc. 2561)), reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 344, document A/CN.4/274, para. 374.

The preamble to the draft showed concern for industrial competitiveness:

"*Considering* that the cost of measures . . . should be distributed as fairly as possible in order not to disturb the relative competitive positions of European industries"

and yet twice iterates the *sic utere tuo* principle without qualification

"*Considering* that it is a general principle of international law that no country is entitled to exploit its natural resources in a way that may cause substantial damage in a neighbouring country";

"*Considering also* that it is a fundamental principle of law that any person who enjoys the use of property in common with other persons must not interefere with such enjoyment by other persons and is liable to pay compensation for any damage so caused".

For relevant international agreements, see, *inter alia*, *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, pp. 317–329, annex IV to the provisional report by J. J. A. Salmon (list of conventions consulted); "International and intrafederal commissions dealing with transfrontier pollution in hydrographic basins", report by the secretariat of the OECD Environment Committee, and annexed tables on 26 international commissions with transfrontier jurisdiction and four interstate or interprovince commissions) (OECD, *Transfrontier Pollution and the Role of States* (*op. cit.*), pp. 133–189).

[454] See e.g. the 1976 Convention on the protection of the Rhine against chemical pollution, annexes I, II and III (*International Legal Materials*, vol. XVI, No. 2, 1977, pp. 253–255) (to be issed as No. 17511 in the United Nations *Treaty Series*), and the 1980 Protocol for the protection of the Mediterranean sea against pollution from land-based sources, annexes I, II and III (*ibid.*, vol. XIX, No. 4, 1980, pp. 875–878).

[455] See *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, p. 225 (statement by M. S. McDougal).

[456] But see the observations of J. Žourek, especially the following: "The principle of equitable sharing of water resources can never prevail over the rules prohibiting pollution. This truth should be stated clearly in the regulations to be prepared. It must be borne in mind that a violation of the rule prohibiting pollution is at the same time a violation of human rights and that not only States are involved" (*ibid.*, p. 315, para. 8); and: "There is no comparison between the pollution of the past and modern pollution, which in the space of a generation has made sewers of all major rivers, which continues to degrade the atmosphere to the point where historical monuments that had stood for more than 2,000 years are now crumbling, and which is responsible for the disappearance of life from broad expanses of the sea, not to mention the dangers of nuclear pollution which threatens future generations because of our rushing to use atomic power without resolving the problem of vital concern to mankind, namely, the problem of radioactive waste. Sources of pollution and their level of injuriousness have changed completely and, in my view, one cannot make that an excuse for legalizing the old forms of pollution, which were simply tolerated and were not a right" (*ibid.*, pp. 315–316, para. 9).

[457] Žourek *ibid.*, p. 379), based on H. B. Hynes, *The Biology of Polluted Waters* (Liverpool University Press, 1963), p. 64. K.

(*Continued on next page.*)

In other documents, the division into two lists has become common: "black" for the most threatening, or toxic contaminants; "grey" for those less so but meriting monitoring and control.[458] Clearly in this context the attempt to consider some pollution as new and other pollution as existing is ephemeral, if not missing the point and confounding those charged with the development or application of pollution control measures. The technical view is that it is far more important to distinguish between grades or gravities of threat—and not forgetting cumulative effects and even the possibly radically serious effect of two or more contaminants when they combine in the same watercourse.[459]

271. In the field of water pollution generally, as well as with respect to environmental matters, the technical problems are so complex that considerable international effort is often called for before effects can be accurately determined or practical measures can be devised for control or abatement. Some situations may be regarded as so threatening that interim measures may be adopted pending further clarification of the matter. The Council of OECD adopted recommended principles concerning transfrontier pollution in 1974. Under the heading "International solidarity", countries were urged to "define a concerted long-term policy for the protection and improvement of the environment in zones liable to be affected by frontier pollution", and, in implementation of this "concerted policy" they should, among other things:

(*a*) Take account of:

levels of existing pollution and the present quality of the environment concerned;

the nature and quantities of pollutants;

the assimilative capacity of the environment, as established by mutual agreement by the countries concerned, taking into account the particular characteristics and use of the affected zone;

activities at the source of pollution and activities and uses sensitive to such pollution;

the situation, prospective use and development of the zones concerned from a socio-economic standpoint;

(*b*) Define:

environmental quality objectives and corresponding protective measures;

(*c*) Promote:

guidelines for a land-use planning policy consistent with the requirements both of environmental protection and socio-economic development;

(*d*) Draw up and maintain up to date:

(i) lists of particularly dangerous substances regarding which efforts should be made to eliminate polluting discharges, if necessary by stages, and

(ii) lists of substances regarding which polluting discharges should be subject to very strict control.[460]

In this delineation of relevant recommendations, not only is the now common "overlay" from the environmental field seen, but it becomes clear that a merely static prohibition against pollution, new and existing, will not suffice, above all under industrialized conditions. Yet the extent to which a "residual" rule of international law may properly prescribe active collaboration against the common "enemy", pollution, is not easily settled. An article not recognizing in some measure the inherent dynamics of the problem, it must be acknowledged, would almost certainly fail to have meaningful application as between most system States within a few decades. In any event, a cardinal requirement must be the sharing of information and data among system States in order that the technical picture may be pieced together, revealing the kinds, extent and effects of pollution already present in shared water resources.[461]

272. In recognition of the dynamic dimensions of the problems of pollution of international watercourses, a number of international river commissions have been charged with pollution responsibilities, or special commissions have been set up.[462] The Consultative Assembly of the Council of Europe adopted "Guiding princi-

(*Footnote 457 continued.*)

Cuperus arrived at this classification of the main sources of pollution: (i) organic matters originating from domestic and industrial wastes; (ii) inorganic salts, originating from industry; (iii) bacteria and other organisms; (iv) specific toxic substances; (v) mineral oils; and (vi) radio-active substances (reproduced in Lester, "Pollution", *The Law of International Drainage Basins* (*op. cit*), p. 90). With respect to water quality, this differentiation is instructive: "In case of domestic supplies, the required analysis is generally prescribed by regulation or ordinances relating to public health. Water for industrial use must be suitable for the special processes involved. Irrigation water must not contain objectionable salts, solids and other substances, dissolved and suspended beyond certain limits. Surface waters utilized for recreation purposes must be free from pollutional materials creating a nuisance and from pathogenic bacteria while those for fish breeding should be free from toxic substances and should meet necessary standards as to dissolved oxygen" (United Nations, *Multipurpose river basin development—Part 1: Manual of river basin planning*, Flood Control Series No. 7 (Sales No. 1955.II.F.1), pp. 24–25).

[458] On agreed standards, see e.g. the 1960 Treaty between Belgium and the Netherlands concerning the improvement of the Terneuzen and Ghent Canal, etc., providing that the parties shall ensure that the waters of the canal and in the vicinity of the frontier meet the standards of quality set forth in an annex (art. 27), agree to co-operate in order to determine the extent of radioactivity in the waters (art. 29), instruct their respective technical services to make regular observations and to submit a joint report (art. 31), and ensure that the fresh water/salt water mix is in a specified proportion (art. 32) (United Nations, *Treaty Series*, vol. 423, pp. 65–66).

[459] In this general connection, see the summary of the statement of N. Ushakov during the discussion in Athens of the draft articles as proposed by J. J. A. Salmon, in which he "regretted the impreciseness of art. 2. In particular, it was not clear what the expression 'new sources of pollution' covered. It was also very vague to speak of 'the increase in the existing level of pollution' or to specify an obligation to 'reduce, as soon as possible, existing pollution'. He emphasized that pollution should be considered primarily from the standpoint of the basic needs of human life, especially the need for drinking water" (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 122).

[460] OECD, *Legal Aspects of Transfrontier Pollution* (*op. cit.*), pp. 13–14.

[461] The system States of the Niger, in establishing the Niger River Commission by their Agreement of 1964, not only undertook, in order "to achieve maximum co-operation", to inform the Commission "at the earliest stage" of all studies and works upon which they proposed to embark and to abstain from any works likely to pollute the waters, or any modification likely to affect the biological characteristics of its fauna and flora, without adequate notice to and prior consultation with the Commission (art. 12), but also assigned to the Commission the tasks, *inter alia*, of collecting, evaluating and disseminating basic data on the whole of the basin (art. 2 (*c*)) (United Nations, *Treaty Series*, vol. 587, pp. 27 and 23.) In art. 29(2) of their 1954 Agreement, Czechoslovakia and Hungary agreed as follows: "The contracting parties shall communicate to each other their experience with pollution-abatement measures on frontier watercourses". (*ibid.*, vol. 504, p. 274). On information and data sharing generally, see sect. E of this chapter.

[462] See e.g. the 1963 Agreement between France, the Federal Republic of Germany, Luxembourg, the Netherlands and Switzerland creating the International Commission for the Protection of the Rhine against Pollution (*Yearbook . . . 1974*, vol. II (Part Two), p. 301, document A/CN.4/274, paras. 138–141); the 1978 Canada-United States Great Lakes Water Quality Agreement (*United States Treaties and other International Agreements* (*op. cit.*), p. 1383).

ples applicable to fresh water pollution control" in 1965, the final item of which states: "A special body for water pollution control should be set up for each international drainage area . . ."[463] In its European Water Charter, the Council of Europe devotes several sections to pollution considerations:

III. *To pollute water is to harm man and other living creatures which are dependent on water*

Water in nature is a medium containing beneficial organisms which help to keep it clean. If we pollute the water, we risk destroying those organisms, disrupting this self-purification process, and perhaps modifying the living medium unfavourably and irrevocably.

Surface and underground waters should be preserved from pollution.

Any important reduction of quantity and deterioration of quality of water, whether running or still, may do harm to man and other living creatures.

IV. *The quality of water must be maintained at levels suitable for the use to be made of it and, in particular, must meet appropriate public health standards*

These quality levels may vary according to the different uses of water, namely food supplies, domestic, agricultural and industrial needs, fisheries and recreation. Nevertheless, since all life on earth in its infinite variety depends upon the manifold qualities of water, arrangements should be made to ensure as far as possible that water retains its natural properties.

V. *When used water is returned to a common source it must not impair the further uses, both public and private, to which the common source will be put*

Pollution is a change, generally man-made, in the quality of water which makes it unusable or dangerous for human consumption, industry, agriculture, fishing, recreation, domestic animals and wildlife.

The discharge of residue (wastage) or of used water which causes physical, chemical, organic, thermal or radio-active pollution, must not endanger public health and must take into account the capacity of the receiving waters to assimilate (by dilution or self-purification) any waste matter discharged. The social and economic aspects of water-treatment methods are of great importance in this connection.

IX. *Conservation of water calls for intensified scientific research, training of specialists and public information services*

Research with regard to water in general and waste water in particular should be encouraged in every way possible. Means of providing information should be increased and international exchange facilitated; at the same time, the technical and biological training of qualified personnel is necessary in the various fields of activity involved.[464]

273. In the 1969 draft European convention on the protection of fresh water against pollution of the Consultative Assembly of the Council of Europe, some provisions not yet cited appear of particular interest:

. . . [Pollution abatement] measures shall be designed to preserve, to the maximum extent possible, the qualities of the waters of international drainage basins in order to safeguard public health and to permit their use, after such economically justified treatment as may be necessary, in particular for:

(*a*) The production at a reasonable cost of drinking water of good quality;

(*b*) The conservation and development of aquatic resources, including both fauna and flora;

(*c*) The production of water for industrial purposes;

(*d*) Irrigation;

(*e*) Use by domestic animals and wild life;

(*f*) Recreational amenities, with due regard to health and aesthetic requirements.[465]

In effectively implementing the above, contracting States would:

(*a*) Wherever possible, agree to establish and maintain standards of quality for the waters of an international drainage basin extending over their territories;

(*b*) Where appropriate in the circumstances, establish joint commissions to regulate usage of such waters;

(*c*) Inform the other contracting States about standards in force under paragraph (*a*);

(*d*) From time to time inform and consult with other contracting Stages concerned, about the usages of such waters;

(*e*) Adopt legislative and administrative measures to implement this Convention within their respective territories.[466]

274. The 1974 draft European convention for the protection of international water courses against pollution contains these pertinent provisions:

Article 2

Each Contracting Party shall endeavour to take, in respect of all surface waters in its territory, all measures appropriate for the reduction of existing water pollution and for the prevention of new forms of such pollution.

Article 3

1. Each Contracting Party undertakes, with regard to international watercourses, to take:

(*a*) All measures required to prevent new forms of water pollution or any increase in the degree of existing water pollution;

(*b*) Measures aiming at the gradual reduction of existing water pollution.

2. This Convention is not to lead to the replacement of existing measures by measures giving rise to increased pollution.

Article 4

1. Each Contracting Party shall take all measures appropriate for maintaining the quality of the waters of international watercourses at, or for raising it to, a level not lower than:

(*a*) The specific standards referred to in article 15, paragraph 2: or

(*b*) In the absence of such specific standards, the minimum standards laid down in appendix I to this Convention, subject to any derogation provided for in paragraph 2 of the present article.

2. The minimum standards laid down in appendix I shall be applied:

(*a*) In the case of freshwater standards, at the freshwater limit and at each point upstream from this limit where the watercourse is crossed by a frontier between States;

None the less, at the 1981 Dakar Interregional Meeting, it was concluded that:

"Water quality, water-related disease and environmental protection considerations have to date received inadequate attention in most cases, and Governments need to request their river and lake organizations to include these aspects as part of their information and data, project and programme planning or monitoring functions, as appropriate (United Nations, *Experiences in the Development and Management* . . ., p. 14, para. 49, topic II, conclusion 4).

See also, Hayton, "Progress in co-operative arrangements" (*ibid.*, pp. 65 *et seq.*), and agreements and works there cited, in particular sect. A (*a*), "Pollution control and health management" (*ibid.*, pp. 70–71).

[463] Para. 12 (Council of Europe, Consultative Assembly, recommendation 436 (1965) (doc. 1965) on fresh water pollution control in Europe), reproduced in *Yearbook . . . 1974*, vol. I (Part Two), p. 342, document A/CN.4/274, para. 372. Para. 4 of the preamble to the recommendation provides: "International co-operation in the field of water pollution control, in particular with regard to research, training of experts and exchange of information, should be strengthened . . .".

[464] *Ibid.*, p. 343, para. 373. The European Water Charter was adopted in 1967 and proclaimed in Strasbourg in 1968.

[465] Art. 2, para. 1 (*ibid.*, p. 344, para. 374).

[466] Art. 2, para. 2 (*ibid.*).

(*b*) In the case of brackish water standards, at the baseline of the territorial sea and at the points where the estuary is crossed by a frontier between States;

3. Derogations to the application of appendix I at the points fixed by the previous paragraph are authorized for the watercourses and the parameters listed in appendix IV to this Convention. The contracting parties riparian to such a watercourse shall co-operate with each other in accordance with the provisions of article 10.

Article 5

1. The discharge into the waters of international hydrographic basins of any of the dangerous or harmful substances listed in appendix II to this Convention shall be prohibited or restricted under the conditions provided for in that appendix.

2. In so far as a contracting party cannot immediately give effect to the provisions of the preceding paragraph, it shall take steps to comply with them in a reasonable time.

Article 6

1. The provisions of articles 3 and 4 may not be invoked against a contracting party to the extent that the latter is prevented, as a result of water pollution having its origin in the territory of a non-contracting State, from ensuring their full application.

2. However, the said contracting party shall endeavour to co-operate with the non-contracting State so as to make possible the full application of these provisions.

Article 8

The contracting parties undertake to co-operate with each other with a view to achieving the aims of this Convention.

Article 9

The contracting parties riparian to an international watercourse to which the minimum standards laid down in appendix I to this Convention are to be applied and the waters of which do not yet meet the level of these standards shall advise each other of the measures they have taken with a view to reaching, within a fixed time-limit, this level at the points fixed by article 4, paragraph 2.

Article 10

1. The contracting parties situated either upstream or downstream of a point on an international watercourse at which the derogations provided for in article 4, paragraph 3, apply, shall carry out, in consultation with each other and before the end of the first year after this Convention enters into force in respect of them, an inquiry with a view to establishing the quality of the waters at this point as regards the parameters covered by the derogation.

2. The contracting parties riparian to such a watercouse shall jointly establish a programme designed to achieve, within a fixed time-limit, certain objectives for reducing pollution at the point referred to in the preceding paragraph. This programme may envisage various stages, each reaching intermediate objectives. A comparison shall be effected between the objectives envisaged and the results obtained at the expiration of the fixed time-limits.

3. If the inquiry or the results mentioned in the preceding paragraphs show that it is no longer necessary to maintain the derogation as regards one of the parameters, the contracting party which requested the derogation shall notify the Secretary-General of the Council of Europe of its suppression as regards that parameter.

Article 11

As soon as a sudden increase in pollution is recorded, the contracting parties riparian to the same watercourse shall immediately warn each other, and shall take unilaterally or jointly all measures in their power to avert injurious consequences or to limit the extent thereof, having recourse to the early warning system envisaged in article 15 . . .

Article 12

1. The [interested] contracting parties . . . undertake to enter into negotiations with each other, if one of them so requests, with a view to concluding a co-operation agreement or to adapting existing co-operation agreements to the provisions of this Convention.

2. When the interested contracting parties admit expressly or tacitly that the contribution of one of them to the pollution of the international watercourse can be deemed negligible, the latter contracting party is not bound to enter into negotiations . . .[467]

6. The trend towards pollution management by commission

275. Article 14 of the 1974 draft European convention requires the establishment of an international commission as part of the co-operation agreement referred to in article 12, quoted above, unless the parties decide otherwise.[468] The functions of commissions so established are spelled out in some detail. These include collection and verification at regular intervals of data concerning water quality, proposal of additional investigations to establish the nature, degree and source of pollution, proposal of an early warning system for serious accidental pollution, and proposal of additional measures and inquiries and programmes.[469]

276. ECE adopted in 1966 a series of principles as part of an ECE policy declaration on water pollution control. Two of these principles are additional evidence of the growth of international understanding of the problem.

1. Water pollution control constitutes a fundamental governmental responsibility and calls for close international collaboration . . . All problems concerning the rational utilization of water resources should be viewed in relation to the special features of each drainage basin.

. . .

9. States bordering on the same surface water should reach an understanding to the effect that such water represents for them a common asset, the use of which should be based on the desire to reconcile their respective interests to the greatest possible extent. This involves more particularly concerted action in pollution control, and such States should, by means of bilateral or multilateral agreements, define their mutual relations on water pollution. These agreements should provide that States are to maintain water at a

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[467] Council of Europe, Consultative Assembly, doc. 3417 (1974), reproduced in *Yearbook . . . 1974*, vol. II (Part Two), pp. 346-347, document A/CN.4/274, para. 377.

[468] *Ibid.*, p. 347.

[469] Art. 15, para. 1 (*ibid.*). The Consultative Assembly of the Council of Europe had previously adopted recommendation 629 (1971) (doc. 2904) on the pollution of the Rhine valley water-table, the preamble to which included these important statements:

"*Considering* that the efficacy of fresh water pollution control depends on the acceptance of certain principles by as many countries as possible, . . . and in general calls for concerted action within a given drainage basin . . .";

"*Reaffirming* that most environmental problems, including water pollution, are of an international character";

"*Noting* in this connection that the Rhine valley water-table is not only the most important fresh water reservoir in Europe but also the indivisible asset of a number of European countries";

"*Noting* that . . . pollution increasingly threatens this vital fresh water reserve";

"*Noting further* that the management of this water reserve and its safeguarding against pollution are tasks whose effective accomplishment can only be ensured jointly by all countries bordering on it . . .";

and

"*Emphasizing* the urgent need for such co-operation, which is a proof of both the solidarity existing between frontier regions and the practical nature of the problems calling for common action" (*ibid.*, p. 349, para. 378).

quality such that neither public health nor the basic needs of the economy are jeopardized.[470]

277. The preamble to the ECE recommendation concerning river basin management of 1971 includes these statements:

Rapid industrial development and intensive urbanization, together with increased standards of living throughout the last decades, have resulted in ever higher demands for water and an increasing deterioration of the environment in virtually all ECE countries. These growing demands, including more stringent needs for high quality water, in conjunction with the natural fluctuations and the growing pollution of the water resources, have caused water shortages to occur in more and more regions. In certain areas water has thus become a determining factor in the location of water-using industries, and a shortage of it is considered a limiting factor in economic and social development. It is accepted that only careful planning and rational management of the allocation, utilization and conservation of water resources . . . can assure that requirements will be met in the future and that the natural environment will be improved and preserved.[471]

The Governments of southern Europe, in a 1971 ECE recommendation, are urged to strengthen "international co-operation in water management, especially in the protection of quality, above all in countries sharing a river basin".[472]

278. One student of the international problem, after formulating two "optimum rules", listed the following two implementation rules he regarded as necessary on frontier waters:

(*a*) The quality of waters should be determined for a given time (in comparison with which any new forms of pollution and any increase in the degree thereof should be prevented);

(*b*) The quality of "pure water" should be specified (this water quality must be reached through gradual reduction of the existing water pollution).[473]

Moreover, if certain conditions are met, there is "a realistic possibility of pollution control". Some of these conditions are:

(*a*) Polluted water should only be discharged with permission from a competent authority, according to the national legal system of the concerned countries. In the licences, the level of sewage treatment should be prescribed and adequate measures should be applied against those who do not meet these requirements.

(*b*) Identical methods should be applied for the sampling, analysis, evaluation and classification of water quality; that is, data obtained in one country should be comparable with those of the other country;

(*c*) The possibility of solving problems related to the planning, construction and operation of treatment plants and to the sharing of costs related to the establishment and operation thereof should be spelt out.[474]

279. In its report on pollution in the waters of the St. Clair River, Lake St. Clair and the Detroit River, the International Joint Commission (Canada–United States of America) pointed out the changes which had occurred since its original study of river pollution, beginning in 1913, and concluded as follows:

The pollution problem must be considered not only on the basis of present-day conditions but also in terms of the future. Facilities for the treatment of municipal sewage must incorporate sufficient flexibility to permit of ready expansion to satisfy future demands. Industrial waste disposal programmes must not only provide adequate treatment for the present, but they must ensure that new industries or new industrial processes which may be established will not jeopardize the rights of users of these waters.[475]

The Commission found that water of a certain quality was required for each water use; the system States had to approve a set of water quality objectives before the necessary remedial measures could be worked out.[476] Under the then prevailing conditions, it regarded it as impossible accurately to determine the relative responsibilities of the system States for transboundary pollution.[477]

280. Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Romania and the Soviet Union have approved common criteria and standards of purity for surface waters and water classification principles by way of the Conference of Heads of Water Management Services of the member countries of CMEA.[478] In Western Europe, a special Convention on the protection of the Rhine against chemical pollution has been concluded.[479] This Convention adopts the modern technique of listing polluting substances, classified as to their gravity as pollutants. Dangerous substances, with respect to which the parties will take appropriate measures to eliminate their discharge into the Rhine, are identified in annex I of the Convention.[480] Pollution by this group of sub-

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[470] ECE resolution 10(XXI) of 29 April 1966, appendix (*Official Records of the Economic and Social Council, Forty-first Session, Supplement No. 3* (E/4177), pp. 61–62).

[471] E/ECE/WATER/9, annex II.

[472] ST/ECE/WATER/6/Add.1, p. 11, para. 5 (*d*).

[473] E. Prehoffer, "Legal framework of co-operation in the field of water management between Hungary and its neighbouring countries", *River Basin Development . . .*, vol. II . . ., p. 46. The author cites two rules, expressly based on principle 21 of the Stockholm Declaration as affirmed by General Assembly resolution 2996 (XXVII) of 15 December 1972:

"(*a*) The co-basin States should take all measures required to prevent new forms of water pollution or any increase in the degree of existing water pollution;

"(*b*) Those States should take all measures directed towards the gradual reduction of existing water pollution".

Although neither the treaty practice adduced in the study nor principle 21 conforms to the rules cited, the practical problems aired certainly indicate the need for pollution abatement over time. How the distinctions would be made, failing agreements, the author does not discuss.

[474] *Ibid.*

[475] International Joint Commission, *Report on the Pollution of Boundary Waters*, 1951, p. 72.

[476] *Ibid.*, pp. 169–170.

[477] *Ibid.*, p. 166. The two Governments approved the Commission's proposals regarding the quality control objectives of boundary waters and decided to monitor the waters by international control boards as well as by means of their national agencies. See "Measures to control pollution authorized in Great Lakes area", *The Department of State Bulletin* (Washington, D.C.), vol. XXV, No. 650, 10 Dec. 1951, p. 947.

[478] A. Wolman, "Pollution as an international issue", *Foreign Affairs* (New York), vol. 47, No. 1, 1968, p. 164; "Co-operation among CMEA member countries in long-term water management planning", paper presented by the Soviet Union at the United Nations Workshop on Water Resources Planning Experiences in a National and Regional Context (Castlegondolfo, Italy, 18–29 June 1979) (TCD/SEM.80/1, p. 275); Prehoffer, *loc. cit.*, pp. 48–49.

[479] Signed by EEC, France, the Federal Republic of Germany, Luxembourg, the Netherlands and Switzerland at Bonn, 3 December 1976 (*International Legal Materials*, vol. XVI, No. 2, 1977, p. 242 (to be issued as No. 17511 in the United Nations *Treaty Series*).

[480] *Ibid.*, pp. 253–254. The seven families and groups of substances there listed were chosen primarily on the basis of their toxicity, persistence and, with exceptions, bioaccumulation. These include, in brief, organohologenic compounds and substances that can give rise to such compounds in a water environment, organophosphoric compounds, organostannic compounds, substances proven to be carcinogenic, mercury and mercury compounds, cadmium and cadmium compounds, and persistent mineral oils and petroleum phrycocarbons. Cf. the recommendations under the heading "Identification

(*Continued on next page.*)

stances is nonetheless to be eliminated gradually, "taking into account the results of studies made by experts concerning each one, as well as the technical means available".[481] With respect to a second group, pollution is merely to be reduced;[482] the list is shown in annex II of the Convention.[483] The necessity for drawing up such specific lists seems now fully accepted. Other provisions of the Convention provide for national inventories of discharges, to be reported to the International Commission for the Protection of the Rhine against Pollution.[484] Each Government assumes responsibility for the installation and operation of measuring instruments and systems to determine the concentration of the substances listed in the cited annexes.[485] When one of the Governments notes a sudden and sizeable increase in any of the substances listed in the annexes, or has knowledge of an accident that may seriously endanger the quality of the waters, it will inform the International Commission and the parties likely to be affected "without delay".[486] "Any discharge into the surface waters of the Rhine basin that may contain one of the annex I substances" is subject to prior authorization;[487] concentration limits and time limits are to be set, on the proposal of the International Commission.[488] Finally, the parties "will endeavour to establish within two years" from the Convention's entry into force their "national programmes for reducing the pollution" by substances listed in annex II; any discharge of such substances is to be limited "severely".[489]

281. In recent years, the topics of water pollution and pollution in general have spawned a vast, specialized literature, both technical and legal, a literature that embraces inter-State relations.[490] Most of the scholars

(*Footnote 480 continued*)

and control of pollutants of broad international significance' in the Action Plan for the Human Environment, especially recommendations 71–73, 75–77, 81 and 83; also recommendations 51–53 on machinery for international co-operation (*Report of the United Nations Conference on the Human Environment* . . ., pp. 20–21 and 17–18).

[481] Art 1, para. 1 *a* (*International Legal Materials*, vol. XVI, No. 2, 1977, p. 243).

[482] Art. 1, para. 1 *b* (*ibid.*).

[483] *Ibid.*, pp. 254–255. These include, in brief, parts of families and groups of substances for which the concentration limits (referred to in art. 5 of the Convention) have not been established, plus some families and groups of substances that have a detrimental effect on the water medium, but can be limited to a certain area. Included are certain metalloids and metals (as well as their compounds), biocides and their derivatives (excluding those listed in annex I), substances having a detrimental effect on the taste or smell or giving rise to such substances in water, toxic or persistent organosilicon compounds (with exceptions), inorganic phosphorus, non-persistent mineral oils and petroleum hydrocarbons, cyanides, fluorides, ammonia and nitrites.

[484] Art. 2, paras. 1 and 2 (*ibid.*, p. 244). The International Commission was created by an Agreement of 29 April 1963; in 1976, EEC became a member of the Commission.

[485] Art. 10, para. 1 (*ibid.*, p. 248). Each Government is to report its results regularly to the International Commission; in turn, the Commission is to prepare an annual report making it possible to follow changes in the quality of the Rhine waters (art. 10, paras. 2 and 3).

[486] Art. 11 (*ibid.*, p. 249).

[487] Art. 3, para. 1 (*ibid.*, p. 244).

[488] Art. 3, paras. 2–4, and art. 5, paras. 1–3 (*ibid.*, pp. 244–246).

[489] Art. 6, paras. 2 and 1 (*ibid.*, p. 247). On the same date, 3 December 1976, the same Governments (but not EEC) concluded a Convention on the protection of the Rhine against pollution by chlorides (*ibid.*, p. 265). One of the objectives is to reduce the discharge of chloride ions into the Rhine by at least 60 kg on an annual average, to be achieved gradually and on French territory (art. 2, para. 1). Measures are to be taken by all the parties to prevent an increase in the discharge of chloride ions (art. 3); the Commission is to have proposed "means to achieve progressively a new chloride-ion concentration limitation over the entire course of the Rhine" within four years of the entry into force of the Convention (art. 6). A number of other provisions are similar to those of the convention on chemical pollution. See also Council Directive of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances (80/68/EEC). (*Official Journal of the European Communities* (Luxembourg), vol. 23, No. L 20, 26 Jan. 1980, p. 43).

[490] See *inter alia* Bourne, "International law and pollution of international rivers and lakes", *loc. cit.*, p. 115, and works there cited; P-M Dupuy, *La responsabilité internationale des Etats pour les dommages d'origine technologique et industrielle* (Paris, Pedone, 1977), and works there cited; Lester, "Pollution", *loc. cit.*, p. 88, and works there cited; Utton, "International water quality law", *International Environmental Law* (*op. cit.*), p. 154, and works there cited; G. Gaja, "River pollution in international law" (The Hague Academy of International Law, *Colloquium 1973—The Protection of the Environment and International Law*, A.-Ch. Kiss, ed. (Leyden, Sijthoff, 1975), p. 353; H. Brownell and S. D. Eaton, "The Colorado River salinity problem with Mexico", *American Journal of International Law*, vol. 69, 1975, p. 255; A. Gonzales de León, "The Mexican position: national and international considerations", *Natural Resources Journal*, vol. 15, 1975, p. 109; "Proceedings of the Conference on International and Interstate Regulation of Water Pollution", 12–13 March 1970, *Columbia Journal of Transnational Law*, C. K. H. O'Malley, ed. (New York, 1970); WHO, *Water Pollution Control in Developing Countries*, Technical Report Series No. 404 (Geneva, 1968), and *Aspects of Water Pollution Control* (*op. cit.*), with contributions by W. Christ, H. Fischerhof, C. W. Klassen, E. J. Manner, G. McNaughton, T. Nagibina and M. Petrik; G. Handl, "Territorial sovereignty and the problem of transnational pollution", *American Journal of International Law*, vol. 69, 1975, p. 50; "Balancing of interests and international liability for the pollution of international watercourses: customary principles of law revisited", *The Canadian Yearbook of International Law, 1975* (Vancouver), vol. XIII, p. 156; and "The principle of 'equitable use' as applied to internationally shared natural resources: its role in resolving potential international disputes over transboundary pollution", *Belgian Review of International Law* (Brussels), vol. XIV, 1978–1979–1, p. 40; J. L. Serwar, "International co-operation for pollution control", *Law, Institutions and the Global Environment*, L. Hargrove, ed. (Dobbs Ferry, N.Y., Oceana Publications, 1972), p. 178; W. Ferguson, "Note on international trade implications of pollution control", *Cornell Law Review* (Ithaca, N.Y.), vol. 58, 1973, p. 368; Dupuy, "International liability of States for damage . . .", *loc. cit.*; S. Rubin, "Pollution by analogy: the Trail Smelter arbitration", *Oregon Law Review* (Corvallis, Oreg.), vol. 50, 1971, p. 259; J. E. Read, "The Trail Smelter dispute", *The Canadian Yearbook of International Law 1963* (Vancouver) vol. I, p. 213; Ianni, *loc. cit.*; V. Koutikov. "Quelques aspects de l'évolution récente du droit international en Europe" *Conférence sur le droit international* (Lagonissi, Greece, 3–8 April 1966), *Rapports et travaux, I: Les cours d'eaux internationaux* (Geneva, 1967), p. 97; R. E. Stein, "Legal and institutional aspects of transfrontier pollution control" (OECD, *Problems in Transfrontier Pollution* (Paris, 1974), p. 285); A. Scott and C. B. Bramsen, "Draft guiding principles concerning transfrontier pollution" (*ibid.*, p. 299); B. Pacteau, "Les problèmes juridiques internationaux de la pollution", *Les aspects juridiques de l'environnement: actes du colloque de la Section belge de l'Institut international de droit d'expression français* (Namur, 25–26 Oct. 1974) (Namur, Presses universitaires, 1975), p. 144; Ballenegger, *op. cit.*; J.-P. Dobbert, "Water pollution and international river law", *Yearbook of the Association of Attenders and Alumni of The Hague Academy of International Law, 1965* (The Hague), vol. 35, 1965, p. 60; H. L. Dickstein, "International lake and river pollution control: questions of method", *Columbia Journal of Transnational Law*, vol. 12, 1973, p. 487; P. Stainov, "Les aspects juridiques de la lutte internationale contre la pollution du Danube", *Revue générale de droit international public* (Paris), 3rd series, vol. XXXIX, No. 1, 1968, p. 97; J. J. Baskin, "Questions de droit international relatives à la pollution des eaux", *ibid.*, 3rd series, vol. XL. No. 2, 1969, p. 421; R. Bystricky, "La pollution des eaux de surface du point de vue international", *Revue de droit contemporain* (Brussels), 13th year, No. 2, 1966, at p. 76; M. Wolfrom, "La pollution des eaux du Rhin", *Annuaire français de droit international, 1964* (Paris), vol. X, at p. 754; A.-Ch. Kiss and C. Lambrechts, "La lutte contre la pollution de l'eau en Europe occidentale", *ibid., 1969*, vol. XV, p. 718; H. R. Bijl, "La lutte contre la pollution de l'eau un cas de coordination d'action internationale, *ibid., 1967*, vol. XIII, p.

specializing in the subject, following the findings of scientific and technical experts, urge system-wide scope for the study of the problems of water quality and environmental protection, even if specific measures to deal with these problems are to be undertaken by the individual system States. For example, at the 1975 Seminar in Budapest on River Basin Development many of the studies presented and the conclusions reached emphasized the importance of a systems-wide approach. In this context, the work of I. Dégen of Hungary was summarized, in part, as follows:

In the modern era, virtually all aspects of the multilateral relationship between socio-economic development and the natural environment are closely related to water conditions. Therefore, river basin development designed to manage water resources on a basin-wide scale has become one of the decisive factors in the evolution of socio-economic advancement.

The growing economic and social need for river basin development has resulted in the replacement of former isolated projects of local significance by technically, economically superior water resources systems developed gradually and operated in co-ordination. Considering the large number of natural and economic factors affecting water resources systems, it is very difficult to determine the proper development option in which limited economic and natural resources can be developed to the greatest benefit. This task calls for the integrated approach . . . which is realized substantially by attempting to include the largest possible number of effects into the sphere of decisions related to the development objectives . . .

The exact identification and evaluation of development objectives and effects are fundamental prerequisites . . ., especially in international river basins. In order to evaluate the achievement, multi-objective decision theory should be applied, along with systems analysis, in which special emphasis should be placed on the social and environmental aspects . . .[491]

282. The panel of experts convoked by the United Nations in 1957 gave extended attention to the techniques for more effective use of water resources. The panel's report, *Integrated River Basin Development*, was in such demand that, after several reprintings, a second edition was brought out. In the preface to the second edition, the panel's chairman G. F. White, reported, *inter alia*:

The past decade has . . . seen a pronounced change in public concern for reducing the growing pollution of streams from the wastes of city, farm and factory. As pollution loads increase through rising population, new agricultural technologies and complexity of industrial processes, and as the standards of public health and of recreational and aesthetic uses of water are raised in industrial countries, the demands on water management schemes to take account of opportunities to eliminate, dilute or treat effluents become more exacting. These demands show themselves in enlarged attention to pollution abatement in basin development schemes, and in strengthened national programmes to cope with pollution problems.[492]

The conviction of the Panel with respect to a system-wide approach for planning purposes is manifested in many parts of the report, including this statement:

The need for integrated river basin development arises from the relationship between the availability of water and its possible uses in the various sectors of a drainage area. It is now widely recognized that individual water projects—whether single or multipurpose—cannot as a rule be undertaken with optimum benefit for the people affected before there is at least the broad outline of a plan for the entire drainage area.[493]

And with specific reference to "co-operative action in developing an international river basin", the Panel observed that such action "might be expected to present problems similar to those encountered in dealing with national rivers, on the premise that a river basin is a coherent topographic feature", but, though "this concept may be correct in principle, political considerations often make it difficult to apply".[494] The Panel drew special attention to the "inadequacy of relevant international law",[495] but did not qualify its position. The Panel recommended external help through the United Nations family of organizations "for gathering the information necessary to make a [factual] report on the *status quo*",[496] as a basis for policy planning discussions between the countries concerned.

The Panel felt strongly that such discussions ultimately required institutionalization by the creation of permanent joint commissions. In this regard, it was felt to be

. . . apparent that there is a wide range of matters which may be discussed and clarified by joint commissions. . . . It is only to be expected that some of the points will be controversial and will stimulate vigorous argument. But in a functioning commission such arguments will be conducted in an atmosphere of co-operation rather than dispute, with a view to arriving at the right answer in the light of integrated planning.[497]

580; J. G. Lammers, "International co-operation for the protection of the waters of the Rhine basin against pollution", *Netherlands Yearbook of International Law, 1974* (Leyden), vol. V, p. 59; Seidl-Hohenveldern, "La pollution transfrontière et la recommandation C(74)224 de l'OCDE", *Temis* (Saragossa), No. 33–36, 1973–1974, p. 273.

[491] Dégen, "Integrated development of river basins: overview and perspectives" (United Nations, *River Basin Development* .. ., vol. I, p. 3); see also the working papers cited in that study. The Seminar considered useful the establishment of "centres in the major or otherwise important international river basins to promote investigation, collection and management of basic data, to promote technical development (remote sensing, computer facilities, etc.) and to co-ordinate socio-economic planning activities of the basin countries . . ." (*ibid.*, p. 20, recommendation 5). See also ECE, *Long-term Planning of Water Management*, vol. I (United Nations publication, Sales No. E.76.II.E.27), especially the conclusions in paras. 24–63; United Nations, *Management of International Water Resources* . . ., especially pp. 9–10, 14–19 and 64–67, and works and examples there cited; A. B. Futa, "Volta River project, evolution of the integrated basin development approach" (United Nations, *River Basin Development* . . ., vol. II, p. 220); Colliard, *op cit.*, pp. 356 and 384–416; F. B. Lotspeich, "Watersheds as the basic ecosystem: this conceptual framework provides a basis for a natural classification system", *Water Resources Bulletin* (Minneapolis, Minn., vol. 16, No. 4, 1980, p. 581. Cf. G. Schramm, "Integrated river basin planning in a holistic universe", *Natural Resources Journal*, vol. 20, 1980, p. 787, and works and examples there cited.

[492] United Nations, *Integrated River Basin Development* . . ., p. x. See also L. A. Teclaff, *The River Basin in History and Law* (The Hague, Nijhoff, 1967).

[493] United Nations, *Integrated River Basin Development* . . ., p. 1.

[494] *Ibid.*, p. 33.

[495] *Ibid.*, pp. 34–35.

[496] *Ibid.*, p. 35. The Panel had in mind international watercourses lacking management machinery, especially those shared by developing countries. For a report on an environmental impact assessment study undertaken to ascertain the impact on water quality from water resources development and funded by the United States Agency for International Development, see M. S. Gould, "A water quality assessment of development in the Senegal River Basin", *Water Resources Bulletin*, vol. 17, No. 3, 1981, p. 466. See also C. Reizer, *Contribution à l'étude hydrobiologique du Bas-Sénégal* (Nogent-sur-Marne, Centre technique forestier tropical, 1971).

[497] United Nations, *Integrated River Basin Development* . . ., p. 37. Annex I of the report, "Organization of basic surveys", lists, under the heading "Progressive collection of additional data", physical data, including biological, chemical, pollution and public health data (*ibid.*, p. 48). Annex IV is devoted to "health implications of water-related parasitic diseases in water development schemes" (*ibid.*, pp. 60–64).

In any event:

> Having regard to the fact that any incentive to co-operation depends on the material and moral benefits derived from such co-operation, it is imperative that the benefits in quantitative and qualitative terms be clearly described as early as possible.[498]

Moreover,

> . . . it is clear that co-operation must be fostered and nurtured if any real progress . . . is to be made. The question arises as to what might be the sequence of steps and who is to initiate and promote them.[499]

283. Finally, in this connection, an experienced student of the problems associated with international watercourses concludes that:

> . . . some questions of water management, such as water-quality problems, and allocations of resources cannot be adequately solved on the basis of [bilateral] treaties [of limited territorial competency]. These questions necessitate the co-operation of all countries concerned, with a basin-wide territorial competency. The trend indicates an evolution towards this type of treaties.[500]

284. The Special Rapporteur believes it to be appropriate, in the light of the trend of State practice and expert opinion, to suggest an article respecting water quality that would foster active co-operation, even if it must fall short of prescribing "permanent joint commissions".[501] That proposed draft article is set forth after the following exposition of closely related environmental problems.

7. Shared water resources and the environment

285. With respect to the additional dimensions of the topic which reflect the now universal concern for the preservation and even improvement of the environment, less space may be devoted. Major elements of the concern, and of the material, have just been covered in the treatment of water pollution. Environmental protection, in so far as watercourse systems are concerned, involves, however, much more than the quality of water as such. At issue also are the effects, through water, on wildlife, including endangered species, on the flora of the area reached by waters, on the genetic resources and on the biotic potentials of the region. Even the viability and durability of machines, pipelines, instruments and port facilities are directly affected by the ambient conditions. None of these may be part of a "use" of the waters, properly so called. In many but not all cases, water use may give rise or contribute to the totality of conditions that produce damaging results.[502]

286. For some purposes "environment" is described, or defined, as the "assemblage of material factors and conditions surrounding the living organism and its component parts". Thus it includes "both external and internal factors. In the external environment inanimate objects and the forces associated with them constitute the physical environment, and the living things and their derivatives with which the animal may be associated constitute the organic environment."[503] In modern practice, aesthetics and vegetation and even bacterial populations are embraced.[504] Many industrial processes,[505] and perhaps more significantly "human habitats",[506] involve substantial control of the environment, while in the field of environmental protection, preserving or restoring the free state of nature is the fundamental focus, plus the special feature of improving the "quality of life" for man.[507]

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[498] *Ibid.*, p. 33.

[499] *Ibid.*, p. 35.

[500] Prehoffer, *loc. cit.*, vol. II, p. 49.

[501] It may be noted that the Assistant Administrator of UNDP and Regional Director for Africa, M. Doo Kingué, recalled at the 1981 Dakar Interregional Meeting "the compelling physical and economic reasons justifying the need for regional co-operation in the development, conservation and use of shared river and lake basins and the need to channel such co-operation through intergovernmental river organizations" (United Nations, *Experiences in the Development and Management . . .*, p. 4, para. 3).

[502] Pollutants in water may become airborne and result in air pollution. See P. Raunta, "Jäteveden käsittely ja ilman mikrobit" (Sewage treatment and airborne microbes), *Vesitalous* (Helsinki), vol. 21, 1980, p. 16. Conversely, certain air pollutants may precipitate as "acid rain", causing serious transfrontier water pollution, as in the case along the eastern United States-Canadian border and over large parts of Europe. See "Acid rains, a new problem for UNEP", *Uniterra* (Nairobi), vol. 4, No. 9, 1979, pp. 1, 3; F. H. Braekke, ed., *Impact of Acid Precipitation of Forest and Freshwater Ecosystems in Norway*, (Oslo, Norwegian Forest Research Institute, 1976); R. W. Shaw, "Acid precipitation in Atlantic Canada", *Environmental Science and Technology* (Washington, D.C.), vol. 13, No. 4, April 1979, p. 406; A. Holt-Jensen, "Acid rains in Scandinavia", *Ecologist* (Wadebridge, Cornwall), vol. 3, No. 9, 1973, p. 378; G. Hidy *et al.*, "International aspects of the long-range transport of air pollutants", report prepared for the United States Department of State, 1978; United States of America, Department of State and Council on Environment Quality, G. O. Barney, ed., *The Global 2000 Report to the President—Entering the Twenty-first Century*, vol. 2: *The Technical Report* (Washington, D.C., 1980), pp. 335–337. On genetic aspects, see Action Plan for the Human Environment, recommendations 39–45, and on fisheries, *ibid.*, recommendations 48–50 (*Report of the United Nations Conference on the Human Environment . . .*, pp. 13–17).

[503] *Van Nostrand's Scientific Encyclopedia*, 5th ed. (New York, Van Nostrand Reinhold, 1976). Biological oxygen demand, salinity and toxicity figure prominently in assessing the freshwater environments; ecologically significant "limiting factors" include temperature, clarity, concentrations of oxygen and various salts and evaporation rate. See *inter alia* R. E. Dickinson, *Regional Ecology: the Study of Man's Environment* (New York, Wiley, 1970); R. H. MacArthur, *Geographical Ecology* (New York, Harper and Row, 1972); B. J. Meggers, E. S. Ayensu and W. D. Duckworth, eds., *Tropical Forest Ecosystems in Africa and South America* (Washington, D. C., Smithsonian Institution Press, 1973); G. L. Clarke, *Elements of Ecology* (New York, Wiley, 1965); E. P. Odum, *Ecology* (New York, Holt, Rinehart and Winston, 1963).

[504] See the works cited above; also F. Graham, Jr., *Since Silent Spring* (Boston, Houghton Mifflin, 1970); H. W. Helfrich, Jr., ed., *Agenda for Survival* (New Haven, Conn., Yale University Press, 1970).

[505] See e.g. T. R. Camp, *Water and its Impurities* (New York, Reinhold, 1963); C. Furnham, ed., *Industrial Wastewater Control* (New York, 1965); E. W. Steel, *Water Supply and Sewerage*, 4th ed. (New York, McGraw Hill, 1960); H. F. Lund, ed., *Industrial Pollution Control Handbook* (New York, McGraw Hill, 1971). From the technical viewpoint, "pollution" is not restricted to detrimental change introduced by man, but includes "natural" pollution; the major categories for the hydro-environments are suspended solids, oils and greases, organic matter, dissolved metals, and toxic chemicals ("Water pollution", *Van Nostrand's Scientific Encyclopedia* (*op. cit.*)).

[506] Hospitals, museums, hothouses and laboratories are usual examples, but housing, offices, farms and conveyances of people and goods are also "controlled environments".

[507] *Report of the United Nations Conference on the Human Environment . . .*, p. 4, principle 8. See also the Declaration of the Council of the European Communities and of the representatives of the Governments of the member States meeting in the Council of 22 November 1973 on the programme of action of the European Communities on the environment (*Official Journal of the European Communities* (Luxembourg), vol. 16, No. C.112, 20 Dec. 1973), especially part I, title II, "Principles of a Community environment policy" (*ibid.*, p. 6); A. Pollis, ed., *Quality of Living: Environmental Viewpoints* (Oklahoma City, American Institute of Discussion, 1973); W. Rosenbaum, *The Politics of Environmental Concern* (New York, Praeger, 1973).

8. Health considerations

287. In this connection, water-related disease is now commonly regarded as an environmental control problem.[508] Not a few developing country system States have addressed this increasingly grievous problem in their system agreements or consultations. In Asunción, Paraguay, for example, the Foreign Ministers of the Plata Basin countries adopted a typical statement on the "importance of taking health problems into account in studies and plans for the development of the Basin":

Considering

That there are grave health problems arising from ecological relationships in the geographic area of the River Plate Basin, which have an unfavourable impact on the social and economic development of the region;

That this health syndrome is related to the quality and quantity of the water resources;

That close co-ordination and co-operation between the countries concerned in programmes for the control and eradication of these diseases is important;

That these problems are aggravated by the shortage of medical resources, particularly in the rural areas,

Decides

1. To emphasize the importance of taking health problems into account in plans and studies for the development of the Basin and to incorporate specific health activities in such plans and studies;

2. To recommend that when it is considering the health aspects of projects for the Basin, the Intergovernmental Committee on Co-ordination . . . should bear in mind the recommendations and decisions adopted by the Ministers of Health of the member countries at their periodic meetings . . .,

3. To transmit to the Intergovernmental Co-ordinating Committee CI/RC/IV Wording Paper No. 4.1 for its consideration and study in consultation with the Ministers of Health . . .[509]

288. The Treaty for Amazonian Co-operation of 1978 includes a special article in recognition of the matter's importance:

Article VIII

The contracting parties decide to promote co-ordination of the present health services in their respective Amazonian territories and to take other appropriate measures to improve the sanitary conditions in the region and perfect methods for preventing and combating epidemics.[510]

289. The Programme of Action of the European Communities on the environment devotes a chapter to "Objective evaluation of the risks to human health and to the environment from pollution". The passages of note include:

Pollution will be combated all the more effectively by the possession of objective knowledge of its effects. With this knowledge, it will be possible, . . . to set limits to the presence of pollutants in the environment and determine quality values for products in terms of standards designed to protect human health and the environment.

. . .

This requires standardization or harmonization of the methods and instruments used to monitor the various pollutants . . ., so as to render comparable the data obtained from measurements of these pollutants and of their effects.

This action may also reveal gaps in knowledge of pollutants and their effects, as well as indicate certain research subjects to be undertaken in the Community.[511]

The chapter goes on to list the tasks to be undertaken as quickly as possible and to set forth on a provisional basis a first and a second category of pollutants for priority investigation.[512] The action programme further declares:

Care should be taken to ensure that the quantity and quality of water resources available correspond to the various needs and requirements relating to health, ecology and economic activity.

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[508] See e.g. B. Diamant, "Environmental control of water-borne diseases", *Water International* (Lausanne), vol. 6, 1981, p. 50; WHO, *Health Hazards of the Human Environment* (Geneva, 1972), and "The functions of the engineer in the assessment and control of the environmental conditions and hazards that affect man's health" (document DIS/74.2) (mim.); UNEP, "Action plan on ecological and habitat management of schistosomiasis" (UNEP/GC(IV)/INF.1); *Proceedings of the International Conference on Water Pollution Control in Developing Countries* (Bangkok, 21–25 Feb. 1978) (Bangkok, Asian Institute of Technology, 1978), vol. I, p. 9. Malaria and intestinal diseases are the prime causes of infant mortality in developing countries; animal health is also seriously affected. See E. G. Wagner and J. N. Lanoix, *Excreta Disposal for Rural Areas and Small Communities* (WHO monograph No. 39) (Geneva, 1958); B. A. Weisbrod, *Disease and Economic Development: the Impact of Parasitic diseases in St. Lucia* (Madison, University of Wisconsin Press, 1973).

[509] Resolution No. 15, Act of Asunción, adopted by the Ministers for Foreign Affairs of the States of the River Plate Basin at their Fourth Meeting, in June 1971. (The text of the resolution is reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 323, document A/CN.4/274, para. 322.) See also the review of treaty obligations concerning protection of the aquatic environment ("Les obligations relatives à la protection du milieu aquatique") by J. J. A. Salmon (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, especially pp. 195–200 and 268–271).

[510] Text circulated to the General Assembly as document A/35/580, to be issued as No. 19194 in the United Nations *Treaty Series*. Among the environmental problems identified as common to Africa and Asia and in need of urgent attention by the Expert Group Meeting on the Environment of the Asian-African Legal Consultative Committee (New Delhi, 18–21 Dec. 1978) were waste disposal and treatment and public health service schemes.

"A wide variety of water developments can increase the incidence of water-related diseases. The creation of ponds, reservoirs and irrigation and drainage canals in the course of water resource development, and the widespread inadequacy of waste water disposal systems in LDC cities, all favour the persistence or spread of a number of such diseases. In recent years new irrigation systems and reservoirs in Middle and North Africa and West Asia have provided ideal habitats for the intermediate snail host of schistosomiasis, which has spread dramatically among rural populations. This debilitating disease of the intestinal and urinary tract now affects an estimated 250 million people throughout the world. . . . In some irrigation-project and reservoir areas, up to 80 per cent of the population is affected.

"In addition . . . there are numbers of other serious water-related diseases. These include malaria, filariasis (elephantiasis), and yellow fever, all of which are transmitted by mosquitoes. Onchocerciasis, 'river blindness' disease, is transmitted by flies. Paragonimiasis is a disease transmitted by a snail. Poorly managed water resource development projects, as well as the impact of urbanization on aquatic habitats and water quality, contribute to the spread of all these diseases. Diseases typical of waste water contaminated by human faeces—cholera, typhoid fever, amoebic infections and bacillary dysentery—can become problems anywhere in the world. In LDC countries today almost 1.5 billion persons are exposed to these diseases for lack of safe water supplies and human waste disposal facilities. Largely for this reason infant deaths resulting from diarrhoea continue at a high rate. Every day 35,000 infants and children under five years of age die throughout the world; most of these deaths occur in LDC countries. Schistosomiasis afflicts 200 million people in 70 countries and elephantiasis is estimated to cripple 250 million more" (*The Global 2000 Report . . . (op. cit.)*, p. 343).

[511] Part II of the Programme of Action, title I, chap. 1, sect. A ("Reasons") (*Official Journal of the European Communities* (Luxembourg), vol. 16, No. C 112, 20 Dec. 1973, p. 12).

[512] Chap. 1, sect. B ("Aims and content") (*ibid.*, pp. 12–13). Pollutants in the first category are listed under the headings "Air", "Noise pollution" and "Water"; those in the second category under the headings "Air" and "Water". Also: "Transport of pollutants over long distances and the harmful effects of their accumulation and their combination necessitate surveillance of the state of environmental pollution at the regional, national and international levels" (chap. 3, sect. 1, A) (*ibid.*, p. 15).

A single watercourse, especially if it flows through two or more countries, must simultaneously satisfy numerous different needs in neighbouring areas. Apart from technical measures to reduce consumption, to increase recycling, to combat pollution and to increase water supplies, strict planning is necessary to ensure supplies of this unique asset, which cannot be replaced by any other natural or artificial substance . . .[513]

9. Global scope of the problem

290. It is now realized that the problems of environmental protection are not limited to the highly industrialized regions of the world. In a report discussing, among other things, aquatic biota and water-related terrestrial biota, the Interim Committee for Co-ordination of Investigations of the Lower Mekong Basin, composed of the Lao People's Democratic Republic, Thailand and Viet Nam, points out:

Changes in the morpho-ecological nature of a river basin, brought about by the impact of development upon the physical and chemical characteristics of water, profoundly influence the biology of the water and its biota. The resultant biological environment, in turn, influences the physical and chemical factors which, in the first instance, have been responsible for remoulding it.[514]

291. During the consideration of the topic "Pollution of rivers and lakes and international law" by the Institute of International Law, one member laid particular emphasis on the importance of this problem area:

. . . It is agreed that water pollution, whether affecting inland waters or the high seas, has terrible effects on human, animal and plant health (cf. *Encyclopaedia universalis*, vol. 13, p. 256). For example, it is agreed that in industrial areas chemical water pollutants, including pesticides and herbicides, create great risks for the health of the population. At the head of the list of diseases which can be transmitted by polluted waters are typhoid fever, bacillary dysentery, infectious hepatitis and cholera (*loc. cit.* p. 257). The danger to health is particularly serious in that fish and shellfish can accumulate toxic substances in sufficiently high concentrations to affect human beings. This danger is far from hypothetical . . .

In the International Covenant on Economic, Social and Cultural Rights, adopted by the General Assembly on 16 December 1966 (resolution 2200 A (XXI)), the States parties recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health (art. 12, para. 1). Furthermore, among the steps to be taken by the States parties to the Covenant paragraph 2 (*b*) specifies, "the improvement of all aspects of environmental and industrial hygiene".[515]

292. Relevant international principles received major affirmation in the Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration).[516] Principle 2 emphasizes that the earth's natural resources, including water, "must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate". With relevance to watercourses, principle 6 becomes more specific:

The discharge of toxic substances or of other substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems . . .

Principle 8, among several other principles, entails affirmative improvement and control:

Economic and social development is essential for ensuring a favourable living and working environment for man and for creating conditions on earth that are necessary for the improvement of the quality of life.

Principle 14 declares:

Rational planning constitutes an essential tool for reconciling any conflict between the needs of development and the need to protect and improve the environment.

The two principles most often quoted by students of the law of international watercourses are the following:

Principle 21

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and 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.

Principle 22

States shall co-operate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction.[517]

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[513] Chap. 3, sect. 2, B (*ibid.*, pp. 16–17). "Accordingly, the methodology to be used for the definition of quality objectives for water should aim to reconcile all the requirements listed . . . and to ensure an equitable allocation of water, in the necessary quantities and appropriate qualities, among present and future users."

[514] "Role of environmental factors in internationally shared water resources", paper prepared by V. R. Pantulu, Mekong Secretariat, for the 1981 Dakar Interregional Meeting, p. 24 (mim.). See especially the discussion of disease vectors and parasites (*ibid.*, pp. 26–28), fish (*ibid.*, pp. 28–32), estuarine biota (*ibid.*, pp. 32–36), and wildlife (*ibid.*, pp. 38–39).

Schistosomiasis is a special problem in the Nile Valley. See UNESCO, *Environmental Effects of Arid Land Irrigation in Developing Countries*, prepared in co-operation with UNEP and SCOPE (Paris, 1978). See also Smithsonian Institution, *Snail Transmission of Schistosomiasis in the Lower Mekong Basin, with Observations on Other Waterborne Diseases*, report submitted to the Mekong Committee (Washington, D.C., 1974); "Fisheries and integrated Mekong River Basin development", report prepared for the Mekong Committee by the University of Michigan (Bangkok, 1976); Pantulu, "Environmental aspects of river development in tropical Asia, with particular reference to the Mekong Basin" (International Water Resources Association, *Proceedings of the Second World Congress on Water Resources*, New Delhi, 12–16 Dec. 1975 (New Delhi, 1975), vol. V, pp. 349); Hayton, "Progress in co-operative arrangements", sect. A (*a*) ("Pollution control and health management"), *loc. cit.*, pp. 70–71, and works and examples there cited.

[515] *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, pp. 379–380, observations of J. Zourek.

[516] *Report of the United Nations Conference on the Human Environment* . . ., pp. 4–6, chap. I, sect. II.

[517] Principles 21 and 22 are quoted here because of their relevance, although the aspect of responsibility for harm has been dealt with earlier (see sect. D above). Recommendation 51 of the Action Plan adopted at the United Nations Conference on the Human Environment provides that the "creation of river-basin commissions or other appropriate machinery for co-operation" for shared water resources be considered by the Governments concerned". It goes on to recommend that the following principles be considered:

"(i) Nations agree that when major water resource activities are contemplated that may have a significant environmental effect on another country, the other country should be notified well in advance of the activity envisaged;

"(ii) The basic objective of all water resource use and development activities from the environmental point of view is to ensure the best use of water and to avoid its pollution in each country;

"(iii) The net benefits of hydrologic regions common to more than one national jurisdiction are to be shared equitably by the nations affected;"

The recommendation then lists the undertakings that such "arrangements" will permit on a regional basis:

"(i) Collection, analysis and exchange of hydrologic data . . .;

"(ii) Joint data-collection programmes to serve planning needs;

The General Assembly subsequently amplified and affirmed these two principles, providing for the giving, in a co-operative spirit, of technical data on national works as a means of avoiding environmental harm and taking into account that principles 21 and 22 contained the basic norms on the subject.[518]

293. The United Nations Environment Programme, established on the basis of the report of the Stockholm Conference, itself formed an Intergovernmental Working Group of Experts on Natural Resources Shared by Two or More States. The final report of that Group, filed in 1978, contains a series of draft principles of conduct in the field of the environment for the guidance of States in the conservation and harmonious utilization of natural resources shared by two or more States.[519] Although not limited in their application to international watercourses, protection of the fresh water environment figured prominently in the discussions.

While set forth in the Special Rapporteur's second report, at least some of the text of these principles should not be omitted from this report.[520]

Principle 1

It is necessary for States to co-operate in the field of the environment concerning the conservation and harmonious utilization of natural resources shared by two or more States. Accordingly, it is necessary that . . . States co-operate with a view to controlling, preventing, reducing or eliminating adverse environmental effects which may result from the utilization of such resources . . .

Principle 2

In order to ensure effective international co-operation . . ., States sharing such natural resources should endeavour to conclude bilateral or multilateral agreements between or among themselves in order to secure specific regulation of their conduct . . . In entering into such agreements or arrangements, States should consider the establishment of institutional structures, such as joint international commissions, for consultations on environmental problems . . .

Principle 3

. . .

3. . . . it is necessary for each State to avoid to the maximum extent possible and to reduce to the minimum extent possible the adverse environmental effects beyond its jurisdiction of the utilization of a shared natural resource . . ., in particular when such utilization might:

(*a*) Cause damage to the environment which could have repercussions of the utilization of the resource by another sharing State;

(*b*) Threaten the conservation of a shared renewable resource;

(*c*) Endanger the health of the population of another State.

Without prejudice to the generality of the above principle, it should be interpreted taking into account, where appropriate, the practical capabilities of States sharing the natural resource.

Principle 4

States should make environmental assessments before engaging in any activity with respect to a shared natural resource which may create a risk of significantly affecting the environment of another State or States sharing that resource.

Principle 5

States sharing a natural resource should, to the extent practicable, exchange information and engage in consultations on a regular basis on its environmental aspects.

Principle 6

1. It is necessary for every State sharing a natural resource with one or more other States:

(*a*) To notify in advance the other State or States of the pertinent details of plans to initiate, or make a change in, the conservation or utilization of the resource which can reasonably be expected to affect significantly the environment in the territory of the other State or States; and

(*b*) Upon request of the other State or States, to enter into consultations concerning the above-mentioned plans; and

(*c*) To provide, upon request to that effect by the other State or States, specific additional pertinent information concerning such plans;

. . .

"(iii) Assessment of environmental effects of existing water uses;

"(iv) Joint study of the causes and symptoms of problems related to water resources, taking into account the technical, economic, and social considerations of water quality control;

"(v) Rational use, including a programme of quality control, of the water resource as an environmental asset;

"(vi) Provision for the judicial and administrative protection of water rights and claims;

"(vii) Prevention and settlement of disputes with reference to the management and conservation of water resources;

"(viii) Financial and technical co-operation of a shared resource . . ."

[518] General Assembly resolutions 2995 (XXVII) and 2996 (XXVII) of 15 December 1972. See also *Official Records of the General Assembly, Twenty-seventh Session, Annexes*, agenda item 47, document A/8901 (report of the Second Committee); J. Beesley, "The Canadian approach to international environmental law", *The Canadian Yearbook of International Law* (Vancouver), vol. XI, 1973, pp. 9–11; Sohn, *loc. cit.*; and the statement of the representative of Australia in the Second Committee to the effect that the Stockholm Declaration "represented the first comprehensive international political consensus on environmental issues and, although it was not legally binding, it had been the subject of intensive negotiations and should thus be generally acceptable" (*Official Records of the General Assembly, Twenty-seventh Session, Second Committee*, 1468th meeting, para. 27). It should be noted that the General Assembly, in its resolution 3129 (XXVIII) of 13 December 1973 on environmental co-operation with respect to shared natural resources, regarded efficacious co-operation between States necessary (by means of adequate international norms) and also considered that such co-operation should be based on prior information and consultation. For an examination of the arduous evolution of the prior consultation rule in connection with the Stockholm Conference and subsequently in the General Assembly, see Barberis, *Los recursos . . ., op. cit.*, pp. 157–164. The need for and acceptance of such obligations is not limited to the field of international watercourses: "Consultations, including a system of prior notification" are required in the Convention on the Law of the Sea "with a view to avoiding infringement of . . . rights and interests" of coastal States where activities with respect to resource deposits in "the Area" "lie across the limits of national jurisdiction" (art. 142, paras. 2 and 1) (*Official Records of the Third United Nations Conference on the Law of the Sea*, vol. XVII, document A/CONF.62/122).

[519] UNEP/IG.12/2, annexed to document UNEP/GC.6/17. See UNEP Governing Council decision 6/14 of 19 May 1978, "Co-operation in the field of the environment concerning natural resources shared by two or more States", expressing satisfaction with the work done by the Group of Experts, approving the report and authorizing the Executive Director to transmit the report to the General Assembly (*Official Records of the General Assembly, Thirty-third Session, Supplement No. 25* (A/33/25), pp. 154–155).

[520] The principles are accompanied by an "explanatory note" to the effect that the principles have been drawn up for the "guidance of States" with a view to the attainment of the desired objective "in a manner which does not adversely affect the environment", and to "encourage States sharing a natural resource, to co-operate in the field of environment". The Group had attempted to avoid "language which might create the impression of intending to refer to . . . either a specific legal obligation under international law, or to the absence of such obligation". Moreover, the "language used throughout does not seek to prejudice whether or to what extent the conduct envisaged in the principles is already prescribed by existing rules of general international law", nor was it intended "to express an opinion as to whether or to what extent and in what manner the principles—as far as they do not reflect already existing rules of general international law—should be incorporated in the body of general international law".

2. In cases where the transmission of certain information is prevented by national legislation or international conventions, the State or States withholding such information shall nevertheless, on the basis, in particular, of the principle of good faith in the spirit of good neighbourliness, co-operate with the other interested State or States with the aim of finding a satisfactory solution.

Principle 7

Exchange of information, notification, consultations and other forms of co-operation regarding shared natural resources are carried out on the basis of the principle of good faith and in the spirit of good neighbourliness and in such a way as to avoid any unreasonable delays either in the forms of co-operation or in carrying out development or conservation projects.

Principle 8

When it would be useful to clarify environmental problems relating to a shared natural resource, States should engage in joint scientific studies and assessments, with a view to facilitating the finding of appropriate and satisfactory solutions to such problems on the basis of agreed data.

. . .

Principle 13

It is necessary for States, when considering, under their domestic environmental policy, the permissibility of domestic activities, to take into account the potential adverse environmental effects arising out of the utilization of shared natural resources, without discrimination as to whether the effects would occur within their jurisdiction or outside it.

. . .

Principle 15

The present principles should be interpreted and applied in such a way as to enhance and not to affect adversely development and the interests of all countries, and in particular of the developing countries.

294. As the Special Rapporteur's second report described in detail, the Sixth Committee of the General Assembly proved willing to do not much more than to take note of these principles.[521] Nevertheless, elements of the report of the UNEP Intergovernmental Group which, it should be emphasized, are encountered in numerous other sources as well, have found their way into the proposed articles on the law of the non-navigational uses of international watercourses, among them the articles on water as a shared natural resource, responsibility for appreciable harm, and information and data sharing, as well as the article about to be proposed on pollution and environmental protection.

295. The United Nations Water Conference had earlier addressed itself to "codes of conduct" with respect to shared water resources. At the Conference, some representatives considered it "most important to define" such codes, which

could also be framed in such a manner as to allow proper evolution and should be flexible enough to govern the administration of shared water resources during the various stages of socio-economic as well as political development. The basic principles could include free exchange of information among co-riparian States and development of procedures for joint evaluation of factual information.[522]

[521] *Yearbook . . . 1980*, vol. II (Part One), pp. 185–188, document A/CN.4/332 and Add. 1, paras. 163–185.

[522] *Report of the United Nations Water Conference . . .*, p. 115, para. 114. Many of the pertinent recommendations and resolutions of the Conference have been taken up in more detail in previous sections of this report. See also Utton, "International environmental law and consultation mechanisms", *Columbia Journal of Transnational Law* (New York), vol. 12, 1973, p. 56.

10. Scientific studies on environmental questions

296. With respect to environmental protection, even as limited to applications involving international watercourses, a considerable body of professional literature has already appeared.[523] The United States Council on Environment Quality and the Department of State undertook in 1977 at presidential request a world-wide appraisal of each major factor making up the environment, followed by an assessment of environmental ramifications and projections to the year 2000.[524] Separate sections deal with climate, technology, food, fisheries, forestry, water, energy, etc., and the dependent relationships between and among these components are emphasized; major attention is paid to developing countries. With respect to the projections for fresh water quality problems, based on FAO projections, the *Global 2000 Report* takes up salinity, water-

[523] In addition to the many works cited in prior portions of this section devoted to water pollution, see especially Bilder, "The settlement of disputes in the field of international law of the environment", *Recueil des cours . . . 1975–I* (Leyden, Sijthoff, 1976), vol. 144, p. 139, and by the same author, "Controlling Great Lakes pollution: a study of United States-Canadian environmental co-operation", *Michigan Law Review* (Ann Arbor, Mich.), vol. 70, 1972, p. 469; Arnaud, *op. cit.*, and works and practice there cited; F. Florio, "Nota sull'inquinamento delle acque non marittime nel diritto internazionale", *Rivista di diritto internazionale* (Milan), vol. XLVI, 1963, p. 588; M. Despax, *La pollution des eaux et ses problèmes juridiques* (Paris, Librairies techniques, 1968); Bourne, "International law and pollution of international rivers and lakes", *University of Toronto Law Journal*, vol. 21, 1971, p. 193, and by the same author, "The avoidance and adjustment of international disputes concerning the environment: the waters of international drainage basins", paper prepared for the Conference on the Avoidance and Adjustment of Environmental Disputes (Bellagio, Italy, July 1974); J. Barros and D. Johnston, *The International Law of Pollution* (New York, Free Press, 1974); D. Livingston, "Science, technology and international law: present trends and future developments", *The Future of the International Legal Order* (*op. cit*), p. 104; Barberis, "La regla del intercambio de información o de consulta en el derecho internacional fluvial", *Primeras jornadas argentinas de derecho y administración ambientales* (Buenos Aires, Asociación para la protección del ambiente, 1974); S. Bleicher, "An overview of international environmental regulation", *Ecology Law Quarterly* (Berkeley, Calif.), vol. 2, No. 1, 1972, p. 1; L. A. Teclaff, "The impact of environmental concern on the development of international law", *Natural Resources Journal*, vol. 13, 1973, p. 357, and "Harmonizing water use and development with environmental protection", *ibid.*, vol. 16, 1976, p. 807; L. A. and E. Teclaff, "Transboundary ground water pollution: survey and trends in treaty law", *ibid.*, vol. 19, 1979, p. 629; P. Contini and P. Sand, "Methods to expedite environment protection: international ecostandards", *American Journal of International Law*, vol. 66, 1972, p. 37; P. Gieseke, "Verunreinigung von Binnengewässern als völkerrechtliches Problem", *Zeitschrift für Wasserrecht* (Cologne), vol. 3, 1965, p. 113; G. Guarneri, "Certains aspects juridiques internationaux d'un des problèmes de l'environnement: la lutte contre la pollution des eaux douces", *Rivista di diritto europeo* (Rome), vol. X, 1970, p. 285; F. Jordan, "Recent developments in international environmental pollution control", *McGill Law Journal* (Montreal), vol. 15, No. 2, 1969, p. 279; R. Vander Elst, "Le projet de convention européenne relative à la protection des eaux douces contre la pollution", *Belgian Review of International Law* (Brussels), vol. VI, 19701–1, p. 79; R. d'Arge and A. Kneese, "State liability for international environmental degradation: an economic perspective", *Natural Resources Journal*, vol. 20, 1980, p. 427; G. White, ed., *Environmental Effects of Complex River Development* (Boulder, Colo., Westview Press, 1977); G. Cano, *Derecho, política y administración ambientales* (Buenos Aires, Depalma, 1978); Centro Interamericano para el Desarrollo Integral de Aguas y Tierras, *Conclusiones del seminario interamericano sobre el manejo ambiental y el planeamiento del desarrollo de cuencas hidrologicas* (Merida, Venezuela, 1978); UNITAR, "Protecting the human environment: procedures and principles for preventing and resolving international controversies" (E.75.XV.PS/9).

[524] *The Global 2000 Report . . .* (*op. cit.*), especially pp. 431–499. For praise of the study by the Executive Director of UNEP, see *Uniterra* (Nairobi), vol. 5, No. 8, 1980, pp. 1 and 5–6.

logging (drainage) and disease transmission by streams, lakes and aquifers.[525] Selected summary statements from the report can serve to bring home the increasingly critical state of earth's water resources,[526] for example, the following:

Existing trends indicate that the problems of air and water pollution can be expected to worsen, and the spread of water-borne diseases .. . will present increasing threats to human health.[527]

Water problems resulting from deforestation have appeared in 16 countries in the form of critical water shortages, and in 10 countries in the form of increased flooding. Some countries shared both drought and flooding.[528]

Consequences of increased fertilizer use for aquatic systems are more serious than terrestrial effects and include eutrophication and nitrate contamination of drinking water supplies.[529]

The disruption of water systems is the most certain environmental consequence of forest elimination. Deforestation is most rapid in the very region where water systems are most vulnerable: the equatorial (tropical) belt, . . . The equatorial belt receives almost half the globe's total terrestrial rainfall . . . and the rain is substantially more erosive than elsewhere in the world . . . Deforestation of this belt will have serious effects on the flows in the major river systems such as the Mekong, the Ganges, the Amazon, the Congo, and their tribuaries; . . . Effects range from landslides in the mountains and siltation of reservoirs and irrigation areas to the smothering of marine life with silt in coastal areas.[530]

Just one example of the deforestation mentioned, the steady acceleration of which is fully documented, may be cited:

Should population pressures lead to large-scale removal of forest cover in Nepal and Assam, Bangladesh as a whole would be adversely affected by the increased runoff. Under present conditions the country is subject to periodic severe flooding, and the prospect of more frequent and damaging floods would threaten both the productivity of the land and large portions of the population. This may be the most significant environmental problem facing Bangladesh by the year 2000.[531]

Moreover,

even outside of Asia deforestation of watersheds will affect not only natural systems but also the downstream reservoirs, ports, cities, and transportation facilities, all of which will suffer from flooding, sedimentation, and decreased dry-season water levels.[532]

Other conditions are also increasingly causing environmental deterioration:

Burning, overgrazing, and cultivation practices that expose the soil for long periods . . . intensify the extremes of flooding and aridity by reducing soil porosity and water storage capacity, by reducing organic matter, and by increasing compaction.[533]

297. The environmental impacts of large river basin development schemes are often great. Large dams involve these impacts, for example:

The inundation of farmland, settlements, roads, railroads, forests, historic and archeological sites, and mineral deposits;

The creation of artificial lakes, which often become habitats for disease vectors such as the mosquitoes that transmit malaria and the snails which transmit schistosomiasis;

The alteration of river régimes downstream of dams, ending the biologically significant annual flood cycle, increasing water temperature, and sometimes triggering river bank erosion as a result of an increased sediment-carrying capacity of the water;

The interruption of upstream spawning migrations of fish; and

Water quality deterioration.[534]

Irrigation systems have their own environmental problems:

Danger of soil salinization and waterlogging in perenially irrigated areas;

Water weeds, mosquitoes, and snail infestation of drainage canals, with the danger of malarial and schistosomiasistic infections spreading . .., especially in parts of Africa and Latin America; and

Pollution of irrigation return water by a variety of agricultural chemicals, with negative consequences for aquatic life and for the human use of downstream waters.[535]

Thus

While the benefits of dams and irrigation development may outweigh the costs, environmental impacts have a definite bearing on the benefit/cost ratios . . .[536]

298. The projections in the report

point to world-wide increases in urbanization and industrial growth in the intensification of agriculture—trends that, in turn, imply large increases in water pollution in many areas . . .

Urban and industrial effluent will be concentrated in the rivers, bays, and coastal zones near the world's largest urban-industrial agglomerations. In the developing world—where 2 billion additional persons are projected to be living by 2000 and where rapid rates of urbanization continue—urban and industrial water pollution will become ever more serious because many developing economies will be unable or unwilling to afford the additional cost of water treatment.[537]

Urban and industrial growth also increases consumptive uses of water, one of the fastest growing of which is the consumptive use of evaporative cooling for thermal-electric generating facilities.

Thermal pollution impacts are numerous and generally deleterious in mid to low latitudes. . . . In the tropics, . . . where . . . many species live near their upper temperature tolerance, thermal discharges are often lethal. At all latitudes increased temperature reduces the dissolved oxygen in the water, stressing aquatic fauna by speeding metabolic rates while at the same time depleting oxygen supplies.[538]

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[525] *The Global 2000 Report . . .* (*op. cit.*), pp. 137 *et seq.*, especially pp. 150–152, 159, 242–243.

[526] Details, including examples involving international watercourses, may be found in the study.

[527] *Ibid.*, p. 244.

[528] *Ibid.*, p. 274. Also, as a result of improper farming and watershed practices, "hydrologic destabilization will increase rates of erosion and loss of soil organic matter through the year 2000" (*ibid.*, p. 280).

[529] *Ibid.*, p. 284.

[530] *Ibid.*, p. 320.

[531] *Ibid.*, p. 321.

[532] *Ibid.* "From the standpoint of both water supply and water quality, the condition of a catchment or river basin is determined largely by the flora on the upper portions of the basin. The high, often steep portions of the basin usually receive a large proportion of the rainfall, and the flora on these slopes are critically important in determining the quality and flows of water throughout the basin" (*ibid.*, p. 334).

[533] *Ibid.*, p. 335.

[534] *Ibid.*, p. 339.

[535] *Ibid.* In addition to malaria and schistosomiasis, there are numerous other serious water-related diseases.

[536] *Ibid.* p. 339.

"The situation in the Mekong River Basin happens to be relatively well understood because 20 years of internationally co-ordinated studies have examined the entire river basin as a single planning unit. Other densely populated river basins in Asia, Africa and Latin America are the focus of similarly ambitious schemes, but in most cases there are no co-ordinated studies or even adequate data. Consequently the full social and economic costs of these proposed projects can scarcely be estimated."

"A considerable list of costly impacts are associated with the High Aswan Dam and the irrigation development that has subsequently taken place in the Nile Delta."

[537] *Ibid.*, p. 340.

[538] *Ibid.*, p. 341. Other impacts include the destruction of small organisms such as fish larvae (often poisoned by antifouling

(*Continued on next page*)

299. According to the study, perhaps the most underrated aspect of freshwater systems throughout the world is their function as aquatic habitat.

> At some point, high social and economic costs will follow the continued neglect of the water quality needed to maintain ecosystem health. . . . since aquatic habitats are much more difficult to know and monitor than terrestrial ones, it is in serious doubt.[539]

300. Man's heightened exploration for and exploitation of mineral resources also have negative consequences for the freshwater environment: "The wastes from mining and the early stages of refining are . . . sometimes toxic . . ."; in this connection, "the mining and cleaning of coal produces more waste than the extraction of any nonfuel mineral. . . . Uranium is also responsible for large amounts of mining waste . . . several countries are now seeking ways to protect agricultural land, forests and waterways from pollution from mine wastes.[540]

301. If the forecasts arrived at in the *Global 2000* study are actually allowed to befall mankind, the prospects for improving, or even retaining, the quality of life on earth are problematical. Both intensified national efforts and vigorous multilateral co-operation are prerequisites to forestalling this multifaceted pattern of environmental degradation.[541]

(*Footnote 538 continued*)

biocides); reduction of fish abundance, biomass and species diversity; exacerbation of synergistic stresses; shifting of the balance among algae species, creating odour and taste problems; death of many sensitive species from sudden temperature changes during startups and shutdowns.

[539] *Ibid.*, p. 345. In addition to toxic wastes from petrochemical, metallurgical and other industries, the projected quadruplication in pesticide use on crops in developing countries will lead to increased poisonings (*ibid.*, pp. 397, 426).

[540] *Ibid.*, p. 385. "Surface and underground water is frequently polluted by effluents of mining and milling operations and by rainfall or stream action on solid mine and mill wastes" (*ibid.*, p. 387). Examples include acid mine drainage from sulphur-bearing mineral mines and dumps, killing many forms of life by lowering the pH, and salt wastes from potash mining; besides the famous case of the Rhine, the problem is acute in the Werra River waters shared by the German Democratic Republic and the Federal Republic of Germany, part of the Weser River system, with the result that Bremen can now take from the Weser only 20 per cent of its water supply (*ibid.*, pp. 387–388). Nuclear seepage underground has also become a threat to be reckoned with; see *Newsweek*, 20 Aug. 1973, pp. 79–80, and generally, Ford Foundation Nuclear Study Group, *Nuclear Power Issues and Choices* (Cambridge, Mass., 1977); L. Emmelin and B. Wiman, *The Environmental Problems of Energy Production* (Stockholm, 1978).

[541] See *The Global 2000 Report . . .* (*op. cit.*), pp. 406–409 and 427–431. "Water management could become the single most important constraint on increasing [crop] yields in the developing world" (*ibid.*, p. 100). On these matters, consult also, *inter alia*, R. Dasmann *et al.*, *Ecological Principles for Economic Development* (London, Wiley, 1974); H. E. Dregne, ed., *Arid Lands in Transition* (Washington, D.C., American Society for the Advancement of Science, 1970); FAO *The State of Food and Agriculture* (Rome, 1977), and *Guidelines for Watershed Management* (Rome, 1977); United States Agency for International Development. *Proceedings of the U.S. Strategy Conference on Tropical Deforestation* (Washington, D.C., 1978); E. P. Eckholm, *Losing Ground: Environmental Stress and World Food Prospects* (New York, Norton, 1976); J. Simpson and R. Bradley, "The Environmental impact of water reclamation in overseas countries", *Water Pollution Control* (Maidstone, Kent), vol. 77, part 2, 1978, p. 222; "Community water supply and wastewater disposal", *WHO Chronicle* (Geneva), vol. 30, No. 8, 1976, p. 329; UNESCO, *Tropical Forest Ecosystems*, a "state of knowledge" report prepared in collaboration with UNEP and FAO (Paris, 1978); OECD, *Anticipating the Effects from Chemicals in the Environment* (Paris, 1978), and *Interfutures* (Paris, 1979); P. Ehrlich *et al.*, *Ecoscience: Population, Resources, Environment* (San Francisco, Calif., Freeman, 1977); N. Myers, *The Sinking Ark* (Oxford, Pergamon Press, 1979); E. Salati *et al.*, "Origem e distribucão das chuvas na Amazônia, *Interciencia* (Caracas), vol. 3, No. 4, 1978, p. 200; Brazil, Secretarias de Estado de Planejamento e Coordenação, de Agricultura et de Ciencia e Tecnologia, *Planoroeste II* (Belo Horizonte, 1978); M. I. L'vovich, *Mirovye vodnye resursy i ikh budushchee* (Global water resources and their future) (Moscow, Mysl, 1974); R. Persson, *Forest Resources of Africa* (Stockholm, Royal College of Forestry, 1977); H. Anderson *et al.*, *Forests and Water* (Washington, D.C., U.S. Forest Service, 1976); Committee for Co-ordination of Investigations of the Lower Mekong Basin, *Pa Mong Optimization and Downstream Effects Study: Environmental Effects* (Bangkok, 1976); L. Obeng, "Water and health", *Clean Water for All* (Washington, D.C., 1976); International Union for Conservation of Nature and Natural Resources, *World Conservation Strategy* (Morges, Switzerland, 1978).

11. The special issue of the maritime interface

302. The technical and scientific communities study the interactions that take place where fresh water meets the sea, but water resources lawyers and international lawyers have not adequately stressed the importance of this dimension of the law of international watercourses.[542] Developments with respect to the marine environment demand attention. The concern for river groundwater system quality has, to be sure, long included saltwater intrusion—an environmental impact of the oceans upon the fresh water system—but serious attention must also be paid to the outpourings from streams and from aquifers into the sea, where the environmental impact has been serious. Much of the detrimental alteration is caused by watercourses, including international watercourses.

303. The problem is concentrated at the deltas and in the estuaries, but in addition effects are usually transmitted along the coasts and sometimes far out to sea.[543] Treaties have been concluded by the littoral States of several seas that include provisions relating to river-borne pollution.[544] Thus far, although these relationships are obviously of increasing importance, it seems that co-operation between marine resources managers and their opposite numbers dealing with international watercourses is rare. The 1980 Protocol for the protection of the Mediterranean Sea against pollution from land-based sources nonetheless provides especially for the international watercourse situation:

[542] But see S. Burchi, "International legal aspects of pollution of the sea from rivers", *The Italian Yearbook of International Law, 1977* (Naples), vol. III, 1978, p. 115; Hayton, "Progress in co-operative arrangements", *loc. cit.*, p. 73; Manner, "Water pollution in international law", *loc. cit.*, p. 70.

[543] The physical and biological relationships are complex. See e.g. "River discharge and marine pollution" (E/C.7/2/Add.8/Rev.1); O. Schachter and D. Serwer, "Marine pollution problems and remedies", *American Journal of International Law*, vol. 65, 1971, p. 84; J. L. Hargrove, *Who Protects the Ocean?* (St. Paul, Minn., West Publishing Co., 1975).

[544] Convention on the prevention of marine pollution from land-based sources (Paris, 1974) (*International Legal Materials*, vol. XIII, No. 2, March 1974, p. 352); Convention on the protection of the marine environment of the Baltic Sea area (Helsinki, 1974) (*ibid.*, vol. XIII, No. 3, 1974, p. 546); Convention on the protection of the Mediterranean Sea against pollution (Barcelona, 1976) (*ibid.*, vol. XV, No. 2, 1976, p. 290, to be issued as No. 16908 in the United Nations *Treaty Series*); Kuwait Regional Convention for co-operation in the protection of the marine environment from pollution, 1978, (*ibid.*, vol. XVII, No. 3, 1978, p. 511, see also pp. 501–511). On 23 March 1981, at a Conference of Plenipotentiaries of the States concerned (Abidjan, 16–23 March 1981), a Convention on co-operation in the protection and development of the marine and coastal environment of the West and Central African region was adopted, together with a Protocol on co-operation in combating pollution in cases of emergency, dealing with the question of wastes carried to the coasts by rivers (see Final Act of the Conference (UNEP/IG.22/7)).

Article 11

1. If discharges from a watercourse which flows through the territories of two or more parties or forms a boundary between them are likely to cause pollution of the marine environment of the Protocol area, the parties in question . . . are called upon to co-operate with a view to ensuring [the Protocol's] full application.

2. A party shall not be responsible for any pollution originating on the territory of a non-contracting State. However, the said party shall endeavour to co-operate with the said State so as to make possible full application of the Protocol.[545]

Within the international watercourse system, however, and aside from contractual duties, a collective obligation of the system States may be said to prevail for working out measures on an equitable basis to reduce or eliminate pollution causing appreciable harm to the marine environment, at least where the pollution originates in more than one system State.

304. Most significant is the United Nations Convention on the Law of the Sea, which consistently recognizes the problem, particularly in part XII, section 5, "International rules and national legislation to prevent, reduce and control pollution of the marine environment". The Convention has 14 articles directly bearing on the responsibilities of States with respect to international watercourses.[546] For example, article 207, "Pollution from land-based sources", stipulates in paragraph 1:

States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers [and] estuaries . . ., taking into account internationally agreed rules, standards and recommended practices and procedures.

Also relevant is the provision in paragraph 3 of article 7: "States shall endeavour to harmonize their policies in this connection at the appropriate regional level"; paragraph 4 obliges States to endeavour to establish regional rules, standards and recommended practices and procedures, as well as global ones, "acting especially through competent international organizations or diplomatic conferences"; paragraph 5 requires the said laws, regulations, measures, rules, standards and recommended practices and procedures to include "those designed to minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment".[547]

305. It would be difficult to maintain that domestic legislation and machinery for regulation, investigation, determination of fault and damage assessment would be sufficient where the source of the pollution is an international watercourse. Article 235 of the Convention, "Responsibility and liability", emphasizes compensation in respect of "all damage caused by pollution of the marine environment" and requires States to co-operate in "implementation of existing international law and the further development of international law relating to responsibility and liability for the assessment of and compensation for damage and the settlement of related disputes" (para. 3). Under these terms, the system States of an international watercourse that flows to the sea will be called upon to prepare standards and procedures to meet this obligation.

306. In section 4, "Monitoring and environmental assessment", the Convention provides:

States shall, consistent with the rights of other States, endeavour . . . directly, or through the competent international organizations, to observe, measure, evaluate and analyse . . . the risks or effects of pollution of the marine environment. (Art. 204, para. 1.)[548]

When States have "reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment, they shall . . . assess the potential effects of such activities . . . and shall communicate reports of the results" (art. 206). Reports must be published or provided "to the competent international organizations" (art. 205). Also mandated is co-operation "for the purpose of promoting studies, undertaking programmes of scientific research and encouraging the exchange of information and data acquired about pollution of the marine environment" (art. 200).[549]

307. "When a State becomes aware of cases in which the marine environment is in imminent danger of being

[545] *International Legal Materials*, vol. XX, No. 4, 1980, p. 873. "In conformity with article 11 . . ., the parties shall co-operate . . . in scientific and technological fields related to pollution from land-based sources, particularly research on inputs, pathways and effects of pollutants and on the development of new methods for their treatment, reduction or elimination. To this end the parties shall, in particular, endeavour to: (*a*) exchange scientific and technical information; (*b*) co-ordinate their research programmes" (art. 9) (*ibid.*, p. 872).

The Protocol applies "to polluting discharges . .. from land-based sources within the territories of the parties, in particular: . . . indirectly, through rivers, canals or other watercourses, including underground watercourses, or through run-off; . . ." (art. 4, para. 1 (*a*)) (*ibid.*, p. 870); "the danger posed to the marine environment and to human health by pollution from land-based sources and the serious problems resulting therefrom in many coastal waters and river estuaries" are recognized as "primarily due to the release of untreated, insufficiently treated or inadequately disposed domestic or industrial discharges, . . ." (*ibid.*, preamble, p. 869); the parties are to carry out "at the earliest possible date monitoring activities in order: (*a*) systematically to assess . . . the levels of pollution along their coasts, in particular with regard to the substances or sources listed in annexes I and II, and periodically to provide information in this respect; . . ." (art. 8) (*ibid.*, p. 872); ". . . when land-based pollution originating from the territory of one party is likely to prejudice directly the interests of one or more of the other parties, the parties concerned shall, at the request of one or more of them, undertake to enter into consultation with a view to seeking a saitsfactory solution" (art. 12, para. 1) (*ibid.*, p. 873).

See also annex I (*ibid.*, pp. 875–876), annex II (*ibid.*, pp. 876–877), and annex III (factors to be taken into account in issuance of authorizations for discharge of wastes containing controlled substances) (*ibid.*, pp. 877–878). Art. 8 of the 1976 Barcelona Convention requires the parties to take "all appropriate measures to prevent, abate and combat pollution of the Mediterranean Sea area caused by discharge from rivers . . ." (*ibid.*, vol. XV, No. 2, 1976, pp. 291–292).

[546] Arts. 66, 67, 194, 197–202, 204, 206, 207, 213 and 235 (*Official Records of the Third United Nations Conference on the Law of the Sea*, vol. XVII, document A/CONF. 62/122).

[547] These rules, standards, etc. are to be re-examined from time to time (art. 207, para. 4). The Convention also dedicates the first article in part XII, sect. 6, "Enforcement", to this point: with respect to land-based sources of pollution, States shall, among other things, take "measures necessary to implement applicable international rules and standards established through competent international organizations or diplomatic conferences . . ." (art. 213).

[548] "In particular, States shall keep under surveillance the effects of any activities which they permit or in which they engage to determine whether these activities are likely to pollute the marine environment" (art. 204, para. 2).

[549] Moreover, States "shall endeavour to participate actively in regional and global programmes to acquire knowledge for the assessment of the nature and extent of pollution, the exposure to it, and its pathways, risks and remedies".

damaged or has been damaged by pollution, it shall immediately notify other States it deems likely to be affected by such damage, as well as the competent international organizations" (art. 198). States in such an affected area "and the competent international organizations"—which might include river commissions or similar joint institutions created by system States—are required to co-operate "in eliminating the effects of pollution and preventing or minimizing the damage. To this end, States shall jointly develop and promote contingency plans for responding to pollution incidents . . ." (art. 199).

308. Assuming that the Convention enters into force, or that the foregoing provisions represent or otherwise become general international law, the question will arise whether and to what extent system States will need to join forces to meet these obligations as applied to their international watercourses, quite apart from the disposition and effect of the draft articles on the law of the non-navigational uses of international watercourses.

309. Article 193 of the Convention qualifies the right of States to exploit their natural resources, requiring its exercise to be "pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment". States are obliged, under article 194, paragraph 1, to "take all measures . . . that are necessary to prevent, reduce and control pollution of the marine environment from any source, . . . individually or jointly as appropriate, and they shall endeavour to harmonize their policies in this connection". Land-based sources are expressly listed in paragraph 3 of the article. In addition, paragraph 2 provides that States must "ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment . . .".

310. Finally, separate articles are devoted to interest in and responsibility for fisheries involving diadromous fish stocks and species. The use of international rivers by such fish in the completion of their life cycles engages the collective responsibility of system States.[550]

311. Although existing treaties and institutions calculated to deal with the protection of an international watercourse from pollution disregard what happens after the waters pass beyond the river mouth or delta,[551] system States presumably will become, where they have not already become, responsible for protecting the maritime waters reached by their rivers' effluents. The Convention on the Law of the Sea is considerable if not yet conclusive evidence of the growth and acceptance of such international obligations.[552] An international watercourse is, after all, part of a larger interdependent system.[553] The consequences of this interdependence require a broad approach to the rational management of international water resources; general rules of international law should foster the essential co-operation called for. Indeed, "equitable participation" for particular international watercourse systems may very well need to be recalculated in the light of maritime water quality and responsibilities for environmental protection. The considerable pollution and extra-watercourse environmental impact that may have been permitted previously by one or more system States may have to be abated because of obligations to protect and preserve the marine environment. For example, a decrease in coastal waters fish catches as a result of pollution introduced from an international watercourse may become the basis for complaint by an adjacent coastal State, or by a landlocked State with fishing rights, which State may or may not be a system State of the international watercourse.[554]

12. The proposed article

312. Based on existing and evolving State practice and the prevailing awareness of the fragility of the interdependent systems of the biosphere, as well as the noxious condition of so many of the world's international watercourses, the following draft article is proposed for the consideration of a successor Special Rapporteur and of the Commission:

Article 10. Environmental protection and pollution

1. For the purposes of this article, "pollution" means any introduction by man, directly or indirectly, of substances, species or energy into the waters of an international watercourse system which results in effects detrimental to human health or safety, to the use of the waters for any beneficial purpose, or to the conservation or protection of the environment.

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[550] Art. 66, "Anadromous stocks", and art. 67, "Catadromous species".

[551] With but apparently two known exceptions: the 1976 Convention on the protection of the Rhine against chemical pollution, which in art. 1, para. 2 (*g*) provides that the need "to preserve an acceptable quality of sea water" must be taken into account (*Official Journal of the European Communities* (Luxembourg), vol. 20, No. L 240 (19 September 1977), p. 38; to be issued as No. 17511 in the United Nations *Treaty Series*), and the 1971 Agreement between Finland and Sweden concerning frontier rivers, which is applicable to "the special effluents formed by the various branches at the mouth of the River Torne" and "the part of the Gulf of Bothnia lying between the Finnish and Swedish parishes of lower Torne" (art. 1) (United Nations, *Treaty Series*, vol. 825, p. 272). For their zones of common interest seaward from the River Plate, Argentina and Uruguay, under their 1973 Treaty, formed a Mixed Technical Commission (with headquarters in Montevideo), and created an entirely separate River Plate Administrative Commission (sited on Martín García Island) (*International Legal Materials*, vol. XIII, No. 2, 1974, pp. 261–262 and 265–266; see also *Yearbook . . . 1974*, vol. II (Part Two), pp. 298–300, document A/CN.4/274, paras. 115–130).

[552] To supplement the Helsinki Rules, the International Law Association adopted six articles on "Marine pollution of continental origin" (ILA, *Report of the Fifty-fifth Conference . . .*, pp. xviii–xviii and 97–106 (Rapporteur: K. Cuperus). See also "Resolution on measures concerning accidental pollution of the seas" of the Institute of International Law (*Annuaire de l'Institut de droit international, 1969*, vol. 53, Part Two, pp. 380–385).

In the course of the work of the Fifteenth Commission of the Institute on pollution of international rivers and lakes, the Rapporteur, J. J. A. Salmon, said that

> "it had become clear that pollution of the sea from sources on land was also transboundary pollution caused by rivers and lakes which it would be quite arbitrary not to deal with. Furthermore, the concern for protection of the environment as such—truly the heritage of mankind—which was now predominant throughout the world had even led the Commission to wonder whether States should not be required to see to the protection of the waters in their own territories" (*ibid.*, *1979*, vol. 58, Part Two, p. 107).

[553] See Burchi, *loc. cit.*, p. 131.

[554] See Convention on the Law of the Sea, part V in general, and in particular art. 56, paras.1 (*b*) (iii) and 2, and arts. 59, 60 and 69 (*Official Records of the Third United Nations Conference on the Law of the Sea*, vol. XVII, document A/Conf. 62/122).

2. For the purposes of this article, "environmental protection" means safeguarding the fauna, flora and other natural resources of the earth from destruction, impairment or degradation and the preservation of the quality of life and of its amenities.

3. Consistent with article 6 on "Equitable participation", article 7 on "Equitable use determinations" and article 8 on "Responsibility for appreciable harm" of these articles, a system State is under a duty to maintain pollution of shared water resources at levels sufficiently low that no appreciable harm is caused in the territory of any other system State, provided that a system State is under no duty to abate pollution emanating from another system State in order to avoid causing appreciable harm to a third system State as a result of such pollution, except in concert on an equitable basis with other system States.

4. At the request of a co-system State, a system State from whose territory pollution is emanating that causes harm, but not appreciable harm, in the territory of the co-system State by means of the waters of an international watercourse shall take all reasonable measures to abate the said pollution, provided that the co-system State defrays the reasonable costs, direct and indirect, of the appropriate abatement measures if so requested by the system State causing the harm.

5. At the request of any system State, the system States concerned shall consult with a view to preparing and approving lists of dangerous substances or species, the introduction of which into the waters of the international watercourse system shall be prohibited, limited, investigated or monitored, as appropriate.

6. Unless otherwise provided by agreement among the system States concerned, no State may pollute or permit the pollution of the waters of an international watercourse system in concentrations or combinations that result in loss of human life, or debilitating or disfiguring illness, in the territory of a co-system State. Without prejudice to its responsibility for appreciable harm under article 8 of these articles, in the event that such pollution none the less occurs, the polluting system State shall with all deliberate speed abate the pollution to the level necessary to avert the said result.

7. System States shall establish, individually or jointly, régimes to ensure that their activities and activities under their jurisdiction or control cause no appreciable or irreversible environmental degradation in or by means of the international watercourse system.

8. Where an international watercourse system discharges into maritime waters or an enclosed sea, the system States are under a duty individually and jointly and on an equitable basis to take the measures necessary to fulfil their obligations, customary and conventional, including those derived from the law of the sea, to protect the maritime environment, including preventive, corrective and control measures.

9. In the event of a pollution or environmental emergency, the system State or States within whose jurisdiction the emergency has been precipitated, the system State or States within whose jurisdiction the impact of the emergency occurs, and any system State or States having knowledge of the occurrence shall communicate by the most rapid means available to all system States that may possibly be affected all available relevant information and data and shall take immediate action to neutralize or mitigate the danger or the damage, individually or jointly with other system States.

10. The system States of an international watercourse system shall consult, either through their competent joint or international institutions or by recurrent meetings, with a view to the adoption of a pollution control and environmental protection régime for the system sufficient to meet their responsibilities in that regard under international law, including the present articles.

11. In the event that abatement or mitigation of specific pollution, or a particular programme for the protection of the environment, is required by one or more system States in order to achieve compliance with the provisions of this article, the system States concerned shall negotiate with a view to arriving at an agreed timetable and efficacious measures for the accomplishment of the abatement, mitigation or programme, or at alternative arrangements sufficient for the purpose, as appropriate.

12. In addition to the rights and duties described in article 8, on "Responsibility for appreciable harm", and article 9, on "Information and data sharing", of these articles, system States are under a duty to share with one another the available physical, chemical and biological data on pollutants and environmental protection factors, and the effects of pollution and environmental harm, related to their international watercourse systems, in order that individually and jointly the fullest practicable technical understanding of any pollution or environmental protection problem involving the international watercourse may be attained. Environmental impact assessments shall be prepared by the system States concerned, where one of them so requests and offers to defray the reasonable costs on an equitable basis.

13. In fulfilment of its obligations under this article, a system State may require contribution on a equitable basis from other system States benefited by the pollution control or environmental protection-related measures or programmes called for under the circumstances and, if the system State's resources are still insufficient, shall avail itself of available technical and other assistance from Governments and from intergovernmental organizations of which it is a member.

14. The provisions of this article are without prejudice to any duty owed by a system State or by the system States collectively to non-system States for harm caused to rights or interests of non-system States.

313. The proposed text begins with definitions of pollution and environmental protection, building on the several definitions found in the studies approved and published by non-governmental professional organizations and in State practice.[555] The definition in paragraph 1 of the suggested draft article excludes harmful changes in the quality or composition of the waters brought about by nature alone. That is, even though the agency may be indirect, human action or inaction is a prerequisite.[556] It should be noted that the

[555] All definitions will presumably be refined and collected in a separate article on definitions once the work of the Commission on this topic nears conclusion.

[556] Natural change, however, might very well result in environmental damage. As pointed out in the commentary to art. IX of the

(*Continued on next page.*)

definition is a "physical" one, not one defining pollution in terms of what is detrimental to the legally protected interests of States. The definition thus imports no notion or condition of legal injury. Pollution as here defined is, in brief, the fact of qualitative alteration directly or indirectly by human agency and adversely affecting, in the objective sense, water use, human health or safety, or the environment. Whether the consequences of such alteration require any degree of abatement as a matter of law is a separate question dealt with in other provisions of the article.[557]

314. Some of the leading prior definitions consulted provide useful comparison with the proposed text. The definition of the Institute of International Law is the one most recently adopted:

> . . . "pollution" means any physical, chemical or biological alteration in the composition or quality of waters which results directly or indirectly from human action and affects the legitimate uses of such waters, thereby causing injury.[558]

315. Still another definition is that of the Helsinki Rules:

> . . . the term "water pollution" refers to any detrimental change resulting from human conduct in the natural composition, content, or quality of the waters of an international drainage basin.[559]

As the commentary to this definition states, the concern "is not with changes that improve the content or quality of water"; it is with "changes that render the water either unusable or less usable for a beneficial use *or other changes that are of a deleterious nature*".*[560] Thus as early as the adoption of the Helsinki Rules (1966), the harmful effects of water pollution were seen as not restricted to impairment of a use of the waters. For example, water-borne or water-related disease may be contracted without going near the water, but the international watercourse system was the medium through which transmission was effected; creation of the conditions which facilitate the establishment of disease vectors is indirect human intervention. And, because

> the nature and effect of pollutants are in such a state of change, it is advisable to adopt a definition of pollution comprehending any detrimental alteration in the natural composition or quality of the water irrespective of its effects on subsequent users.[561]

316. The Secretary-General of the United Nations, in his report on "Prevention and control of marine pollution", used the following definition:

> Introduction by man, directly or indirectly, of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazard to human health, hindrance to marine activities including fishing, impairing of quality for use of seawater and reduction of amenities.[562]

(*Footnote 556 continued.*)

Helsinki Rules, defining pollution: "Of course, . . . 'human conduct' refers to failure to act as well as to affirmative action" (ILA, *Report of the Fifty-second Conference* . . ., p. 496). For example, failure to act to prevent the leaching of contaminants from mine tailings in the international watercourse would constitute "human conduct" in terms of the Helsinki Rules and introduction "indirectly" by man in terms of the definition here proposed.

[557] UNITAR, *International Co-operation for Pollution Control*, paper prepared by D. Serwer, Research Reports No. 9, Feb. 1972, p. 1.

A reading at this juncture of the classes of water pollution, as listed by WHO, may prove useful:

"(*a*) Pollution by bacteria, viruses and other organisms that can cause disease;

"(*b*) Pollution by decomposable organic matter, which by absorbing the oxygen in the water, kills fish, produces offensive smells and gives rise to general unsightliness; . . .

"(*c*) Pollution by inorganic salts, the characteristic of which is that they cannot be removed by any simple conventional treatment process; they may make the water quite unsuitable for drinking, for irrigation and for many industries;

"(*d*) Pollution by plant nutrients—potash, phosphates, nitrates, etc.—which are also largely inorganic salts but which have the added property of increasing weed growth, promoting algal 'blooms' and producing, by photosynthesis, organic matter that may settle on the bottom of a lake . . .;

"(*e*) Pollution by oily materials, which may be inimical to fish life, cause unsightliness, screen the river surface from the air thus reducing reoxygenation, accumulate in troublesome quantities . . . and have a high oxygen demand;

"(*f*) Pollution by specific toxic agents, ranging from metal salts to complex synthetic chemicals.

"Also worthy of mention are: waste heat, . . .; silt, . . .; and radioactive substances" (WHO, *Water Pollution Control* (Geneva, 1966), Technical Report Series No. 318, p. 6).

[558] Resolution on "the pollution of rivers and lakes and international law", art. I, para. 1 (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 197). The OECD definition, developed through extended consultation, reads:

"'Pollution' means any introduction by man, directly or indirectly, of substances or energy into the environment resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems, impair amenities or interfere with other legitimate uses of the environment", and

"'Transfrontier pollution' means any intentional or unintentional pollution whose physical origin is subject to and situated wholly or in part within the area under the national jurisdiction of one country and which has effects in the area under the national jurisdiction of another country" (OECD, *OECD and the Environment* (*op. cit.*), p. 116 (annex to recommendation C(77)28(Final), paras. (*a*) and (*c*)). The Intergovernmental Oceanographic Commission of UNESCO, in its "Comprehensive outline of the scope of the long-term and expanded programme of oceanic exploration and research", proposed the following definition of marine pollution:

"Introduction by man, directly or indirectly, of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazard to human health, hindrance to marine activities including fishing, impairing of quality for use of seawater and reduction of amenities" (A/7750, para. 2).

Art. 40 of the Statute for the Uruguay River, adopted by Uruguay and Argentina in 1975, defines "contaminación" as "la introducción directa o indirecta, por el hombre, en el medio acuático, de sustancias o energía de las que resulten efectos nocivos" (*Actos internacionales Uruguay-Argentina 1830–1980* (*op. cit.*), p. 601). See also the discussion of definitions of pollution in *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part One, pp. 268–272.

[559] Art. IX (ILA, *Report of the Fifty-second Conference* . . .), p. 494).

[560] *Ibid.*, p. 495.

[561] *Ibid.*, p. 496. "A river is considered polluted when the water in it is altered in composition or condition directly or indirectly as a result of the activities of man so that it is less suitable for any or all of the purposes for which it would be suitable in its natural state" (IAEA, *Disposal of Radioactive Wastes into Rivers, Lakes and Estuaries*, Report of a panel of experts sponsored by IAEA and WHO, Safety Series No. 36 (Vienna, 1971), p. 1, footnote 1). The Sub-Committee of the Asian-African Legal Consultative Committee appointed to prepare draft articles on the law of international rivers, proposed this definition: "Water pollution, as used in this proposition, refers to any detrimental change resulting from human conduct in the natural composition, content or quality of the waters of an international drainage basin" (proposition VIII, para. 2) (Asian-African Legal Consultative Committee, *Report of the Fourteenth Session* . . . (*op. cit.*), p. 105).

[562] E/5003, para. 2. Principle 7 of the Stockholm Declaration also includes "amenities":

"States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to

Reviewing that widely accepted definition, a UNITAR study observes:

Pollution is viewed as that part of the flow of materials and energy from man's activities to the environment that may cause undesirable effects. The choice of what is undesirable may vary with the physical, legal, economic, social and cultural context. Pollution control is viewed as the management of this flow in order to achieve objectives such as the protection of human health, the protection of organisms or populations other than man or the protection of other resources, including the stability of the environment itself.[563]

317. In the 1979 Convention on long-range transboundary air pollution, this definition appears:

(*a*) *"Air pollution"* means the introduction by man, directly or indirectly, of substances or energy into the air resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and material property and impair or interfere with amenities and other legitimate uses of the environment, and "air pollution" shall be construed accordingly;

(*b*) *"Long-range transboundary air pollution"* means air pollution whose physical origin is situated wholly or in part within the area under the national jurisdiction of one State and which has adverse effects in the area under the jurisdiction of another State at such a distance that it is not generally possible to distinguish the contribution of individual emission sources or groups of sources.[564]

Showing similarities, article 1, paragraph 4 of the Convention on the Law of the Sea carries the following definition:

"Pollution of the marine environment" means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.[565]

318. The 1969 draft European convention on the protection of fresh water against pollution adopted by the Consultative Assembly of the Council of Europe contains the definition:

... "water pollution" means any detrimental change directly or indirectly resulting from the activities of man in the natural composition, content or quality of the waters;[566]

the 1974 draft, however, extends the definition thus:

"Water pollution" means any impairment of the composition or state of water, resulting directly or indirectly from human agency, in particular to the detriment of:

Its use for human and animal consumption;

Its use in industry and agriculture;

The conservation of the natural environment, particularly of aquatic flora and fauna.[567]

In this connection it should be noted that the frequent and persistent problem of the intrusion of salt water into fresh water, surface and underground, is within the definition of pollution to the extent that human intervention has induced the salt water invasion, initially or to an increased degree or reach.

319. Since "substances" in the definition might not be interpreted to include plants, animals (for example, varieties of fish) and other living organisms including parasites, predators and vectors, "species" has been added to the definition. "Substances" may connote things inert, at least not alive. The introduction of various species can, for example, accelerate eutrophication, clog intakes and machinery, damage fisheries and aquacultures, reduce available oxygen, spoil recreation or transmit disease. The effects of such introduction can in some watercourses be as serious as, if not more so than, many contaminating substances (non-living) and be highly difficult to eradicate once introduced and established.[568]

320. Most countries have now adopted rather comprehensive anti-water pollution legislation for national application. The definitions found in these acts vary quite widely, but the basic sense is similar to what has evolved at the international level, though often more comprehensive or detailed. A French statute will serve to illustrate the point:

The provisions ... shall apply to direct and indirect discharge, drainage, disposal and deposit of waste matter of any kind, and more generally to anything liable to cause or increase a deterioration in the quality of waters, including surface waters, groundwaters, and maritime territorial waters, by changing their physical, chemical, biological or bacteriological characteristics.[569]

The corresponding definition in, for example, Romanian law reads:

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harm living resources and marine life, to damage amenties or to interfere with other legitimate uses of the sea" (*Report of the United Nations Conference on the Human Environment* . . ., p. 4).

[563] UNITAR, *International Co-operation for Pollution Control* . . ., p. 1.

[564] Art. 1 (E/ECE/1010).

[565] For similar language, see also the 1978 Kuwait Regional Convention for co-operation in the protection of the marine environment from pollution, art I, para. (*a*) (*International Legal Materials*, vol. XVII, No. 3, 1978, p. 512); the 1974 Convention on the protection of the marine environment of the Baltic Sea area, art. 2, para. 1 (*ibid.*, vol. XIII, No. 3, 1974, p. 547); the 1976 Barcelona Convention for the protection of the Mediterranean Sea against pollution, art. 2, para. (*a*) (*ibid.*, vol. XV, No. 2, 1976, p. 290, to be issued as No. 16908 in the United Nations *Treaty Series*).

[566] Art. 1, para. (*c*) (Council of Europe, Consultative Assembly, recommendation 555 (1969) (doc. 2561) of 12 May 1969, reproduced in *Yearbook* ... *1974*, vol. II (Part Two), p. 344, document A/CN.4/274, para. 374).

[567] Art. 1, para. (*d*), of the draft European convention for the protection of international watercourses against pollution (Council of Europe, Consultative Assembly, (doc. 3417, 4 April 1974, reproduced in *Yearbook* . . . *1974*, vol. II (Part Two), p. 346, document A/CN.4/274, para. 377).

". . . the waters below many LDC cities are often thick with sewage sludge and wastes from pulp and paper factories, tanneries, slaughterhouses, oil refineries, chemical plants, and other industries. One consequence of this pollution is declining fishing yields downstream from LDC cities";

"Moreover, declines have occurred around the world in freshwater systems, and in bays, lagoons, and estuaries. Frequently the changes . . . become apparent with the appearance of eutrophication, poisonous red tides, and the decline of inland fishing occupations." (*The Global 2000 Report* . . . (*op. cit.*), p. 340).

[568] "A less widely recognized problem is 'biological pollution', the introduction of non-native species into coastal ecosystems. Newly introduced species, freed of their natural predators, parasites, and competitors, can severely disrupt food webs, diversity, and stability and may effectively eliminate valuable native living marine resources" (*The Global 2000 Report* . . . (*op. cit.*), p. 302).

See also W. Courtenay, Jr. and C. Robins, "Exotic organisms: an unsolved complex problem", *BioScience* (Arlington, Va.), vol. 25, 1975, p. 306. Art. 196, para. 1, of the Covention of the Law of the Sea provides:

"States shall take all measures to prevent, reduce and control pollution of the marine environment resulting from . . . the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto" (*Official Records of the Third United Nations Conference on the Law of the Sea*, vol. XVII, document A/CONF. 62/122).

[569] Act No. 64-1245 of 16 Dec. 1964 on the administration and classification of waters and the control of water pollution, part I, "Control of water pollution and restoration of the purity of water", art. 1, last para. (France, *Journal officiel de la République française, lois et décrets* (Paris), 96th year, 18 Dec. 1964, No. 295, p. 11258, reproduced in *Yearbook* ... *1974*, vol. II (Part Two), p. 280, document A/CN.4/274, para. 30.)

The term "water pollution" shall be understood to mean alteration of the physical, chemical or biological properties of water, caused directly or indirectly by human activities, whereby the water becomes unfit for normal use for the purposes for which such use was possible before the alteration took place.[570]

321. The definitions of pollution often make reference to deleterious impact upon the environment, as does the one here proposed, but the larger scope of water-related environmental damage calls for a separate, if complementary, definition.[571] The concept of pollution is inherently qualitative. It deals not with flooding, impediments to fish migration, or water level changes *per se*. The environment, on the other hand, may be seriously damaged by these and many other non-"polluting" phenomena.

322. The amenities, mentioned in several previously cited definitions of pollution, are recognized in the proposed definition of "environmental protection" as worthy of safeguarding. Conservation, in the traditionally more limited sense of that term, is intended to be comprehended within "protection"—the larger, contemporary concept.[572] And the preservation of the quality of life, used in the Stockholm Declaration in the ample sense and emphasizing benefits to mankind,[573] is expressly included in so far as it may involve international watercourses. Improvement of the quality of life, an aim articulated especially with respect to developing countries, is not expressly provided for in this article, although all efforts in that direction naturally are allowable and commendable, consistently with the rules concerning protection of the environment that follow.[574]

323. Paragraph 3 of the proposed article ties the operation of the provisions concerning pollution to the previous articles on equitable participation, determination of the equitableness of uses and responsibility. The provisions on equitable participation (art. 6) correlate the right to use, on an equitable basis, with adequate protection and control of the components of the international watercourse system (paras. 1 and 3). The provisions guiding equitable use determinations (art. 7) make, as factors to be taken into account, *inter alia*, conservation of the water resources of the system, any interference by a use in the protection and control measures of other system States, the quality of alternative water supplies, pollution of the waters generally, and the willingness of system States to co-operate in protection and control measures (paras. 1 (*a*), (*b*), (*d*)). And the provisions on responsibility for appreciable harm (art. 8) condition the system State's right to use by proscribing appreciable harm (para. 1); however, that restriction is itself lifted where it is determined that the particular harm, even though appreciable, is permitted as part of the system State's equitable participation.

324. In the article here proposed on pollution and environmental protection, the aspects addressed in articles 6, 7 and 8 are not dealt with directly but are imported by reference ("consistent with" arts. 6, 7 and 8). The rule contained in paragraph 3 is not in the first instance couched negatively ("thou shalt not" cause appreciable harm to other system States) but states an affirmative duty to keep pollution below certain levels.[575] Moreover, a system State does not "inherit" the pollution abatement obligations of a co-system State vis-à-vis a third system State in which appreciable

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[570] Act of 20 April 1973 concerning water management, art. 43 (*Yearbook . . . 1974*, vol. II (Part Two) p. 288, para. 35).

[571] The predominant role of water even in overall environmental protection can readily be seen from the following definition in art. 1, first para., of the 1974 Convention between Denmark, Finland, Norway and Sweden on protection of the environment:

"For the purpose of this Convention, environmentally harmful activities shall mean discharge from the soil or from buildings or installations of solid or liquid waste, gas or any other substance into watercourses, lakes or the sea and the use of land, the seabed, buildings or installations in any other way which entails, or may entail environmental nuisance by water pollution or any other effect on water conditions, sand drift, air pollution, noise, vibration, changes in temperature, ionizing radiation, light, etc." (*International Legal Materials*, vol. XIII, No. 3, 1974, p. 591).

[572] The Stockholm Declaration lacks a definition of environmental degradation or damage; however, several of the principles are instructive:

"The natural resources of the earth including the air, water, land, flora and fauna and especially representative samples of natural ecosystems must be safeguarded . . ." (principle 2);

"Man has a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat . . ." (principle 4);

"The discharge of toxic substances or of other substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems . . ." (principle 6) (*Report of the United Nations Conference on the Human Environment . . .*, p. 4).

[573] "Economic and social development is essential for ensuring a favourable living and working environment for man and for creating conditions on earth that are necessary for the improvement of the quality of life" (principle 8). See also principles 11, 13 and 15. And see United States Agency for International Development, *Report on Environment and Natural Resource Management in Developing Countries* (Washington, D.C., 1979) vol. I.

[574] Special permissiveness in connection with safeguarding the fauna, flora and other natural resources of developing countries is not recommended. Technical and development assistance to developing countries with respect to environmental protection may indeed be called for in increased measure; however, departure from the equality of States may well produce a perverse result in this case. Opposing a double standard, see e.g. the observations of Messrs Oda, Ago, Suy, do Nascimento e Silva, Yasseen and Mosler on the draft resolution on pollution of rivers and lakes and international law considered at the Athens session of the Institute of International Law (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, pp. 127–128 and 130–133). For the contrary persuasion, see e.g. the observations of Messrs Jiménez de Aréchaga and Sette Câmara (*ibid.*, pp. 130–131). The resolution as adopted provides only, in art. VIII, for the desirability of appropriate technical and other assistance to developing States in order to assist them to fulfil the obligations and implement the recommendations of the resolution (*ibid.*, p. 201).

[575] As presented in the proposed article, the duty is predicated upon the objective condition of the waters and is not satisfied simply by "reasonable diligence" on the part of the polluting State; measures must be effectively implemented and the required level in fact achieved. Therefore it is an obligation to render a certain result and not to engage in a certain "amount" of conduct. However, State responsibility under these articles (and presumably liability for fault) would attach only if appreciable harm or the breach of another duty occurred, *and* the harm or other breach was not permissible within the equitable participation of the offending system State. See the note by the OECD Secretariat, "Observations on the concept of the international responsibility of States in relation to the protection of the environment" (OECD, *Legal Aspects of Transfrontier Pollution* (*op. cit.*), p. 380); ". . . the factor taken into consideration is not the (subjective) behaviour of a State, but the (objective) occurrence of damage outside the area under its jurisdiction" (*ibid.*, p. 386). On the thorny question of conduct versus result with respect to pollution of international rivers and lakes, see *inter alia* the discussion reported in *Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, pp. 108 *et seq.*, Handl, "State liability for accidental transnational environmental damage by private persons", *American Journal of International Law*, vol. 74, No. 3, 1980, especially pp. 540–553, and works and practice there cited; Dupuy, "Due diligence in the international law of liability" (OECD, *Legal Aspects of Transfrontier Pollution* (*op. cit*), p. 369); Jiménez de Aréchaga, "International law in the past third of a century", *loc. cit.*, pp. 267–273.

harm has been or is being caused; in turn, this exemption has a limitation: the intermediary system State is under a duty to work in concert with other system States to avoid the appreciable harm to a sister system State from pollution originating in another system State. Such "in concert" co-operation might involve, for example, monitoring or control measures on the territory of the exempt system State, or a combination of efforts as part of a joint programme to control pollution of various kinds and origins. Here, "on an equitable basis" refers primarily to the sharing of costs, or making contribution or compensation with respect to benefits to other system States and adverse effects in the territory of, or the sacrifice of beneficial uses in whole or in part by, the exempt system State.

325. The principle of compensation is also central to paragraph 4 of the article. A system State may suffer harm to its industry or agriculture that from a legal point of view does not rise to the threshold level of "appreciable" harm. Elimination or diminution of the harm-causing pollution, if deemed worth while by the affected system State, may be most effectively or economically undertaken on the territory of the system State in which the pollution originates. According to this provision, a system State causing such pollution is under a duty, on request, to institute abatement measures, but only reasonable measures, on condition that the benefiting system State or States pay the reasonable costs thereof. As part of a larger international watercourse system management, or regional development plan, specific payment might not be exacted and the abatement measures of the polluting State may result from a total benefit/cost analysis undertaken by the system States collectively; therefore a requesting system State is under a duty to pay for the "reasonable measures" only if the system State or States taking the measures demand compensation for the measures as such. In all likelihood, this rule would normally result in consultations that would generate a "package" of co-operative measures of some benefit and of some cost to each co-operating system State.

326. As was manifest from the summarized technical information presented earlier in this section, undifferentiated generalities on prevention or abatement of pollution are not satisfactory with respect to any international watercourse system currently or prospectively subjected to intensive or multiple use. The practical requirement of lists of discrete substances, founded upon the conditions of the particular watercourse, cannot in a residual rule be made absolute. Nonetheless, it is timely and necessary to impose a duty to consult in this regard in the light of what we know about the many substances and species that have an adverse impact upon water quality and the environment. It may be that system States first need to assess the state of the waters, measuring and studying a number of known or suspected pollutants; on the other hand, or at least in due course, agreed prohibitions on the introduction of designated substances or species, and also agreed quantitative limitations with respect to other items, may be called for. The lists and standards will be subject to revision in the light of experience and further studies. Paragraph 5 reflects the current pressing need for such agreed differentiations, already completed for a number of important international watercourses.

327. Paragraph 6 expresses the extraordinary concern for the protection of human life and health by proscription of pollution that results in loss of life or health. The paragraph is cast in objective terms. This rule could not be invoked on the basis of speculation that a certain pollution *may* cause such hazards. On the other hand, it is not necessary that one or more persons die or be beset by disfigurement or debilitating illness. It is intended that it would suffice to show that the kind and rate of the given pollution has caused or will in fact cause the proscribed result, even elsewhere. The paragraph also anticipates that, despite the prohibition (failing an agreement among the States concerned), pollution seriously hazardous to human health and life may occur. Once the deed is done, and above and beyond the question of international responsibility for the harm caused, the polluting State must take speedy action to put an end to the hazard-causing pollution.

328. Today and in the future, effective pollution control and environmental protection is and will increasingly be a matter of quite technical and complex tasks rather than of abstract principles. Paragraph 7 endeavours to foster the elaboration and implementation of particularized programmes to avert environmental damage of an appreciable or irreversible nature, involving the international watercourse system, by affirmatively requiring the system States to establish the necessary régimes for the purpose. The system States have a choice. They may individually pursue the goal or they may join forces. The actual requirement is only that the régime be such that the specified environmental degradation will not occur.[576]

329. In the preceding presentation on this subtopic, the impact of river-caused pollution on the marine environment was shown to be a major concern of the international community. Because the pollution or other damage-causing activity may originate far upstream, or result from a toxic combination of pollutants introduced in the territories of two or more system States, and because the damage is not limited to the freshwater system, a separate provision is called for. Indeed, omission in the Commission's articles of a rule encompassing the freshwater/maritime water interface would only perpetuate the gap that has appeared as the result of inattention by many of the jurists specialized in the law of international watercourses and many of the jurists specialized in the law of the sea.[577] Paragraph 8 of the proposed article is declaratory of a joint

[576] "The discharge into the aquatic environment of dangerous substances that are toxic, persistent and bio-accumulative should be gradually eliminated" (*Report of the United Nations Water Conference . . .*, p. 28 (recommendation 39 (*d*)).)

[577] "It is estimated that 60–80 per cent of the commercial marine fisheries species are dependent upon estuarine ecosystems during part or all of their life cycles" (*The Global 2000 Report* (*op. cit.*), p. 303). See also "River discharge and marine pollution", report of the Secretary-General to the Committee on Natural Resources (E/C.7/2/Add.8/Rev. 1), especially paras. 21–23 and 25–26. It may merit mention that some scientists, including some of those who struggled for years to gain recognition of the vulnerability of the maritime environment, are now concerned that the present "preferential status" of oceans is misplaced. Protection of the enormous volume of saltwater resources (compared with the earth's freshwater resources) may lead to even more critical endangerment of our watercourses; waste disposal options, for example, ought to be broadly reviewed, not excluding consideration and evaluation of either oceanic or terrestrial disposition where full treatment cannot or will not be undertaken. The long-term consequences of contamination of groundwater are of particular concern.

responsibility of the system States. As in other respects, the measures to be taken are to be on an equitable basis.

330. A system State is not held responsible *per se* for the damage caused to the marine environment by pollution originating in another system State; however, the littoral States of the affected sea, and the international community as a whole, have a right to look to the system States of an international watercourse collectively for the precautionary and the corrective measures necessary to achieve compliance with the duty to protect the marine environment, as found in the applicable treaties and in general international law.[578] The system States of an international watercourse system, in this instance at least, are not free to agree to standards or measures that do not avoid legally impermissible harm to the marine environment. It is, as intended by this paragraph, incumbent upon the system States as a whole to work out adequate arrangements among themselves and see to their enforcement. It would not be practicable, technically or juridically, to require or empower the maritime littoral States concerned to determine in whose jurisdiction a pollution damaging to the marine environment originated, and therefore (in some cases) who is solely responsible, or to prescribe the preventive or corrective measures, progressive or absolute, that one or more system States must undertake. The coastal States concerned should of course inform and conduct consultations with the system States. Above all, the ultimate downstream State, or States, where the international watercourse enters the sea, cannot singly shoulder the responsibility for cleaning up system waters so that they flow into and interact with maritime waters without causing actionable harm.

331. Paragraph 9 treats the extremely hazardous, costly and no longer infrequent occurrence of an "emergency" situation following upon a pollution or environmental "incident", such as a toxic chemical spill or the sudden spread or escape of a water-borne disease or its vector. In order to be able to know what defensive actions to take, and how drastic these must be, system States that will be or are being affected require a full understanding of the hazardous agent, the circumstances of the "incident", and the measures already taken or planned by other system States. In such perilous circumstances, there is no time to "negotiate" an accommodation or common programme. That may need to be done later, but the immediate danger must be confronted without delay.[579] The proposed provision for such emergencies requires transmission by the speediest means at hand of the pertinent information and data and the taking of counter-action by all concerned on an emergency basis. The risks are deemed to be so high and the exigencies such that even a system State that did not cause the incident, but acquiring knowledge of it, is also placed under a duty to communicate that knowledge and to take whatever action it can under the circumstances. Action may be on a joint basis, immediately or as soon as the total response can be concerted. The system States would be well advised to set up in advance machinery for communication with respect to such emergencies, including impending emergencies, and their consultations or negotiations under paragraph 7 of this article may result in a warning system being in place when any emergency or threat is discovered. The clauses here, however, set out a residual rule obliging a best-effort response to imminent situations with a view to averting unacceptable damage or catastrophe.

332. Paragraph 10 makes general and broader the duty of system states to consult that is either express or implicit in other provisions of the article. Arrangements for pollution control and for environmental protection, adequate to achieve compliance with their international law obligations in these fields, are the subject matter of the mandated consultations.[580]

333. Pollution accidents and environmental emergencies call for *ad hoc* responses at once; system-wide pollution and environmental management programmes call for intricate, long-range planning on a broad basis. There are situations that fall in between these two extremes, such as a system State's need to take action in order to avoid breach, or continued breach, of its international duties with respect to pollution control or environmental protection and focusing on a special problem. Paragraph 11 of the proposed article makes it a duty of all system States concerned to negotiate for the purpose of solving the problem at hand.

334. It is now so well accepted that pollution control and environmental protection cannot, in an international watercourse system, be treated rationally without the benefit of pertinent information and data on the various components of the system appertaining to water quality and environmental conditions, that a separate provision is here included, paragraph 12, governing data sharing as it relates to these matters. Whether the system States carry out their studies and devise their programmes separately, or jointly undertake assessments and measures, rather extensive data bases are essential. Article 9, proposed above, imposes a general duty of limited scope. Where pollution or

[578] "Protection of the environment is now a world-wide issue calling for world-wide solidarity" (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 109 (statement by the Rapporteur, J. J. A. Salmon)).

[579] The ECE Committee on Water Problems approved in 1970 recommendations to the Governments of ECE member States concerning the protection of ground and surface waters against pollution by oil, in which the emergency situation is contemplated; Governments should: "render compulsory the immediate reporting . . . of all spillages of oil and oil products likely to contaminate either ground or surface waters; . . . set up systems which in the event of oil accidents would immediately warn water users likely to be affected; . . . arrange with neighbouring countries for joint or co-ordinated action which should usefully be taken with respect to common boundary waters (ground as well as surface) in case of oil accidents and for the prevention of pollution by oil" (E/ECE/WATER/7, annex I, para. 3, subparas. (*c*), (*e*) and (*k*)).

[580] In 1971, in an address entitled "U.S. foreign policy in a technological age", the United States Secretary of State, W. Rogers, said that "perhaps it is time for the international community to begin moving towards a consensus that nations have a right to be consulted before actions are taken which could affect their environment or the international environment at large. This implies, of course, that nations contemplating such actions would be expected to consult in advance other States which could be affected" (*The Department of State Bulletin*, vol. LXIV, No. 1651, 15 Feb. 1971, p. 198). Jiménez de Aréchaga, discussing utilization of international watercourses, finds that an aspect of the general principle of good neighbourliness "is the duty to prevent damage and to agree upon adequate measures *before** the damage is caused. Subsequent liability in the form of monetary compensation is not an adequate solution for any of the parties involved .... It is in the interest of both parties to come to a prior agreement ..." ("International law in the past third of a century", *loc. cit.*, p. 195).

degradation of the environment has become a problem, additional and more task-specific data are required. Many States have adopted the approach of the environmental impact or assessment study as the device to apprise themselves in a systematic fashion of the factual situation in each case. Most writers on the topic endorse that mechanism, though it may bear a variety of names. In the proposed provision, a duty to make such assessments arises only if a system State communicates its desire to make such a study and its willingness to bear its equitable share of the costs thereof. The environmental impact studies here contemplated are to be prepared on a joint basis, with contributions from, and benefits to, each of the participating system States presumed.[581]

335. Paragraph 13 makes express on a general level the right of a system State to call for contributions in cash or in kind when it undertakes or is persuaded to undertake often costly and burdensome actions to control pollution or protect the environment and other system States are beneficiaries of its actions. This is not to say that the system State's measures to prevent appreciable harm need be underwritten by the system State or States whose *rights* are thus protected. Contribution, as a matter of right, is always on an equitable basis. However, an affected system State may of course choose so to assist a co-system State with limited resources and capability in preference to seeking damages for any appreciable harm caused by insufficient or inappropriate measures. It is here provided that a system State lacking resources adequate to control the pollution or protect the environment, after receiving any contribution commitments from co-system States to which it may be entitled, may not throw up its hands or claim that it has done all it can do. It is under a further duty to take advantage of bilateral and multilateral assistance, which can be considerable, in fulfilling its international duties in this area.

336. Finally, paragraph 14 makes it clear that there is no refuge in this article from the duties a system State, or the several system States jointly, may owe to other States with respect to pollution abatement or environmental protection.

G. Prevention and control of water-related hazards

337. Even though some aspects of water-related hazards are governed by the proposed articles 10 and 8 on "Environmental protection and pollution" and "Responsibility for appreciable harm", under this important rubric, often termed "harmful effects of water", specialists traditionally have grouped additional phenomena such as the problem of floods and other natural hazards and conditions.[582] These aspects do not, for their legal significance, depend upon the intervention of man. Use of the water in the ordinary sense may be only partially involved, or not at all. Nonetheless, human activities can, in all probability inadvertently, aggravate or moderate the conditions, and therefore the harm caused. Besides flooding, such hazards and harmful effects include erosion, siltation, avulsion, the break-up of logjams and icejams, flow obstruction, waterlogging, and salt-water intrusion. Often the propagation and diffusion of disease vectors are considered "harmful effects" of water.[583] More recently, the lack of water—drought—has also been placed under this heading; desertification, a more complex and prolonged process, now frequently precipitated and expanded by man's land use practices but associated with protracted if not perennial water shortage, may similarly be so classified.

338. In some cases effects embraced in this category may require centuries to reach significant levels of harm. Often, however, the impact may be swift rather than gradual. In all cases, the proper management of water resources, including international water resources, can alleviate the harm itself, or the conditions that give rise or contribute to the harmful effects; some conditions can effectively be prevented altogether by measures of water resources control. In most international watercourse systems more than one of these "harmful effects" are of social and economic significance. System States have entered into numerous international agreements for their prevention and control.

1. Floods

339. In this section of the report, discussion will be focused, but not exclusively, on the norms of cooperation that appear with respect to flood prevention and control, since it is the most universally experienced and the most developed aspect of the category of "harmful effects".[584] Each of the other hazards or harmful effects is capable of inflicting costly damage to the economies or to the peoples of a region and, under some circumstances, crippling disaster. It can be predicted that increased attention will be given by system States to these water-related problems. More intensive agricultural and other land use practices can be expected to accelerate some of these harmful effects; a concomitant increase in disputes is likely.

[581] Environmental assessment was supported in the Mar del Plata Water conference (see *Report of the United Nations Water Conference* . . ., pp. 108–109, paras. 78–86, and p. 25, para. 36 (*b*), in which the Conference recommended that countries "arrange for scientific systematic and comprehensive studies of the environmental impact of water projects . . ."). See also OECD Council recommendation C(79)116 on the assessment of projects with significant impact on the environment (OECD, *OECD and the Environment* (*op. cit.*), pp. 99–100).

[582] United Nations, *Management of International Water Resources* . . ., p. 17, paras. 50–51. Responsibility for the flooding of a co-system State's territory was affirmed in principle in the opinion of the Arbitrator (G. Cleveland, President of the United States) in the *San Juan River* Case (1888) (Costa Rica-Nicaragua):

"The Republic of Costa Rica cannot prevent the Republic of Nicaragua from executing . . . within its own territory such works of improvement, *provided* such works of improvement do not result in the occupation or flooding or damage of Costa Rica territory. . . . The Republic of Costa Rica has the right to demand indemnification . . . for any lands on the [right] bank [of the river San Juan] which may be flooded or damaged in any other way in consequence of works of improvement" (J. B. Moore, *History and Digest of International Arbitrations to which the United States has been a Party*, vol. II (Washington, D.C., U.S. Government Printing Office, 1898), pp. 1965–1966).

[583] The matter of disease vectors has been treated in sect. F above, "Environmental protection and pollution".

[584] In an observation preliminary to this 1905 Award, the arbitrator, Colonel MacMahon, in the question of the partition of the waters of the Helmand (Afghanistan-Iran), said: "Seistan [a place on the river] suffers more from excess than deficiency of water. Far more loss is caused by damage done to land and crops year after year by floods than is caused by want of water for irrigation" (*Helmand River Delta Commission, Afghanistan and Iran* (Washington, D.C., Feb. 1951), p. 141) (the text of the award is reproduced in *Yearbook* . . . *1974*, vol. II (Part Two), p. 189, document A/5409, para. 1036).

340. It may be noted that the Helsinki Rules as adopted by the International Law Association in 1966 did not include articles on hazards or harmful effects.[585] The charge to the Committee that developed the Helsinki Rules was to ascertain and restate the customary international law then governing "the uses of the waters of international rivers". The Committee appreciated that there were other, substantially unexplored aspects of the "international rivers" topic and urged the Association to create a committee to continue work on those related subjects; at Helsinki the Conference recommended reconstitution of the Committee as a Committee on International Water Resources Law, and set forth a number of "selected aspects of water resources law" as illustrative of the "programme of codification and study" the new Committee should undertake.[586] Among the new topics, as delineated by the Committee, were flood control and "protection against harmful effects of waters", "seawater intrusion and salinization" in connection with pollution of underground waters, and "an obligation for a State to co-operate with other States to prevent pollution not caused by human conduct" in connection with pollution of coastal areas and enclosed seas.[587]

341. In 1972, the International Law Association approved articles on flood control as proposed by the Committee.[588] The Committee's report on this topic is valuable. Selected excerpts may be of use:

Floods and their disastrous effects upon the adjoining lands have occupied and vexed mankind since immemorial times . . . It is a probable hypothesis that the problems of control and distribution of waters which faced the early settlers in their valleys thousands of years ago, necessitated the establishment of some . . . form of State organization. Arable land had to be protected from periodic flooding as well as from a lack of water in times of drought. The peace of the community had to be preserved from being disturbed by continual disputes . . . It is significant that the Chinese word "Tschin" has the double meaning of "rule" and "to regulate water", and that the Pharaoh had the title "Guardian of the Waters" . . .

. . . Large amounts of money have to be spent every year to provide relief for flood-affected people and to repair public works. Permanent damage is done by floods when they leave behind swamps as a potential for disease and epidemics, or when stagnating flood and its subsequent evaporation during the dry season causes the accumulation of harmful salts, thus laying waste vast stretches of good land.

. . .

Of the various causes of floods, the most important are: intense and prolonged rainfall, thunderstorms, hurricanes, cyclones, snowmelts, ice jams, slips from mountain sides and overtopping and failure of tanks, reservoirs, dams, bursting of lakes causing a sudden release of large volumes of water, choking up of tributaries by the main rivers at their outfalls, . . . inadequate and inefficient drainage in low-lying and flat areas, silting of river beds due to large amounts of silts brought down by the rivers, earthquakes, land-slides and erosion, . . . and lack of proper controlling structures. . . .

Some of the usual methods which have been developed to minimize the damage created by floods are the following:

(1) Construction of dykes, flood walls, levees, or embankments to protect lands from flood waters. . . .

(2) Increasing the discharge capacity of the main channel by either straightening or widening or deepening or by a combination of all of the three.

(3) Diverting part or whole of the flood waters in excess of the carrying capacity of the main channel.

(4) Constructing reservoirs to withhold flood waters temporarily and release them later on in such quantities as the channel is capable of carrying.

(5) Taking steps to decrease the rate of discharge by improved land use practice, e.g. afforestation, substitution of erosion-inducing crops by soil-protecting crops.

(6) Use of flood forecasting and issue of early warnings to minimize loss to life and property.[589]

Without doubt, agreement upon and implementation of any of the described measures of prevention and mitigation becomes much more difficult when the watercourse is international. Detailed, uniform rules applicable to all international watercourses would be chimerical. "Besides, nearly all hydraulic works, whether they are carried out for flood-control purposes alone or combined with other purposes, produce multiple secondary effects . . ."[590] But the development even of general principles had been neglected by the international legal community. The Committee's articles were therefore "an effort to fill an obvious gap in international water law and thereby to contribute to the mitigation of human suffering caused by human omission to control nature".[591] The articles of the International Law Association constitute the only major effort at stating general rules and recommendations in this field and bear close scrutiny:

Article 1

In the context of the following articles,

1. "Floods" means the rising of water levels which would have detrimental effects on life and property in co-basin States.

2. "Flood control" means the taking of all appropriate steps to protect land areas from floods or to minimize damage therefrom.

Article 2

Basin States shall co-operate in measures of flood control in a spirit of good neighbourliness, having due regard to their interests and well-being as co-basin States.

Article 3

Co-operation with respect to flood control may, by agreement between basin States, include among others:

(*a*) Collection and exchange of relevant data;

(*b*) Preparation of surveys, investigations and studies and their mutual exchange;

(*c*) Planning and designing of relevant measures;

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[585] These considerations, however, while collateral to the mission of the ILA Committee on the Uses of the Waters of International Rivers, were not entirely ignored in the commentary. The value of "conservation measures through the control of seasonal flooding", for example, is brought out (commentary to art. V), and "to be 'substantial' an injury in the territory of a State need not be connected with that State's *use** of the waters" (commentary to art. X). (ILA, *Report of the Fifty-second Conference* . . ., pp. 489 and 500). Dealing with compensation for injury (art. XI), the ancient case is cited of serious flood damage done to Galatia and Phrygia by the blocking by the King of Cappadocia of the outlet of the Melanus river (resulting in payment of damages) (*ibid.*, p. 503). Discussing the duty to maintain the navigable course of a river or lake within a riparian State's jurisdiction in good order (art. XVIII), "maintenance" is defined as including "removal of any obstruction to navigation . . ." (*ibid.*, p. 510).

[586] Resolution I (*ibid.*, p. xi). The ILA Executive Council established the new Committee at its meeting of 12 November 1966; the Committee subsequently established six working groups and to date continues its work (see ILA, *Report of the Fifty-third Conference, Buenos Aires, 1968* (London, 1969), pp. 509–538).

[587] *Ibid.*, pp. 523, 522, 526, respectively.

[588] ILA, *Report of the Fifty-fifth Conference*, . . ., pp. xiv–xviii.

[589] *Ibid.*, pp. 43–45 (Rapporteur: F. J. Berber).

[590] *Ibid.*, p. 46.

[591] *Ibid.*

(*d*) Execution of flood control measures;
(*e*) Operation and maintenance of works;
(*f*) Flood forecasting and communication of flood warnings;
(*g*) Setting up of a regular information service charged to transmit the height of water levels and the discharge quantities.

Article 4

1. Basin States should communicate amongst themselves as soon as possible on any occasion such as heavy rainfalls, sudden melting of snow or other events likely to create floods [or] dangerous rises of water levels in their territory.

2. Basin States should set up an effective system of transmission in order to fulfil the provisions contained in paragraph 1, and should ensure priority to the communication of flood warnings in emergency cases. If necessary a special system of translation should be built up between the basin States.

Article 5

1. The use of the channel of rivers and lakes for the discharge of excess waters shall be free and not subject to any limitation provided this is not incompatible with the object of flood control.

2. Basin States should maintain in good order their portions of watercourses including works for flood control.

3. No basin State shall be prevented from undertaking schemes of drainage, river draining, conservation of soil against erosion and dredging, or from removal of stones, gravel or sand from the beds of its portions of watercourses provided that, in executing any of these schemes, it avoids any unreasonable interference with the object of flood control, and provided that such schemes are not contrary to any legal restrictions which may exist otherwise.

4. Basin States should ensure the prompt execution of repairs or other emergency measures for minimization of damage by flooding during periods of high waters.

Article 6

1. Expenses for collection and exchange of relevant data, for preparation of surveys, investigations and studies, for flood forecasting and communication of flood warnings, as well as for the setting up of a regular information service shall be borne jointly by the basin States co-operating in such matters.

2. Expenses for special works undertaken by agreement in the territory of one basin State at the request of another basin State shall be borne by the requesting State, unless the cost is distributed otherwise under the agreement.

Article 7

A basin State is not liable to pay compensation for damage caused to another basin State by floods originating in that basin State unless it has acted contrary to what could be reasonably expected under the circumstances, and unless the damage caused is substantial.[592]

342. The articles on flood control of the International Law Association are accompanied by surveys of existing treaty obligations to consult, to inform and to exchange data, and to operate warning systems, and on the preparation of surveys and studies, on the planning and execution of flood control measures, on the operation and maintenance of works, etc.[593] For example, Norway and the Soviet Union have agreed to exchange "as regularly as possible such information concerning level and volume of, and ice on, frontier waters as might avert damage or danger from flooding or ice".[594] Annex A to the Columbia River Basin Treaty of 1961 (Canada-United States of America) includes these pertinent provisions:

General

. . .

2. A hydrometeorological system, including snow courses, precipitation stations and streamflow gauges will be established and operated . . . for use in establishing data for detailed programming of flood control and power operations. Hydrometeorological information will be made available to the entities in both countries for immediate and continuing use in flood control and power operations.

3. Sufficient discharge capacity at each dam to afford the desired regulation for power and flood control will be provided through outlet works and turbine installations . . . The discharge capacity provided for flood control operations will be large enough to pass inflow plus sufficient storage releases during the evacuation period to provide the storage space required . . . .

. . .

Flood control

5. For flood control operation, the United States entity will submit flood control operating plans which may consist of or include flood control storage reservation diagrams and associated criteria for each of the dams. The Canadian entity will operate in accordance with these diagrams or any variation which the entities agree will not derogate from the desired aim of the flood control plan. The use of these diagrams will be based on data obtained in accordance with paragraph 2. The diagrams will consist of relationships specifying the flood control storage reservations required at indicated times of the year for volumes of forecast runoff . . .[595]

343. The 1964 Agreement between the Soviet Union and Poland provides:

The contracting parties shall take co-ordinated action with a view to the elimination or reduction of danger resulting from floods, drifting ice and other natural phenomena and shall determine the manner in which the costs connected with the execution of joint works are to be met.[596]

Romania and Yugoslavia have agreed as follows in this respect:

The co-ordination of the prompt exchange of information on the occurrence of high water, ice and other dangers, of measures for protection against flooding, ice and other dangers, of the operation of water control installations, and of the maintenance of water control systems, shall be examined urgently by the Mixed Commission, which shall propose to the Governments of the contracting States in this connection joint regulations for protection against flooding or any other provision under which such co-ordination is to be effected . . .[597]

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[592] *Ibid.*, pp. 46–88 (including commentary). An eighth article, on settlement of disputes, is here omitted. The Institute of International Law has not developed this "hazard" aspect of the topic beyond rule II (5) included in its 1911 "Madrid resolution": "A State situated downstream may not erect or allow to be erected within its territory constructions or establishments which would subject the other State to the danger of inundation" (*Annuaire de l'Institut de droit international, 1911* vol. 24, p. 366). (The rules are reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 200, document A/5409, para. 1072.)

[593] ILA, *Report of the Fifty-fifth Conference . . .*, pp. 49–97.

[594] Art 15 of the 1949 Agreement between Norway and the Soviet Union concerning the régime of the frontier and procedure for the settlement of frontier disputes (United Nations, *Treaty Series*, vol. 83, p. 352).

[595] *Ibid.*, vol. 542, p. 280.

[596] Art. 8, para. 2 (*ibid.*, vol. 552, p. 194).

[597] Art. 3 of the 1955 Agreement concerning questions of water control on water control systems and watercourses on or intersected by the State frontier, and Statute of the Yugoslav-Romanian Water Control Commission (United Nations, *Legislative Texts . . .*, pp. 929–930). Pursuant to this article, the Yugoslav-Romanian Water Control Commission adopted in 1957 "Joint regulations for flood control on watercourses and water control systems on or intersected by the Yugoslav-Romanian State frontier" (Federativne Narodne Republike Jugoslavije, *Medunarodni Ugovori, 1958*, No. 7, p. 73). Similarly, the Yugoslav-Hungarian Water Economy Commission adopted in 1958 "Regulations for flood and ice control on sectors of watercourses of common interest", in accordance with art. 4, para. 2, of the 1955 United Nations Agreement between the two Governments (*ibid.*, No. 11, p. 50, and United Nations, *Legislative Texts . . .*, p. 832).

344. In the 1944 Treaty between Mexico and the United States of America, it is provided that their International Boundary and Water Commission

shall study, investigate, and prepare plans for flood control works, where and when necessary, . . . on the Rio Grande (Rio Bravo) from Port Quitman, Texas, to the Gulf of Mexico. These works may include levees along the river, floodways and grade control structures, and works for the canalization, rectification and artificial channelling of reaches of the river. The Commission shall report to the two Governments the works which should be built, the estimated cost thereof, the part of the works to be constructed by each Government, and the part of the works to be operated and maintained by each section of the Commission. Each Government agrees to construct, through its section of the Commission, such works as may be recommended by the Commission and approved by the two Governments . . .[598]

345. In 1946, Iraq and Turkey entered into an agreement for the purpose, among others, of avoiding the danger of floods during the annual high water periods.[599] The 1960 Indus Waters Treaty between India and Pakistan also carries a provision concerning the execution of "any scheme of flood protection or flood control".[600] With respect to the Lower Mekong Basin, the delegations of Cambodia, Laos, Thailand and the Republic of Viet Nam made a joint statement expressing the wish that ECAFE continue its studies, jointly with their countries, in order to determine, *inter alia*, "in what measure the various projects concerning . . . drainage and flood control can be of use to several countries".[601]

346. Guatemala and Mexico agreed in 1961 to establish an International Commission on Boundaries and Waters. Included among the functions of the Commission was the study of matters relating to flood control; questions relating to flood control works, as well as utilization questions, were to be dealt with in accordance with the norms and principles recognized under international law and advocated by international organizations and compatible with the best interests of their peoples.[602]

347. In their 1969 Convention concerning development of the Rhine, France and the Federal Republic of Germany, recognizing "the advantage for both States of undertaking the joint development of the course of the Rhine between Strasbourg/Kehl and Lauterbourg/Neuburgweier", agreed, among other things, and on the basis of the findings of the Commission to Study Flooding of the Rhine, to conclude an additional agreement as soon as possible "concerning measures to be taken for protection against flooding and apportionment of the resulting costs, taking into account the contributions of all kinds to be expected from the other State concerned".[603] But without waiting for that agreement to be concluded, the parties

shall immediately make all appropriate arrangements to ensure that works situated between Basel and Iffezheim are operated in such a way as to reduce, to the fullest extent possible, the cresting of floodwater downstream of the Iffezheim barrage. The competent authorities of the Contracting Parties shall co-operate directly in the establishment and application of such operating instructions as may be necessary for that purpose.[604]

348. The Inter-American Economic and Social Council at its fourth annual meeting in 1966 recommended:

To the member countries of the Alliance for Progress that . . . they begin or continue joint studies looking towards the control and economic utilization of the hydrographic basins and streams of the region of which they are a part, for the purpose of promoting, through multinational projects, their utilization for the common good, in transportation, the production of electric power, irrigation works, and other uses, and particularly in order to control and prevent damage such as periodically occurs as the result of rises in the level of their waters and consequent floods.[605]

349. Numerous other illustrations from treaty practice could be cited to support the conclusion that system States have long recognized the need for the control and prevention not only of floods but also of similar hazards.[606] Instances are equally frequent of provision

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[598] Art. 6 (United Nations, *Treaty Series*, vol. 3, pp. 327–328). A similar provision (art. 13) pertains to the Lower Colorado River (*ibid.*, p. 340). France and the Federal Republic of Germany, by their Treaty of 1956 concerning the settlement of the Saar question, agreed (art. 9) to maintain a water-level reporting service; should a flood warning be given, the parties' services shall remain in constant contact until communication of the end of the alert is received from the Saarebruck station (United Nations, *Legislative Texts . . .*, p. 659). By the 1959 Agreement between Yugoslavia and Greece concerning hydro-economic questions, the contracting States agreed (art. 5) that the competent local authorities would advise each other by the most rapid means of any danger of high water, as well as of other dangers threatening the régime of waters and the operation of hydro-technical installations (United Nations, *Treaty Series*, vol. 363, p. 137).

[599] Protocol No. 1 relative to the regulation of the waters of the Tigris and Euphrates and of their tributaries (*ibid.*, vol. 37, p. 287). Concerning the right of the Netherlands to close off the former mouth of the Rhine near Lobith during the high water season as a protection against floods, see art. 1 of the 1918 Treaty between the Netherlands and Germany concerning the raising of the level of the former mouth of the Old Rhine (League of Nations, *Treaty Series*, vol. XIII, p. 47).

[600] Art. IV, para. 2 (United Nations, *Treaty Series*, vol. 419, p. 136). See also art. IV, para. 8 (*ibid.*, p. 138). Flood control was also the first named purpose of the 1954 Agreement between India and Nepal on the Kosi project (clause 1) (United Nations, *Legislative Texts . . .*, p. 291).

[601] *Official Records of the Economic and Social Council, Twenty-fourth Session, Supplement No. 2* (E/2959), para. 277. ECAFE endorsed the statement, which was based on an ECAFE document "Development of water resources in the Lower Mekong Basin" (ECAFE/L.119).

[602] Exchange of notes of 9 November and 21 December 1961 (see *Yearbook . . . 1974*, vol. II (Part Two), pp. 292–293, document A/CN.274, para. 69).

[603] Preamble and art. 9, para. 1 (United Nations, *Treaty Series*, vol. 760, pp. 346 and 354).

[604] Art. 9, para. 2 (*ibid.*, p. 354). Each of the parties is also to ensure that "sufficient lands to hold one half of the volume of water which must still be retained in order to reduce the cresting of floodwater remain available in its territory" (art. 9, para. 3).

[605] Resolution 24-M/66, "Control and economic utilization of hydrographic basins and streams in Latin America" (Pan American Union, *Final Report of the Fourth Annual Meeting of the Inter-American Economic and Social Council*, vol. I (*op. cit.*), p. 48). (Reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 351, document A/CN.4/274, para. 380.) The resolution begins with this statement:

"Whereas: Control and better utilization of the hydrographic basins and streams that . . . make up a part of the common patrimony . . . will help to speed up the integration and multiply the potential capacity for development of those countries." See also "Trends and problems in water administration in the ECAFE region", paper prepared by the ECAFE secretariat (United Nations, *Proceedings of the Interregional Seminar on Current Issues of Water Resources Administration* (New Delhi, 22 Jan.–2 Feb. 1973), p. 41, and works there cited); B. Palta, "Co-ordination of sectoral water policies and planning: some models" (*ibid.*, pp. 79–80); W. R. D. Sewell, *Water Management and Floods in the Fraser River Basin* (Chicago, Ill., University of Chicago, 1965); G. F. White, *Choice of Adjustment to Floods* (Chicago, Ill., University of Chicago, 1964).

[606] For example, the 1964 Agreement between Poland and the USSR concerning the use of frontier waters provides that the parties

for warnings and for the exchange of information and data specifically pertaining to hazards on a regular basis.[607] In many international agreements the aspect of control or prevention of hazards is not explicit but is presumed, and subsumed under provisions for control of flow, that is, river "training" or regulation.[608]

2. Ice conditions

350. As will have been noted from some of the examples already given, the problem of damage from ice ranks with floods as a concern to many system States located in the northern latitudes. A few additional examples from treaty practice will serve to demonstrate the dimensions of this hazard.

351. The 1952 Agreement between the Democratic Republic of Germany and Poland devotes a chapter to "Principles of co-operation in precautionary measures against flooding and ice floes", which includes these provisions with respect to ice:

> The two contracting parties undertake to exercise joint vigilance and to co-operate with each other to prevent the formation of potentially dangerous ice barriers . . .
>
> The Polish party shall inform the German party in good time of the place and time of ice clearance operations . . .
>
> Ice-breaking operations shall proceed upriver from the mouth of the Oder. Where necessary, and provided that no danger to the lower reaches of the river is entailed, local ice barriers may be demolished by blasting . . .[609]

352. The 1958 Agreement between Bulgaria and Yugoslavia concerning water economy questions delegates to the frontier and local authorities the duty to "advise each other, by the most rapid possible means, of any danger from . . . drifting ice . . . on rivers and tributaries followed or intersected by the State frontier", as well as from high water or any other danger that may arise.[610] Austria and Czechoslovakia have agreed to promote the construction of hydraulic installations and facilities to provide protection against the danger, along their frontier waters, of ice, as well as from flooding.[611]

3. Drainage

353. Works to improve or ensure adequate drainage, and to regulate discharges made for drainage purposes, have also been the subject matter of a good number of international agreements. With respect to four drainages specifically identified, Pakistan agreed in its Indus Waters Treaty with India to maintain "in good order its portion of the drainages" and with undiminished capacities; Pakistan also agreed to undertake the deepening or widening of any of those drainages, should India find such drainage improvement necessary and provided that India agreed to pay the cost.[612] And in the article, "Future co-operation", the parties "recognize that they have a common interest in the optimum development of the rivers" and declare their intention in particular to co-operate, *inter alia*, with respect to new drainage works.[613]

354. Among other illustrations of State practice, the Netherlands and the Federal Republic of Germany, in their Frontier Treaty signed in 1960, agreed to "take or support, within an appropriate period of time, all measures required" to secure and maintain "the adequate drainage of the boundary waters, to the extent required in the interest of the neighbouring State".[614]

355. Albania and Yugoslavia have agreed to examine and to resolve by agreement all water economy questions, including measures and works of interest to either party or to them both, which may affect the

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shall take co-ordinated action with a view to the elimination or reduction of danger resulting from "floods, *drifting ice and other natural phenomena*"* (art. 8, para. 2) (United Nations, *Treaty Series*, vol. 552, p. 194).

[607] See e.g. art. 8, para. 1, of the 1958 Agreement between Czechoslovakia and Poland concerning the use of water resources in frontier waters, requiring the parties to provide reports on various hazards and on water-level forecasts, as well as on hydrological research results and the texts of relevant laws and regulations (*ibid.*, vol. 538, p. 112); art. 21 of the 1961 Treaty between Poland and the USSR concerning the régime of the frontier and co-operation and mutual assistance in frontier matters (*ibid.*, vol. 420, p. 258); art. 20 of the similar Treaty between Hungary and Romania of 1963 (*ibid.*, vol. 576, p. 350); and art. 4 of the 1964 Agreement between Bulgaria and Greece on co-operation in the utilization of the waters of the rivers crossing the two countries (see *Yearbook . . . 1974*, vol. II (Part Two), p. 315, document A/CN.4/274, para. 271).

[608] "Training" or "regulation", however, embraces other aspects of water resources management (see chap. III, sect. A, below).

[609] Art. 19 (United Nations, *Treaty Series*, vol. 304, pp. 171–172). See also art. 1 (*c*) of the 1955 Agreement between Romania and Yugoslavia concerning questions of water control (United Nations, Legislative Texts . . ., p. 928); art. 2, para. 2, of the 1958 Agreement between Czechoslovakia and Poland concerning the use of water resources in frontier waters (United Nations, *Treaty Series*, vol. 538, pp. 108–110).

[610] Art. 8 (*ibid.*, vol. 367, p. 110). See also art. 11 of the 1956 Treaty between Austria and Hungary concerning the regulation of water economy questions in the frontier region (*ibid.*, vol. 438, p. 158); art. 19 of the 1950 Treaty between Hungary and the USSR concerning the régime of their frontier (United Nations, *Legislative Texts . . .*, p. 825); art. 7 of the 1954 Mura Agreement between Austria and Yugoslavia (United Nations, *Treaty Series*, vol. 396, p. 104); art. 17 of the 1960 Agreement between Finland and the USSR concerning the régime of their frontier (*ibid.*, vol. 379, p. 344); art. 15 of the 1956 Treaty between Hungary and Czechoslovakia concerning the régime of their frontiers (*ibid.*, vol. 300, p. 162); art. 19 of the 1956 Agreement between the USSR and Czechoslovakia concerning the régime of their frontier (*ibid.*, vol. 266, p. 314).

[611] Art. 4, para. 2, of the 1967 Treaty concerning the regulation of water management questions relating to frontier waters (*ibid.*, vol. 728, p. 356). Art. XII of the 1816 Boundary Treaty between Prussia and the Netherlands prohibited the erection in the river of works likely to prevent the passage of ice, or to hinder the flow of water, and thereby cause damage to the opposite bank, failing prior agreement between the parties (United Nations, *Legislative Texts . . .*, p. 737).

[612] Art. IV, paras. (4) and (5) (United Nations *Treaty Series*, vol. 419, p. 138). The 1954 Agreement between India and Nepal on the Kosi project also provides for drainage (clause 13). United Nations, *Legislative Texts . . .*, p. 294).

[613] Art. VII, para. (1) (United Nations, *Treaty Series*, vol. 419, p. 144). Art. VII, para. (1) (*b*) provides:

> "Each party, to the extent it considers practicable and on agreement by the other party to pay the costs to be incurred, will, at the request of the other party, carry out such new drainage works of the other party" (*ibid.*, p. 146).

On the other hand, art. IV, para. (3), provides:

> "Nothing in this Treaty shall be construed as having the effect of preventing either party from undertaking schemes of drainage, river training, conservation of soil against erosion and dredging . . .", provided that "any material damage to the other party" is avoided as far as practicable and does not involve, on the western rivers, any use of water or any storage by India beyond that provided under article III" (*ibid.*, p. 136).

[614] Art. 58, para. 2 (*a*) (*ibid.*, vol. 508, p. 190). Under art. 57, the parties agreed to conduct "regular consultations on all questions relating to the use and management of water resources" in their Permanent Boundary Waters Commission and its sub-commissions. See also annex A of the Treaty (*ibid.*, p. 212).

quantity and quality of the water.[615] Among particular questions identified is the discharge and drainage of water, preceded by regulation and canalization of watercourses and followed by protection against flooding.[616] Poland and the Soviet Union have determined that their "competent authorities" will agree upon the method of regulating drainage into frontier waters, as well as upon all other questions relating to the frontier régime.[617] The 1963 Protocol between Greece and Turkey concerning the final elimination of differences over the execution of hydraulic operations for the improvement of the bed of the river Meriç-Evros carried out on both banks sets forth the parties' rights and obligations in connection with the installation of drainage systems and pumping stations, as well as with regard to the strengthening or construction of dikes.[618]

356. Adequate drainage of surplus waters is an ancient problem.[619] Lack of it ruins soils, keeps groundwater tables injuriously high and causes standing, stagnant water, or local flooding.[620] It is not surprising in this context that drainage and flood prevention have often been linked in State practice, since improved drainage increases the flow of water in the watercourse into which the drains discharge. Uncontrolled discharges of drainage waters can mean the inundation of the territory of downstream system States. Drainage has thus been the subject of system-State agreement for the purpose of flood control or prevention.[621]

357. Austria and Czechoslovakia, in their Treaty of 1928 regarding the settlement of legal questions connected with the frontier, required that the legitimate interests of the inhabitants of the other State be taken into account, as far as possible, if "the construction of an installation is calculated to cause any considerable or permanent change in the supply of water of a frontier waterway or of a waterway which cuts the frontier".[622] The following provision indicates the broad, multipurpose scope of the parties' thinking about hydraulic installations:

> 1. The contracting States shall promote the construction of such works as are designed to protect the frontier waters and the contiguous flood area against damage by floods, *and ensure the draining** and irrigation of the adjacent territory, or as the case may be, regularize the flow of water, provide the frontier communes with water, and ensure the utilization of the waterpower supplied by the frontier waterways.
>
> 2. . . . the contracting parties agree as to the following principles:
>
> . . .
>
> (*b*) When systematically regularizing a frontier waterway . . ., care shall be taken to secure as far as possible the normal outflow of medium high water . . . Care shall also be taken . . . to avoid any excessive draining of the land situated on one side or the other, and to facilitate the employment of muddy water on this land and its irrigation during periods of drought.[623]

358. On this record, it can be seen that provisions governing drainage in an international watercourse system are well established, not as a use of the waters but as protection against "harmful effects", though drainage or the lack of it may favourably or adversely affects uses (including navigation). The harmful effects of inadequate drainage or of uncontrolled drainage extend beyond water uses to, for example, many land uses, community health and the environment generally. Poor drainage conditions or excess drainage flows usually occur naturally at first, but man's activities may create a need for accelerating or restraining drainage within the watercourse system; that is, man may have had effects upon the system sufficient to make a bad drainage situation worse. The international implications of the problems thus presented have given rise to regulation, if not management, of drainage matters by international agreement. It may now also be possible to enunciate some general principle of international law with respect to co-operation among system States on this matter.

4. Flow obstructions

359. Agreements covering hazards or harmful effects frequently include clauses with respect to obstructions to the flow of the waters, as will have been noted in some of the examples already set forth. Obstructions

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[615] Art. 1, para. 1, of the 1956 Agreement concerning water economy questions (United Nations, *Legislative Texts* . . ., p. 441). The Agreement covers natural surface and underground water as well as artificial waters (art. 1, para. 3).

[616] Art. 1, para. 2.

[617] Art. 17, para. 2, of the 1961 Treaty between the USSR and Poland concerning the régime of the frontier and co-operation and mutual assistance in frontier matters (United Nations, *Treaty Series*, vol. 420, p. 256). It is also stipulated, in art. 17, para. 1, that the "natural flow of water in frontier watercourses and in adjacent areas which are inundated during periods of high water must not be altered or obstructed to the detriment of the other party by the erection or reconstruction of installations or structures in the water on the banks, or in any other way".

[618] See *Yearbook* . . . *1974*, vol. II (Part Two), p. 308, document A/CN.4/274, paras. 206–210.

[619] Among earlier agreements, see the 1816 Boundary Treaty between Prussia and the Netherlands, especially arts. XXIV–XXVII (United Nations, *Legislative Texts* . . ., pp. 737–739); the 1824 Frontier Treaty between the Netherlands and Hanover, especially arts. 34–35, 37–38 and 40 (*ibid.*, pp. 741–744); the 1929 Frontier Agreement between Germany and Belgium, arts. 71–74, which provide for land drainage boards (League of Nations, *Treaty Series*, vol. CXXI, p. 367); the 1922 Agreement between Denmark and Germany relating to watercourses and dikes on the German–Danish frontier, art. 53, first para. (United Nations, *Legislative Texts* . . ., p. 597). The Lausanne Treaty of 1923 between the British Empire, France, Italy, Japan, Greece, Romania, the Serb-Croat-Slovene State and Turkey provided in art. 109:

> "In default of any provisions to the contrary, when . . . the hydraulic system (canalization, inundation, irrigation, drainage or similar matters) in a State is dependent on works executed within the territory of another State, . . . an agreement shall be made between the States concerned to safeguard the interests and rights acquired by each of them.
>
> "Failing an agreement, the matter shall be regulated by arbitration" (League of Nations, *Treaty Series*, vol. XXVIII, p. 95).

Identical provisions are found in art. 309 of the 1919 Treaty of Saint-Germain-en-Laye with Austria (*British and Foreign State Papers*, vol. CXII (London, 1922), p. 469, and in art. 292 of the 1920 Treaty of Trianon with Hungary (*ibid.*, vol. CXIII (London, 1923), p. 618).

[620] Waterlogging and "salinization" of once fertile soil is a well-known consequence of inadequate drainage. This is the case in the Indus Basin (see Baxter, *loc. cit.*). See also resolution VII (Scientific water management: irrigation, drainage and flood control") of the World Food Conference (*Report of the World Food Conference* (Rome, 5–16 Nov. 1974) (United Nations publication, Sales No. 75.II.A.3), pp. 10–11).

[621] See e.g. the 1843 Convention between Belgium and the Netherlands on the discharge of the Flanders waters, art. 8 (United Nations, *Legislative Texts* . . ., p. 543); the 1905 Convention between the Netherlands and Prussia concerning the Dinkel and Vechte rivers, art. I, sect. 4, art. IV, sect. 2, and art. V (*ibid.*, pp. 752–755). See also Gupta, "Brahmaputra River Basin development . . .", *loc. cit.*, pp. 213–219.

[622] Art. 28, para. 3 (League of Nations, *Treaty Series*, vol. CVIII, p. 69).

[623] Art. 29 (*ibid.*, p. 71).

can hinder necessary drainage, or they can impair or interrupt navigation and hydropower generation, for example. They may also enhance the likelihood of floods, if not actually cause them. Obstructions are indeed hazards. State practice indicates that many system States have addressed the problem in their relations with their co-system States.[624]

360. The Indus Waters Treaty is again a clear and recent illustration of this type of concern:

> Each party will use its best endeavours to maintain the natural channels of the rivers . . . in such condition as will avoid, as far as practicable, any obstruction to the flow in these channels likely to cause material damage to the other party.[625]

361. When navigation was the only use of international significance, obstructions affecting navigation received considerable attention. In 1851 Austria and Bavaria agreed that they would remove from the channel "all obstacles to navigation" and "permit no construction on the stream or its banks which would endanger the security of navigation".[626]

362. In 1905 the Netherlands committed itself to Prussia to remove entirely portions of a dam, to observe other requirements designed to ensure certain flows and clearances, and to take "such further measures as may be required to prevent the formation of new obstructions to the free flow of water below the present barrage".[627]

363. The hand of man is by no means requisite to the occurrence of obstructions. Landslides, earthquakes, the accumulation of gravel and sand, and natural logjams, for example, often result in damaging obstruction. The treaty between Poland and the Soviet Union concerning the régime of the Soviet-Polish State frontier, concluded in 1961, requires that the parties jointly take the necessary steps to remove obstacles which may cause displacement of the beds of frontier rivers, streams or canals or which may obstruct the natural flow of water.[628]

364. Thus while strictly speaking "obstructions" are not directly a harmful effect of *water*, they are the occurrence of restriction or blockage that may cause water to have harmful effects, such as flooding, or may be a hazard to the use of the waters for timber floating, navigation or generation of power, among other things. Optimum utilization of international watercourses, including their conservation, control and protection, requires that the Commission should not omit this aspect from its articles.

5. Avulsion

365. There are other hazards and harmful effects that deserve mention. Avulsion, an occurrence that in some watercourses frequently accompanies seasonal high water,[629] can be destructive of human settlements, factories, transportation and communications, livestock and agricultural lands, as the watercourse precipitously abandons the stream bed and is redirected across-country. In addition to engulfing previously dry land, the hydraulic works and other water-related facilities along the old path of the river are deprived, perhaps altogether, of viable connection with the stream. The case of one international watercourse may be sufficient to document the importance of his hazard:

> . . . The past history of the Helmand river in Seistan shows that it has always been subject to sudden and important changes in its course, which have from time to time diverted the whole river into a new channel and rendered useless all the then existing canal systems. Such changes are liable to occur in the future, and great care should therefore be exercised in the opening out of new canals, or the enlargement of old canals leading from the Helmand. Unless this is done with proper precaution, it may cause the river to divert itself entirely at such points and cause great loss to both countries. This danger applies equally to Afghanistan and Persia.[630]

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[624] The operation of hydraulic works and navigation can, of course, be blocked by ice, a hazard already taken up in more general terms. See, in addition, the 1957 Agreement between Norway and the USSR on the utilization of water-power on the Pasvik (Paatso) River, art. 16, second para. (United Nations, *Treaty Series*, vol. 312, p. 286).

[625] Art. IV, para. (6) (*ibid.*, vol. 419, p. 138). The Treaty was concluded between India and Pakistan in 1960.

[626] Art. 12 of the Agreement concerning territorial and frontier arrangements, which also states: "The greatest case shall also be taken to prevent navigation from being obstructed or hindered by mills or other machinery or by the rolling down of blocks from quarries or the disposal of rubbish close to the banks." (United Nations, *Legislative Texts* . . ., p. 464.) The agreements on navigation were reviewed in some detail in the Special Rapporteur's second report (*Yearbook* . . . *1980*, vol. II (Part One), pp. 188 *et seq.*, document A/CN.4/332 and Add.1, paras. 186–214), for the purpose of examining the basis for the sharing of a natural resource. The 1978 Treaty for Amazonian Co-operation, art. VI, and the 1948 Convention regarding the régime of navigation on the Danube, art. 3, there quoted (paras. 206 and 211), also deal with obstruction. The Statute on the régime of navigable waterways of international concern, annexed to the Convention signed at Barcelona in 1921, obliges each riparian State "to take as rapidly as possible all necessary steps for removing any obstacles and dangers which may occur to navigation" (art. 10, para. 1) (League of Nations, *Treaty Series*, vol. VII, p. 57). For the status of the Convention and Statute, see *Yearbook* . . . *1974*, vol. II (Part Two), p. 60, document A/5409, footnote 53.

[627] Art. II, Convention between the Netherlands and Prussia concerning the Dinkel and Vechte rivers (United Nations, *Legislative Texts* . . ., pp. 753–754).

[628] Art. 16, para. 3 (United Nations, *Treaty Series*, vol. 420, p. 254). For similar provisions, see the 1963 Treaty between Hungary and Romania concerning the régime of the frontier, art. 16, para. 2 (*ibid.*, vol. 576, p. 348).

[629] Earthquakes, lava flows and landslides also on occasion cause avulsion.

[630] Clause VIII, Award of 10 April 1905, the *Helmand River Delta* arbitration (see footnote 584 above). For a discussion of the controversy surrounding the award, see *Yearbook* . . . *1974*, vol. II (Part Two), pp. 188–190, document A/5409, paras. 1034–1037, and works there cited. The award was not accepted; however, the veracity of the quoted passage was not at issue.

[631] Dredging and placer mining for precious metals and stones, or dredging for sands and gravels, can result in considerable sediment load, as can overgrazing and other improper agricultural practices. Licences to dredge in the Tanoe River (Ivory Coast and Ghana are the system States today) were formerly required to be approved by the two Governments concerned (Ivory Coast and Gold Coast). See the exchange of notes of 16 and 25 June 1907 between the British and French Governments respecting licences to dredge in the Tanoe River (in completion of the Anglo-French Agreement of 10 August 1889) (United Nations, *Legislative Texts* . . ., pp. 123–124). In fulfilment of the agreed duty "to take or to support all measures required to establish and to maintain within . . . the boundary waters . . . such orderly conditions as will mutually safeguard their interests", the Netherlands and the Federal Republic of Germany, in their 1960 Frontier Treaty, specified in particular, *inter alia*, "all measures" required to prevent "the excessive extraction of sand and other solid substances liable to cause substantial prejudice to the neighbouring State" (art. 58, paras. 1 and 2 (*d*)) (United Nations, *Treaty Series*, vol. 508, p. 190). See also e.g. art. 14 of the 1954 Agreement between Hungary and Czechoslovakia on the settlement of technical and economic questions concerning frontier watercourses (*ibid.*, vol. 504, p. 262). If the introduction of the silt is directly or indirectly caused by the activities of man, the detrimental change in water quality would, of course, meet the test of the definition of pollution (see sect. F above). "Suspended substances and sludge [from the iron and coal and other mining industries] . . . cause silting, which reduces the

(*Continued on next page*)

6. Siltation

366. Some watercourses carry heavy charges of silt. As this sediment load is shifted continually downstream, reservoirs are gradually filled in, spawning beds may be smothered, water supply intakes and treatment plants become clogged or damaged, channels silt up, decreasing the depth of the fairway and harbours, light transmission essential for aquatic life is reduced, and recreational uses are spoiled. Costly dredging and filtration efforts are engaged in and are frequently overwhelmed; in addition, these make no headway against most harmful effects of siltation. The usual remedy prescribed is stabilization of the headwater areas by watershed (or range) management to decrease erosion, the source of the problem. On the other hand, irrigation by inundation has from ancient times depended upon the annual deposit of silt upon agricultural lands for partial renewal of fertility; stemming the transport of silt has major significance for the downstream State dependent upon this "gift" of nature. Although man's activities in the watercourse may cause or increase sediment content,[631] nature is capable of introducing great quantities of sediment into international watercourses. Corrective measures may require extensive and unceasing effort on the part usually of an upstream State whose own uses of the watercourse may be insignificant or unaffected. Clearly, concerted action and contribution by the system States to be benefited by the measures are called for. Austria and Switzerland concluded one of the earliest agreements on record treating this particular problem:

> The Swiss Federal Council and the Government of Austria-Hungary shall make every effort, in the catchment basins of the tributaries of the Rhine, to carry out corrective measures, construct dams and execute other works calculated to retain sediment in order to reduce drifting in the bed of the Rhine as much as as possible and to maintain a regular course for that river in the future.
>
> Each Government reserves the right to determine the time of execution and the extent of the various measures to correct the flow; nevertheless, the work shall be undertaken as promptly as possible and shall be actively pursued, beginning with the tributaries which cause the greatest damage owing to their heavy load of sediment.[632]

367. The Plata international watercourse system in South America suffers exceedingly from the problem of siltation. The Bermejo River, lying in Bolivia and Argentina, tributary to the Paraguay-Paraná subsystem of the Plata, contributes some 70 per cent of the total sediment transported in the whole system.[633] The Paraná's annual silt load is about 250 million tons, two of the results of which are the choked delta where it meets the Uruguay River to form the Plata River and the constant dredging required in the area of the port of Buenos Aires.[634] Several studies have been undertaken on the subject, for example for the multipurpose development of the Bermejo. Eleven projects, including three binational ones, one in Bolivia and seven in Argentina, would, it is estimated, eliminate 95 per cent of the silt the Bermejo delivers into the Paraguay River.[635]

7. Erosion

368. Treaties often speak in terms of erosion control. The 1955 Agreement between Yugoslavia and Romania concerning questions of water control on water control systems and watercourses on or intersected by the State frontier applies, *inter alia*, to "protection against erosion".[636] The Indus Waters Treaty preserves, among other things, the right of each party to undertake schemes for the "conservation of soil against erosion" and dredging, provided that, *inter alia*, material damage to the other party is avoided as far as practicable.[637]

369. Concern is frequently as much for the protection of stream banks or channel depth as it is for reduction of sediment. France and the Federal Republic of Germany have undertaken to develop jointly the course of the Rhine downstream from the Iffezheim barrage "with a view to preventing or remedying erosion of the river-bed".[638]

8. Saline intrusion

370. The penetration of maritime waters upstream from the mouth of a river, and into groundwater aquifers, is a serious "harmful effect" in a number of international watercourse systems. This phenomenon is

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(*Footnote 631 continued*)

number of organisms on which fish feed and forces the fish to migrate. Silted areas become desolate, and an increase in the amount of sludge in the water may hinder the growth of plant life. All these processes reduce the natural capacity of the water for self-purification" (Lester, "Pollution", *loc. cit.* p. 91). On the problem generally, see A. Ron, "Aspectos jurídicos de la sedimentación" International Association for Water Law, *Annales Juris Aquarum-II*, Caracas, 1976), vol. 3, p. 1655).

[632] Art. XVII of the 1892 Treaty for the regulation of the Rhine from the confluence of the Ill, upstream, to the point downstream where the river flows into the Lake of Constance (United Nations, *Legislative Texts* . . ., p. 494). See generally, Florio, *loc. cit.*, p. 591, and *Yearbook* . . . *1974*, vol. II (Part Two), pp. 156–157, document A/5409, paras. 810–817.

[633] G. Cano, *Recursos hídricos internacionales de la Argentina* (Buenos Aires, de Zavalia, 1979), p. 186.

[634] See Hayton, "The Plata Basin", *loc. cit.*, pp. 401 and 440, footnote 374, and "Preliminary review of questions relating to the development of international river basins in Latin America", paper prepared for ECLA under the direction of G. Cano (E/CN.12/511).

[635] Large irrigation and hydropower benefits are also involved. See Cano, *Recursos hídricos* . . ., *op. cit.*, pp. 185–186; Organization of American States, *Cuenca del río de la Plata, estudio para su planificación y desarrollo—I. Alta Cuenca del río Bermejo: estudio de los recursos hídricos* (Washington, D.C., 1974); K. Rodgers, "Estudio piloto sobre medio ambiente, en el desarrollo de la cuenca del río Bermejo", prepared for the Argentine National Commission for the United Nations Water Conference (CONFAGUA/C5/4). All watercourses carry some suspended sediments, and also dissolved salts. Nature's actions, and man's, can augment the quantities to such a degree that sediment (or salt) loads become an overriding problem in some international watercourses such as the Mekong and the Ganges. Generally speaking, much more silt is carried by watercourses in Asia than by watercourses in the rest of the world. See R. J. Gibbs, "The geochemistry of the Amazon river system. Part I. The factors that control the salinity and the composition and concentration of the suspended solids", *Geological Society of America Bulletin* (Boulder, Colo.), vol. 78, Oct. 1967, p. 1203.

[636] Art. 1, second para., subpara. (i) (United Nations, *Legislative Texts* . . ., p. 928). On the relationship between man's activities and erosion/siltation, see e.g. J. Moreno, P. Urriola and G. Colmenares, "Criterios jurídico-institucionales para el desarrollo y conservación de los recursos hidráulicos a nivel de cuencas en Venezuela" *Annales Juris Aquarum-II* (*op. cit.*), p. 1661).

[637] Art. IV, para. (3) (United Nations, *Treaty Series*, vol. 419, p. 136).

[638] Art. 1, para. 1, of the 1969 Convention concerning development of the Rhine between Strasbourg/Kehl and Lauterbourg/Neuburgweier (*ibid.*, vol. 760, p. 347). See also the 1927 Convention between the USSR and Turkey regarding the use of frontier waters, art. 6 (United Nations, *Legislative Texts* . . ., p. 385).

termed saline or saltwater intrusion. Nature accomplishes this infiltration without any assistance from man in most cases,[639] above all during the dry or low-flow season. Yet the abstraction or removal of water from the watercourse, for irrigation for example, reduces the freshwater pressure at the interface even further and results in more maritime water penetration than nature alone inflicts.[640] It is primarily the naturally induced saltwater intrusion that is the subject of discussion at this point—the hazard to health or to uses of the water generally from the increased salinity.[641]

371. Most international watercourse systems, even if not now affected, are potentially vulnerable. High salinity renders the waters unusable for domestic, municipal, agricultural and most industrial purposes; treatment to lower salt content is very expensive, unless quantities of sweet water can be brought in for purposes of dilution.[642]

9. Natural hazards generally and drought

372. There is a considerable technical literature on the hazards and harmful effects just discussed.[643] The international legal literature is little developed,[644] but water lawyers have been emphasizing the need to control or prevent "harmful effects" for many years.[645]

373. The United Nations Water Conference accorded considerable attention to "natural hazards" in its general debate:

> 100. Many countries of the world were prone to hazards caused by extremes of water—floods and droughts . . . The rapid concentration of dwellers in flood plains, and the poor ecological management of areas susceptible to droughts, had contributed to the seriousness of these hazards in terms of loss of life and damage to physical facilities and, in some cases, to damage to the total ecological balance as well as cultures. At present the negative economic impact of water-related natural disasters in developing countries was greater than the total value of all the bilateral and multilateral assistance given to these countries.
>
> 101. It was recognized that emergency measures could not be a substitute for predisaster planning and disaster prevention . . . It was pointed out (*a*) that natural disasters were an important factor of setback to development; (*b*) that they were mostly preventable; . . .
>
> 102. A number of representatives drew attention to the tragic effects of the recent drought in the Sahel region . . . It was noted that the dimension of this catastrophe was due in great part to the weakness of the existing socio-economic structure and the lack of a water-related infrastructure capable of responding to the lack of precipitation. It was further noted that, contrary to generally held opinion, the main problem was not one of fundamental lack of water in the region. Assessment studies in fact showed that the potentially available supply, especially in relation to groundwater, was quite sizeable . . .[646]

374. "Natural hazards", focusing on floods and drought, became the subject of a series of recommendations adopted by the Conference. Excerpts will serve to illustrate the collective concern of the representatives:

> 62. There are extensive areas of the world where severe hydrometeorological phenomena frequently occur and cause great damage . . . Experience shows that, with appropriate combinations of engineering works and non-structural measures, damages can be substantially reduced. It is necessary to plan ahead and co-ordinate the measures that need to be taken . . .
>
> *Flood loss management*
>
> 63. . . . The flood losses can be decreased by comprehensive structural and non-structural precautions and by the organization of

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[639] It should be noted that in extreme cases low-lying coastal areas and deltas may suffer "saline inundation" at certain times of the year. See the case of Bangladesh described by Abbas, "River basin development for socio-economic growth: Bangladesh", *loc. cit.*, pp. 188–190.

[640] If the reduced flow or pressure results from abstraction of water by a co-system State, the coastal system State or States may experience appreciable harm from what would be pollution as defined in sect. D above. The reverse situation, that is, harm done to the maritime waters and marine environment generally by the outflow of contaminated fresh water has already been dealt with in sect. F, "Environmental protection and pollution", above.

[641] Hydraulic works at or near the freshwater/salt water interface may have a role to play in maintaining or defending acceptable salinity levels. See the 1960 Treaty between Belgium and the Netherlands concerning improvement of the Terneuzen and Ghent Canal and settlement of various related matters, title VII, "Salinity and water withdrawal", especially art. 32 (United Nations, *Treaty Series*, vol. 423, p. 66).

[642] Salinity can also be increased to harmful levels as a result of return flows from irrigation. This is a clear case of pollution, however, and without connection with maritime waters. But see e.g. I. Pla and F. Dappo, "Criterios para reglar el uso de aguas salinas en agricultura" *Annales Juris Aquarum-II* (*op. cit*), vol. 3, p. 1687-A); *The Global 2000 Report . . .* (*op. cit*), p. 343.

[643] See *inter alia* United Nations, *Guidelines for Flood Loss Prevention and Management in Developing Countries*, Natural Resources/Water Series No. 5 (Sales No. E.76.II.A.7); Office of the United Nations Disaster Relief Co-ordinator, "Disaster prevention and mitigation", vol. 2: "Hydrological aspects" (UNDRO/22/76); "Report of the United Nations Interregional Seminar on Flood Damage Prevention Measures and Management" (25 Sept.–15 Oct. 1969, Tbilisi, USSR) (ST/TAO/SER.C/144); *The Global 2000 Report . . .* (*op. cit.*), pp. 335 and *passim*; United Nations, *Integrated River Basin Development . . .*, annex II, pp. 51–55, "Correlating measures of land improvement in the drainage basin with engineering works on the stream"; Iran, Ministry of Energy, "Protection and conservation of groundwater resources in salinated areas" *Annales Juris Aquarum-II* (*op. cit.*), vol. 2, p. 412); F. Briatico, "Ecological effects of hydraulic works", *ibid.*, vol. 3, p. 1281; T. Won, "Some effects of flood control works in international rivers", *ibid.*, p. 1509; G. Posewitz, "Problemas de las lagunas costeras", *ibid.*, p. 1677.

[644] The now numerous works on ultra-hazardous activities, a problem in State responsibility, do not reach the concern responded to in this section; but see e.g. C. W. Jenks, "Liability for ultra-hazardous activities in international law", *Recueil des cours . . ., 1966–I* (Leyden, Sijthoff, 1967), vol. 117; Dupuy, *La responsabilité internationale des Etats pour les dommages d'origine technologique et industrielle*, *op. cit.* On the interrelationships generally between "land" and harmful effects, see the report of the ILA Committee on International Water Resources Law, part III, "Relationship of international water resources with other natural resources and environmental elements" (ILA, *Report of the Fifty-ninth Conference, Belgrade, 1980* (London, 1982), p. 373). Included are the two articles on "the relationship between water, other natural resources and the environment", approved by the Conference, one subparagraph of which merits quotation:

"Consistent with article IV of the Helsinki Rules, States shall ensure that:

". . .

"(*b*) the management of their natural resources (other than water) and other environmental elements located within their own boundaries does not cause substantial injury to the water resources of other States" (*ibid.*, pp. 374–375).

[645] See Cano, *Derecho, política y administración de aguas*, book III, vol. 1 (Mendoza, Argentina, Instituto Nacional de Ciencia y Técnica Hídricas, 1976), pp. 49–50, 89, 281–282, and vol. 3, 1977, pp. 1271–1272, 1339–1343, and by the same author, *Recursos hídricos . . . .*, *op. cit.*, pp. 28–29; M. Prieur, "Régimen jurídico francés de protección del medio ambiente contra las inundaciones, la erosión y la sedimentación", *Annales Juris Aquarum-II* (*op. cit.*), vol. 3, p. 1260); J. Alvarez Michelangeli, "Manejo de planicies inundables", *ibid.*, p. 1645; E. Hernández and L. Tamayo, "Aspectos metodológicos y legales de la delimitacion de areas inundables en cuencas montañosas (especialmente analizando el moderno control de torrentes en Austria)", *ibid.*, vol. 2, p. 914.

[646] *Report of the United Nations Water Conference . . .*, pp. 111–112.

emergency services, including expanding the hydrological services to aid in forecasting floods and related events.

. . .

65. To this end it is recommended that countries should:

(*a*) As part of general land and water management programmes:

(i) Provide the maximum feasible scope for flood mitigation in reservoir design and operation . . .;

(ii) Take into consideration the effect of catchment use on the amount and timing of run-off;

. . .

(*b*) Develop flood forecasting and warning systems as well as flood-fighting and evacuation measures to minimize loss of lives and property . . .;

(*c*) Improve the collection of data on damage caused by floods so as to provide a better basis for the planning, design and management of measures for the mitigation of flood loss, and to evaluate the performance of measures taken;

. . .

(*e*) Give appropriate consideration to structural measures such as dikes and levees and also to non-structural measures like flood-plain regulations, flood zoning, the preparation of flood-risk maps, flood insurance, etc. and integrate measures for upstream watershed management into overall flood control plans.

Drought loss management

66. In the recent past, droughts of exceptional severity have caused major hardships in many areas of the world. Such disasters can arise again at any time. In consequence, steps to mitigate the effects of drought in such areas is a top priority. In order to remedy the situation, structural and non-structural and emergency measures should be adopted, and for this purpose the development and management of water resources as well as drought forecasting on a long-term basis should be viewed as a key element.

. . .

68. To this end, it is recommended that countries should:

. . .

(*b*) Make an inventory of all available water resources, and formulate long-term plans for their development as an integral part of the development of other natural resources . . . These activities may require co-ordination with similar activities in neighbouring countries;

(*c*) Consider the transfer of water from areas where surplus in water resources is available to areas subjected to droughts;

(*d*) Intensify the exploration of groundwater through geophysical and hydro-geological investigations and undertake on a regional scale large-scale programmes . . .;

(*e*) Determine the effect of drought on aquifers . . .;

. . .

(*k*) Strengthen institutional arrangements . . . for the preparation and dissemination of hydrological, hydro-meteorological and agricultural forecasts and for the use of this information in the management of water resources and disaster relief;

. . .

(*m*) Evolve contingency plans to deal with emergency situations in drought-affected areas;

(*n*) Study the potential role of integration of surface and underground phases of water basins utilizing the stocks of water stored in groundwater formations in order to maintain a minimum supply under drought conditions.[647]

375. Where the watercourse is an international one, it is obvious that these, and other actions set forth in the Water Conference recommendations, need to be co-ordinated among the system States or taken jointly in order to be effective.

376. Following the lead of the debates and recommendations of the United Nations Water Conference, the aspect of drought is here added to the list of natural hazards. Although the earlier concept of "harmful effects" of water envisaged detrimental consequences from the presence or behaviour of water, this particular concern treats the other side of the coin: lack of the minimum supplies of water when normal sources fail. The required role of the law, including international water resources law, is, among other things, to anticipate these critical periods of shortage and to foster reserve supplies, contingency plans, conservation measures and interjurisdictional collaboration.[648] For many countries, effective international programmes for drought mitigation may be the most important single aspect of their relations with co-system States.[649]

377. That drought management has received the attention of States can be further demonstrated by citation of other documents and agreements. In 1973 a number of African States entered into a Convention establishing a Permanent Inter-State Committee on Drought Control in the Sahel in order, among other things:

(i) To co-ordinate all action to combat the drought and its consequences at the subregional level;

(ii) To make the international community aware of the problems caused by the drought;[650]

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[647] *Ibid.*, pp. 39–41. Principle 9 of the "draft principles of conduct in the field of the environment for the guidance of States in the conservation and harmonious utilization of natural resources shared by two or more States" of the UNEP Working Group is directed at the hazard problem:

"States have a duty urgently to inform other States which may be affected: (*a*) Of any emergency situation arising from the utilization of a shared natural resource which might cause sudden harmful effects on their environment; (*b*) Of any sudden grave natural events related to a shared natural resource which may affect the environment of such States" (para. 1), and

"States concerned should co-operate, in particular by means of agreed contingency plans, when appropriate, and mutual assistance, in order to avert grave situations, and to eliminate, reduce or correct, as far as possible, the effects of such situations or events" (para. 3) (UNEP/IG.12/2, annexed to document UNEP/GC.6/17).

[648] See Hayton, "Contingency planning and drought: legal and institutional aspects", paper prepared for the technical and scientific meetings held in Mar del Plata, Argentina, 14–25 March 1977, by the Argentine National Commission for the United Nations Water Conference; V. Yevjevich, "Outlook for long-range forecasting of droughts", *Water International* (Lausanne), vol. 6, 1981, p. 16; National Academy of Sciences, Board of Science and Technology for International Development, *More Water for Arid Lands* (Washington, D.C., 1974); E. F. Schulz, V. A. Koelzer, K. Mahmood, eds., *Floods and Droughts: Proceedings of the Second International Symposium in Hydrology*, (Fort Collins, Colo., Water Resources Publications, 1973); J. Barnea, "Men and the desert", *UNITAR News* (New York), vol. IX, 1977, pp. 35 *et seq.*

[649] The wider-ranging and perhaps permanent problem of desertification, an increasingly grave hazard in several parts of the world, was the subject of a special United Nations Conference. "Experience has shown that processes of desertification at times transcend national boundaries, making efficient regional co-operation essential in the management of shared resources . . ." (recommendation 26) (*Report of the United Nations Conference on Desertification* (Nairobi, 29 Aug.–9 Sept. 1977) (A/CONF. 74/36), chap. I, sect. V, para. 93. In the same recommendation, the Conference reaffirmed the recommendation of the United Nations Water Conference that, in the absence of bilateral or multilateral agreements, Member States should continue to apply generally accepted principles of international law in the use, development and management of shared water resources (*ibid.*, para. 94), and stated that higher priority should be given by the International Law Commission to its work on the law of the non-navigational uses of international watercourses (*ibid.*, para. 95).

[650] Art. 4 (A/9178, annex II). See also the 1905 Convention between the Netherlands and Prussia concerning the Dinkel and Vechte rivers, art. IV, sect. 2 (United Nations, *Legislative Texts* . . .,

378. The ECE Committee on Water Problems approved a recommendation to the Governments of southern European countries concerning selected water problems that pointed out the "many features" these countries have in common,

including in particular:

(*a*) Very marked seasonal and interannual fluctuations in precipitation, causing considerable variations in stream flow and in some cases floods and long periods of drought.[651]

Without using the term "drought", concern for the conservation of the supply of water in contemplation of shortage of water for irrigation has been made part of a number of treaties.[652] From Djibouti, to China, to Portugal, to the United States of America, to the United Republic of Tanzania and in many other areas, drought is a major preoccupation. The Commission's articles should include a proper provision comprehending this concern with respect to international watercourse systems. No other category of concern appears more appropriate than this one, the prevention and control of water-related hazards.

10. The proposed article

379. Considering the importance of water-related hazards to the interests of system States, the following article is proposed for the consideration of a successor Special Rapporteur and of the Commission:

Article 11. Prevention and mitigation of hazards

1. System States shall co-operate on an equitable basis with a view to the prevention or mitigation of water-related hazardous conditions and occurrences such as flood, ice accumulation, erosion, sediment transport, avulsion, saltwater intrusion, obstruction, deficient drainage and drought, as the circumstances of the particular international watercourse system warrant.

2. Without delay and by the most expeditious means available, each system State shall communicate information regarding any emergency condition or occurrence or threat thereof to any other system State affected or likely to be affected.

3. The duty set forth in paragraph 1 of this article includes, but is not limited to:

(*a*) the timely exchange of all information and data that would contribute to more effective prevention, mitigation or emergency measures with respect to water-related hazardous conditions and occurrences;

(*b*) the duty to consult concerning joint measures, structural and non-structural, where such measures might be more effective than measures undertaken by the system States individually;

(*c*) the accomplishment of studies of the efficacy of measures taken; and

(*d*) the establishment, individually or jointly, of régimes providing monitoring of conditions in international watercourse systems susceptible to hazardous occurrences and early warning to the system State or States concerned of the threat of a hazardous occurrence.

p. 755). By its resolution 8 (II) of 22 March 1974, the Governing Council of UNEP adopted proposals for future action, with observations on priority subject areas, the second listed of which was "Land, water and desertification" (*Official Records of the General Assembly, Twenty-ninth Session, Supplement No. 25* (A/9625), pp. 59–61, annex I).

For an analysis of "how to use lands exposed to natural hazards (floods, droughts, typhooons, earthquakes, volcanic eruptions, tsunamis, forest fires, locusts, etc.) and how to prevent or reduce the losses caused by such disasters", see Committee on Natural Resources, "Policy options" (E/C.7/L.53), para. 153.

[651] Sect. I, para. 2 (*a*) (ST/ECE/WATER/6/Add.1). Sect. II, para. 5 (*b*) provided for: "Appointment (or reinforcement) of adequate bodies for the whole country and for each river basin to apply policies of water quality protection, water resources management, erosion and flood control, etc.". See also I. Z. Balló, I. Orlóci and G. Reich, "Water resources development in the Tisza River Basin: past and future perspectives" (United Nations, *River Basin Development . . .*, vol. II, pp. 271–277).

[652] See e.g. art. 10 of the 1959 Agreement between Nepal and India on the Gandak irrigation and power project (United Nations, *Legislative Texts . . .*, pp. 298–299); the 1946 Treaty between Iraq and Turkey, Protocol relative to the regulation of the waters of the Tigris and Euphrates and of their tributaries, preamble, fourth para. (United Nations, *Treaty Series*, vol. 37, p. 287).

Chapter III

Introductory consideration of certain other questions

380. Although most of the relatively familiar legal issues ascribed to international watercourses have been addressed in the Special Rapporteur's first two reports and in chapter II of this third report, a number of significant aspects of the topic have not received specific attention. Some of these subtopics have entered into the discussion of other matters. It is believed that in due course these will need to be considered and developed if the Commission is eventually to present a complete set of articles on the topic. In this chapter, then, some of these special subtopics will be given a preliminary airing, along with some assaying of the merit of each as a subject of a tentative principle or rule. The following sections are submitted in a particularly provisional fashion with a view to sharing with the Commission the conceptual framework which has been developed, the direction believed sound for the Commission to follow and any proposed formulations arrived at by the time it was necessary to cease work on the topic.

A. River regulation

381. Control of the flow of an international watercourse, as with any watercourse of consequence, is a prime objective of the system States. Historically the hydraulic works and other measures taken were regarded as "river training"; more recently, "river regulation" or "river improvement" have become the more commonly used terms. The 1955 Canadian International River Improvements Act defines such improvement to mean "a dam, obstruction, canal, reservoir or other work the purpose or effect of which is (*a*) to increase, decrease or alter the natural flow of an international river, and (*b*) to interfere with, alter or affect the actual or potential use of the international

river outside Canada".[653] In the 1967 Treaty between Austria and Czechoslovakia concerning the regulation of water management questions relating to frontier waters, the expression "water management questions and measures" applies to changes in the river régime, regulation of watercourses, erection of high-water embankments, protection against flooding and ice, land reclamation and improvement, water supply, cleaning, utilization of water power, bridges and ferries and also to navigation matters related to hydraulic measures.[654]

1. Managing the supply

382. Although the means are several and the techniques may be simple or sophisticated, the notion in essence is quite straightforward: withhold surplus water by storage or diversion; release additional water when downstream availability is insufficient. Regulation, not itself a use of the waters, seeks to tame the watercourse's rampages, seasonal or otherwise; to store water for later use, such as irrigation; to maintain the flow necessary for "firm" hydro-power generation; to provide scouring and minimum flows for dilution of pollutants; to sustain navigation, timber floating and fisheries; and to protect hydraulic works and other facilities and structures such as docks and bridges. In short, well-planned regulation is almost always multipurpose, designed to satisfy "different needs and purposes, beneficial as well as protective, in an equitable manner".[655]

2. Restatement by the International Law Association

383. After several years of deliberation, the International Law Association approved nine articles on river regulation at its fifty-ninth Conference, in 1980. As the sole professional effort to present the subject in the context of general international law, as well as on the merits of the result, these articles merit quotation:

Article 1

For the purpose of these articles, "regulation" means continuing measures intended for controlling, moderating, increasing or otherwise modifying the flow of the waters in an international watercourse for any purpose; such measures may include storing, releasing and diverting of water by means such as dams, reservoirs, barrages and canals.

Article 2

Consistent with the principle of equitable utilization, basin States shall co-operate in a spirit of good faith and neighbourliness in assessing needs and possibilities and preparing plans for regulation. When appropriate, the regulation should be undertaken jointly.

Article 3

When undertaking a joint regulation, basin States should settle all matters concerning its management and administration by agreement. When necessary, a joint agency or commission should be established and authorized to manage all relevant aspects of the regulation.

Article 4

Unless otherwise agreed, each basin State party to a regulation shall bear a share of its costs proportionate to the benefits it derives from the regulation.

Article 5

1. The construction of dams, canals, reservoirs or other works and installations and the operation of such works and installations required for regulation by a basin State in the territory of another can be carried out only by agreement between the basin States concerned.

2. Unless otherwise agreed, the costs of such works and their operation should be borne by the basin States concerned.

Article 6

A basin State shall not undertake regulation that will cause other basin States substantial injury unless those States are assured the enjoyment of the beneficial uses to which they are entitled under the principle of equitable utilization.

Article 7

1. A basin State is under a duty to give the notice and information and to follow the procedure set forth in article XXIX of the Helsinki Rules.

2. When appropriate, the basin State should invite other basin States concerned to participate in the regulation.

Article 8

In the event of objection to the proposed regulation, the States concerned shall use their best endeavours with a view to reaching an agreement. If they fail to reach an agreement within a reasonable time, the States should seek a solution in accordance with chapter 6 of the Helsinki Rules.[656]

384. As formulated by the Special Rapporteur, all aspects of "substantial injury", that is, appreciable harm, have been brought together in one article;[657] the matter of prevention and settlement of disputes will be addressed in section E of this chapter. But without doubt, the engineering community views watercourse regulation as a vital part of the use, protection and control of the waters of watercourses.

3. State practice

385. Training or regulation has often been the subject

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[653] Art. 2 (*Revised Statutes of Canada, 1970* (Ottawa)), vol. IV, chap. I–22.

[654] Art. 2 (United Nations, *Treaty Series*, vol. 728, p. 354). In art. 2, para. 1, of the Canada Water Act 1969–1970, "water resource management" is defined to mean "the conservation, development and utilization of water resources, and includes . . . the *control and regulation** of water quantity and quality" (*Revised Statutes of Canada, 1970*, 1st Supplement, chap. 5). For a fairly recent use of "river training works", see art. 5 of the 1958 Agreement between Czechoslovakia and Poland concerning the use of water resources in frontier waters (United Nations, *Treaty Series*, vol. 538, p. 110).

[655] From the comment to art. 1 submitted to the International Law Association at its Belgrade Conference in 1980 by the the ILA Committee on International Water Resources Law in its second report (Chairman/Rapporteur: E. J. Manner) (ILA, *Report of the Fifty-ninth Conference, Belgrade, 1980* (London, 1982), p. 363). The question of prevention and control of floods and other hazards has been separately treated in the present report (see chap. II, sect. G, above). Prevention or mitigation of pollution by dilution has not been treated separately as a pollution control measure; see however chap. II, sect. F, above.

[656] *Ibid.*, pp. 362–369. Art. 9 notes that application of these articles "is without prejudice to the application of the relevant articles on flood control adopted by" the Association in 1972 (*ibid.*, p. 372). Each article is accompanied by commentary, and the articles were prepared and revised after consultation with technical experts. For the Committee's first report on this subject and the discussion during the 1978 Conference, see ILA, *Report of the Fifty-eighth Conference, Manila, 1978* (London, 1980), pp. 221–237 and 238–247 respectively. The revised articles, after discussion, were approved by a resolution adopted at the Belgrade Conference (ILA, *Report of the Fifty-ninth Conference* . . ., p. 4).

[657] See para. 156 above, draft article 8.

of international agreement.[658] An early treaty between Switzerland and Austria, for example, was concluded for the express purpose of regulating the Rhine between its confluence with the Ill until its entry into Lake Constance.[659] The 1922 Agreement between Denmark and Germany relating to watercourses and dikes on the German-Danish frontier contains a separate section on "Regularization of frontier watercourses".[660] The Convention of 1950 between the Soviet Union and Hungary concerning measures to prevent floods and to regulate the water régime on the Soviet-Hungarian frontier in the area of the frontier river Tisza includes these provisions:

Article 2

The contracting parties undertake to carry out works for the purpose of regulating the water systems of the Tisza river basin along the Soviet-Hungarian frontier, and to develop the existing hydraulic installations and construct new ones in order to protect their territories against floods . . .

Article 3

All planning and survey work necessary for the execution of the measures provided for in article 2 of this Convention shall be carried out by each party in its own territory, . . . in accordance with programmes agreed between the contracting parties.

. . .

Article 6

The contracting parties undertake to exchange all data in their possession which are necessary for technical planning and for carrying out survey work.

Article 7

The contracting parties pledge themselves to maintain the operation of the water control system (of rivers, canals, and hydraulic installations) in good order . . .

Article 8

Should either contracting party wish to entrust to the other party the execution of the works referred to in articles 2 and 3 of this Convention, the commission shall be registered in official form, the other contracting party's consent having been obtained, through the signature of a protocol concerning the execution and cost of the works and the procedure for the reimbursement of expenses . . .[661]

386. The express purpose of the construction and administration of the Owen Falls dam in Uganda was "control of the waters of the Nile", as well as production of hydro-electric power.[662] Annex E of the 1960 Indus Waters Treaty between India and Pakistan deals in detail with India's storage of waters on the western rivers. The requirements for storage for various purposes—for example, dead storage, flood storage, conservation storage and power storage—are described and provided for.[663] The Treaty of the River Plate Basin of 1969 commits the parties, Argentina, Bolivia, Brazil, Paraguay and Uruguay, to join forces for, among other things, the advancement of "the rational utilization of water resources in particular by the regulation of watercourses and their multipurpose and equitable development";[664] Mexico and the United

[658] In chap. II, sect. G, above, entitled "Prevention and control of water-related hazards", most of the examples cited relate to watercourse regulation measures for the prevention or mitigation of hazards. The 1923 Geneva Convention relating to the development of hydraulic power affecting more than one State included, in a list of points that might appropriately be taken up in specific agreements on hydro-power works, regulation of water flow (art. 6, para. (*f*)) (League of Nations, *Treaty Series*, vol. XXXVI, p. 75); see also art. 10, especially paras. 2 and 3, of the Statute on the régime of navigable waterways of international concern accompanying the Convention on the same subject signed at Barcelona on 20 April 1921 (*ibid.*, vol. VII, p. 57).

[659] Signed at Vienna, 30 Dec. 1892 (United Nations, *Legislative Texts and Treaty Provisions concerning the Utilization of International Rivers for other Purposes than Navigation* (Sales No. 63.V.4), pp. 489–494). See also, *inter alia*, the 1931 Treaty between Austria and Liechtenstein regarding the regulation of the Rhine and tributary waters (*ibid.*, pp. 486–488); the 1951 Convention between Switzerland and Italy concerning the correction of the Roggia Molinara (*ibid.*, pp. 850–851); the 1913 Convention between France and Switzerland for the development of the water-power of the Rhone, especially art. 4 (*ibid.*, p. 709); the 1955 Agreement between Yugoslavia and Romania concerning questions of water control on water control systems and watercourses on or intersected by the frontier, especially art. 2 (*ibid.*, p. 929).

[660] Sect. C (see especially arts. 15–28) (*ibid.*, pp. 583–587).

[661] *Ibid.*, pp. 827–828. See also, for example, the 1928 Treaty between Austria and Czechoslovakia regarding the settlement of legal questions connected with the frontier, especially art. 29 (League of Nations, *Treaty Series*, vol. CVIII, p. 71); annex B, entitled "Regulation of streams and resultant future changes in the course of the frontier . . ." of the 1960 Frontier Treaty between the Netherlands and the Federal Republic of Germany (United Nations, *Treaty Series*, vol. 508, pp. 254–258); the 1955 Convention between Italy and Switzerland concerning the regulation of Lake Lugano (*ibid.*, vol. 291, p. 213); the 1959 Agreement between Finland, Norway and Soviet Union concerning the regulation of Lake Inari (*ibid.*, vol. 346, p. 192); art. 1 of the 1957 Agreement extending the provisions of the Romanian-Soviet Convention of 1952 concerning measures to prevent floods and to regulate the water régime of the River Prut to the rivers Tisza, Suceava and Siret and their tributaries and to the irrigation and drainage canals forming or intersecting the Romanian-Soviet frontier (*Yearbook . . . 1974*, vol. II (Part Two), p. 303, document A/CN.4/274, para. 156); the 1963 Protocol between Greece and Turkey concerning the final elimination of differences concerning the execution of hydraulic operations for the improvement of the bed of the River Meriç-Evros, especially art. 20 (*ibid.*, p. 309, para. 209); the 1954 Agreement between Hungary and Czechoslovakia on the settlement of technical and economic questions concerning frontier watercourses, especially arts. 2–7, 10, 18 (United Nations, *Treaty Series*, vol. 504, pp. 256–264); preamble and arts. 4 and 5 of Protocol No. 1, relative to the regulation of the waters of the Tigris and Euphrates and of their tributaries, to the 1946 Treaty between Iraq and Turkey (*ibid.*, vol. 37, pp. 287–290).

[662] Exchange of notes of 30 and 31 May 1949 constituting an Agreement between the United Kingdom and Egypt (*ibid.*, vol. 226, p. 274). For the upper reaches of the Nile, the Governments of Egypt, Kenya, Sudan, Uganda and the United Republic of Tanzania initiated in 1967, with the assistance of UNDP and WMO, the hydrometeorological survey project that now covers Lakes Victoria, Kyoga and Mobutu Sese Seko, together with the upper reaches of the White Nile. The aim is to study the water balance of this "coupled system" in order to permit planning of water conservation and to provide ground work for the intergovernmental co-operation with a view to full utilization of the Nile in the mutual interests of the participating countries. Control and regulation of the Lakes-Nile system would yield several advantages. In 1971 Ethiopia joined the Technical Committee, set up to manage the project, as an observer. Rwanda and Burundi became members in 1972, and Zaire in 1977, expanding the scope of the co-operation and the coverage. See "The hydrometeorological survey project" by A. B. Abul Hoda, Project Director, paper prepared for the United Nations Interregional Meeting of International River Organizations, Dakar, Senegal, 5–14 May 1981 (United Nations, *Experiences in the Development and Management of International River and Lake Basins*, Natural Resources/Water Series No. 10 (Sales No. E.82.A.17), p. 398).

[663] United Nations, *Treaty Series*, vol. 419, p. 186. See also the 1959 Agreement between the United Arab Republic and Sudan for the full utilization of the Nile waters, especially art. 2, "The Nile control projects and the division of their benefits between the two Republics" (*ibid.*, vol. 453, pp. 66–68).

[664] Art. 1, subpara. (*b*) (*ibid.*, vol. 875, p. 11). See also art. I of the 1973 Agreement between Paraguay and Argentina on the establishment of the Yacyretá enterprise (*Derecho de la integración* (Buenos Aires), vol. VII, No. 15, 1974, p. 211).

States agreed in 1944 to construct dams and other works jointly in the Rio Grande (Rio Bravo) for the purposes of conservation, storage and regulation of the flow "in a way to ensure the continuance of existing uses and the development of the greatest number of feasible projects . . ."[665]

387. As a final example, the 1971 Agreement between Finland and Sweden concerning frontier rivers has "Special provisions concerning water regulation".[666] Regulation of "the flow of water from a lake or in a watercourse" is for the purpose of achieving "better water management with a view to promoting traffic, timber floating, the use of water power, agriculture, forestry, fishing, water supply, water conservancy or any other significant public interest."[667] The parties' Frontier River Commission must issue rules governing participation in a regulation project which involves two or more interested parties.[668] Where industrial, power or other enterprises benefit from the regulation project without participating in it, the Frontier River Commission may require payment of compensation to the project "representing a reasonable share of the costs of regulation".[669]

4. Distinguishing "regulation" from anti-hazard measures

388. Thus while measures directed at water-related hazards have a "negative" control or prevention approach, the concept of watercourse regulation is much broader, embracing in addition the planned facilitation of uses and even of waste elimination by management of the flow of the waters in the system. Equally significantly, regulation is not aimed at enjoining changes in the régime of the watercourse. On the contrary, it envisages active intervention for the purpose of attaining improved and more reliable benefits from the waters, delivered to the places and at the times needed. River "training" is seen as the fundamental means of reconciling conflicting, and periodically changing, demands by augmenting or by diminishing supplies to meet diverse requirements and also contributing to the avoidance and mitigation of water's "harmful effects". River regulation is, in brief, the hydraulic engineer's scheme for rational optimum utilization.

5. The proposed article

389. For the Commission to take account of this virtually universal dimension of co-operation with respect to international watercourse systems, a succinct article may be sufficient. The following draft language may be useful as a basis for discussion:[670]

Article 12. Regulation of international watercourses

1. System States shall co-operate in the ascertainment of the needs and opportunities for regulation of their international watercourse.

2. Consistent with the principle of equitable participation, system States shall undertake and maintain, individually or jointly, those regulation works and measures regarding which agreement has been reached among the system States concerned, including with respect to the defrayal of costs.

3. "Regulation", for the purposes of this article, means the use of hydraulic works or any other continuing measure to alter or vary the flow of the waters in an international watercourse system for any beneficial purpose.

B. Hydraulic installations and water security

390. Questions of public safety with respect to the possible failure, mismanagement or sabotage of major hydraulic works and of the security of the installations themselves are not novel. The collapse of a high storage dam, for example, may take thousands of lives as well as have devastating economic and financial consequences. As more elaborate and much more costly multipurpose projects have been constructed, especially in recent decades, concern has heightened. In addition to the potential for catastrophe posed by intensified occupation and use of low-lying areas downstream, the vulnerability of such works to acts of terrorism has led, or should have led, waterworks administrators to enhance their security precautions and to review their emergency operating procedures.

1. The international problem

391. Where important hydraulic works are erected or operate even in the territory of one State on an international watercourse system, sensitivity is usually not confined to that one system State. Downstream system States in particular have traditionally expressed concern for construction standards and operating schemes, especially during crisis situations. The need to be assured that adequate security measures are in effect to forestall or repel attack by terrorists or insurgents is of more recent inception, and the sufficiency of previous security arrangements may be questioned in these days by the system State or States concerned, including a system State in whose territory the hydraulic work is located. The problem could become profoundly serious.

392. System States have a legitimate interest in the safety and security of water-related installations, and not simply because of their potential for death and destruction. More and more major projects are part of a regional or system-wide plan for development, control and environmental protection, with benefits and costs, direct and indirect, to each participating system State. In their consultations and their sharing of information and data, system States will increasingly include questions of installation security and water safety, as well as the more familiar concern for safe construction and operation.

2. Protection in times of armed conflict

393. One important aspect of hydraulic safety and

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[665] Art. 5, sect. I, of the Treaty relating to the utilization of the waters of the Colorado and Tijuana rivers and of the Rio Grande (Rio Bravo) (United Nations, *Treaty Series*, vol. 3, p. 324). See also art. 5, sect. II, and arts. 6–8; *re* the Colorado, art. 12; *re* the Tijuana, art. 16, para. 2 (*ibid.*, pp. 324–350).

[666] Chap. 4 (*ibid.*, vol. 825, p. 292).

[667] Chap. 4, art. 1 (*ibid.*).

[668] Chap. 4, art. 3 (*ibid.*).

[669] Chap. 4, art. 4 (*ibid.*, pp. 292–294).

[670] Although this article includes a definition, it is presumed that in due course the Commission will collect all definitions in one article.

security has received special scrutiny. It is the area of greatest pertinent development in international law: the protection of hydraulic works and water resources during armed conflict, international and non-international.

394. On the initiative of the International Committee of the Red Cross, and convoked by the Swiss Government, sessions of the Diplomatic Conference on Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflict took place in Geneva from 1974 to 1977. In June 1977, the Conference adopted by consensus two protocols which have, in part, direct relevance to international watercourses. Protocol I to the Geneva Conventions applies to international armed conflict and contains, in chapter III (Civilian objects) of part IV (Civilian population), an article on "Protection of objects indispensable to the survival of the civilian population", which provides in part:

2. It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas . . , crops, livestock, *drinking water installations and supplies and irrigation works*,* for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive.

. . .

4. These objects shall not be made the object of reprisals.[671]

395. Another pertinent article is entitled "Protection of works and installations containing dangerous forces", and provides as follows:

1. Works or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population. Other military objectives located at or in the vicinity of these works or installations shall not be made the object of attack if such attack may cause the release of dangerous forces from the works or installations

. . .

2. The special protection against attack provided by paragraph 1 shall cease:

(*a*) For a dam or a dyke only if it is used for other than its normal function and in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support;

(*b*) For a nuclear electrical generating station only if it provides electric power in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support;

. . .

4. It is prohibited to make any of the works, installations or military objectives mentioned in paragraph 1 the object of reprisals.

5. The parties to the conflict shall endeavour to avoid locating any military objectives in the vicinity of the works or installations mentioned in paragraph 1. Nevertheless, installations erected for the sole purpose of defending the protected works or installations from attack are permissible and shall not themselves be made the object of attack, provided that they are not used in hostilities except for defensive actions . . . and that their armament is limited to weapons capable only of repelling hostile action against the protected works or installations.

6. The high contracting parties and the parties to the conflict are urged to conclude further agreements among themselves to provide additional protection for objects containing dangerous forces.

7. In order to facilitate the identification of the objects protected by this article, the parties to the conflict may mark them with a special sign consisting of a group of three bright orange circles placed on the same axis, as specified in article 16 of annex I to this Protocol . . .[672]

396. The following article stipulates that "constant care shall be taken to spare . . . civilian objects",[673] those who plan or decide upon an attack shall "take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, . . . damage to civilian objects".[674] Moreover, "effective advance warning shall be given of attacks which may affect the civilian population, unless circumstances do not permit".[675]

397. The Protocol also requires parties to the conflict to take "necessary precautions to protect . . . civilian objects under their control against the dangers resulting from military operations".[676] Also provided is the authority of a party to declare a locality to be non-defended: "It is prohibited for the parties to the conflict to attack, by any means whatsoever, non-defended localities."[677] By agreement, in peacetime or after the outbreak of hostilities, the parties to a conflict may confer the status of "demilitarized zone"; it is "prohibited for the parties . . . to extend their military operations to" such zones contrary to the terms of the agreement.[678]

398. Protocol II to the Geneva Conventions relates to the protection of victims of non-international armed conflicts.[679] Two articles, similar in purport to articles 54 and 56 of Procotol I, read as follows:

Article 14—*Protection of objects indispensable to the survival of the civilian population*

Starvation of civilians as a method of combat is prohibited. It is therefore prohibited to attack, destroy, remove or render useless, for that purpose, objects indispensable to the survival of the civilian population such as foodstuffs, agricultural areas . . ., crops, livestock, *drinking water installations and supplies and irrigation works.**

Article 15—Protection of works and installations containing dangerous forces

Works or installations containing dangerous forces, namely, dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population.[680]

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[671] Art. 54, Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I) (United Nations, *Juridical Yearbook 1977* (Sales No. E.79.V.1), p. 115. Art. 55, para. 1, requires that care shall be taken "to protect the natural environment against widespread, long-term and severe damage".

[672] Art. 56 (*ibid.*, pp. 115–116).

[673] Art. 57, para. 1 (*ibid.*, p. 116).

[674] Art. 57, para. 2 (*a*) (ii) (*ibid*).

[675] Art. 57, para. 2 (*c*) (*ibid.*, p. 117).

[676] Art. 58, para. (*c*) (*ibid.*).

[677] Art. 59, para. 1 (*ibid.*).

[678] Art. 60, paras. 2 and 1 (*ibid.*, p. 118).

[679] Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of non-international conflicts (Protocol II) (*ibid.*, p. 135). Excluded, however, are "situations of internal disturbances and tensions, such as riots, isolated and sporadic acts of violence and other acts of a similar nature, as not being armed conflicts". (art. 1, para. 2).

[680] *Ibid.*, p. 140. For a description and analysis of the conference diplomacy behind Protocol II, see D. Forsythe, "Legal management of internal war: the 1977 Protocol on Non-International Armed Conflicts", *American Journal of International Law*, vol. 72, 1978, especially pp. 277–295 and works and documents there cited.

399. Any provision in the Commission's articles concerning the protection of water resources and hydraulic installations must be drawn up to take full account of these progressive provisions and to avoid, insofar as possible, any entanglement in the larger questions of the "Law of war". Without doubt, unqualified general language of proscription would run the risk of embroiling this topic in considerations and controversy far afield from the purpose at hand. Nonetheless, the extreme gravity of the potential harm, including in some cases calamitous losses, from the wrecking of modern major hydraulic works—plus the patent unacceptability of lethal contamination of water supplies—renders this particular problem ripe for codification. Governments of system States are, on humanitarian and economic grounds, constrained to use their best efforts to protect their peoples and their economies from ruin. Water, and water-related installations, are vital. And credible threats to cause such poisoning or damage, holding whole countries or regions in a sense hostage, could become increasingly feasible unless security programmes are equal to the tasks of protection. In any event, since special rules for the protection of hydraulic installations have only recently been brought to the fore, an effort should be made to arrive at applicable legal principles on that aspect acceptable in and applied by the international community. The Protocols to the Geneva Conventions, when they come into force among the States most concerned, will go far towards meeting the problem. But as suggested below, there may perhaps be room for a relevant contribution by these draft articles.

3. History of concern for water safety

400. In most treatises on the law of land warfare, water enters quite incidentally, in relation to water supplies. The 16th century jurist Alberico Gentili found the rule against the poisoning of wells and springs already an established part of international law.[681] In 1646, Grotius described the point in this way:

Ceterum non idem statuendum de aquis sine veneno ita corrumpendis ut bibi nequeant . . . Id enim perinde habetur quasi avertatur flumen aut fontis venae intercipiantur, quod et natura et consensu licitum est.[682]

Similarly, Vattel later reported:

There is an even more general agreement in condemning the poisoning of streams, springs and wells. Certain authors give as a reason that thereby innocent persons, who are not our enemies, may be killed. . . . But while the use of poison is forbidden, it is perfectly lawful to turn aside a stream, to cut it off at its source, or in any other way to render it useless, in order to force the enemy to surrender.[683]

401. In the early twentieth century, Fauchille maintained:

The use of poison in any form, whether to contaminate wells or food or to envenom weapons, is strictly prohibited in modern warfare . . . However, it is permissible to perforate dikes, to demolish sluice gates. One may also divert the course of a river, cut off the enemy's sources of water. Once deprived of an element so essential to the survival of both men and animals, the enemy will surely be forced to abandon his positions.[684]

Oppenheim, discussing the prohibitions in article 23 of the Regulations annexed to Convention IV, respecting the laws and customs of war on land, signed at The Hague in 1907, concludes: "wells, pumps, rivers, and the like from which the enemy draws drinking water must not be poisoned".[685] Also, "an armed force besieging a town may . . . cut off the river which supplies drinking water to the besieged, but must not poison the river".[686]

402. Ancillary to the provision concerning the use of weapons or material "calculated to cause unnecessary suffering" (article 23 (*e*) of the Regulations annexed to The Hague Convention IV of 1907), the field manual on the law of land warfare of 1956 of the United States army states: "The foregoing rule does not prohibit measures being taken to dry up springs, to divert rivers and aqueducts from their courses . . ."[687] But in a list of acts "representative of violations of the law of war ('war crimes')", the same manual cites "poisoning of wells or streams".[688]

The corresponding British manual provides:

Water in wells, pumps, pipes, reservoirs, lakes, rivers and the like, from which the enemy may draw drinking water, must not be poisoned or contaminated. The poisoning or contamination of water is not made lawful by posting up a notice informing the enemy that the water has been thus polluted.[689]

403. Incidents in recent years have focused public attention on the vulnerability of water, as such, to deliberate poisoning. Such poisoning can result from

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[681] A. Gentili, *De jure belli, libri tres* (1612). See *The Classics of International Law* (Oxford, Clarendon Press, 1933), vol. I (facsimile of original) and vol. II (English trans.). However, Michel d'Amboise had earlier asserted (1543), in *Le guidon des gens de guerre*, that it was legally permissible to "gaster, infester, intoxiquer et empoisonner les eaues des ennemys".

[682] H. Grotius, *De jure belli ac pacis, libri tres* (1646). See *The Classics of International Law* (Oxford, Clarendon Press, 1913), vol. I.

[683] E. de Vattel, *The Law of Nations or the Principles of Natural Law applied to the Conduct and to the Affairs of Nations and of Sovereigns* (1758). See *The Classics of International Law* (Washington, D.C., Carnegie Institution of Washington, 1916), vol. 3, p. 289.

[684] P. Fauchille, *Traité de droit international public*, 8th ed., rev. of *Manuel de droit international public* by H. Bonfils (Paris, Rousseau, 1921), vol. II, p. 123. In the same vein, see A. Mérignhac, *Le droit des gens et la guerre de 1914–1918* (Paris, Sirey, 1921), vol. I, p. 164. Most of the early citations in this section are taken from the report of the ILA Committee on International Water Resources Law, part III, "Intermediate report on the protection of water resources and water installations in times of armed conflict" (Rapporteur: F. J. Berber) (ILA, *Report of the Fifty-sixth Conference, New Delhi, 1974* (London, 1976), p. 129).

[685] L. Oppenheim, *International Law: A Treatise*, 7th edition, H. Lauterpacht, ed. (London, Longmans, Green, 1952), vol. 2: *Disputes, War and Neutrality*, p. 340, sect. 110.

[686] *Ibid.*, p. 419, sect. 157.

[687] Para. 37(*b*). Quoted in M. M. Whiteman, *Digest of International Law* (Washington, D.C., U.S. Government Printing Office) vol. 10, p. 455.

[688] Para. 504 (*i*).

[689] United Kingdom, War Office, *The Law of War on Land, Being Part III of the Manual of Military Law* (1958), p. 42, quoted in Whiteman, *op. cit.*, p. 458. As one of the "examples of punishable violations of the laws of war, or war crimes", the same manual lists "poisoning of wells, streams, and other sources of water supply" (para. 626 (*i*)). The report of the ILA Committee on International Water Resources Law contains the following statement: "Because of the interrelation of all water, the prohibition of poisoning or making drinking water useless for human consumption by other means would also apply to rivers, lakes and canals, especially irrigation canals . . ." (ILA, *Report of the Fifty-sixth Conference*, . . ., p. 138). On the questions of poisoning water intended only for animal consumption and whether water supplies may legally be cut off, or rivers diverted from their courses, *ibid.*, pp. 138–139. For a discussion of the deliberate causing of floods by the opening of spillway gates, etc., as distinct from the destruction of dams and dikes for "the necessities of war" (Regulations annexed to The Hague Convention IV, art. 23 (*g*)), and striking illustrations of destruction of water systems and the civilizations they sustained, see ILA, *Report of the Fifty-sixth Conference*, . . ., pp. 140–141.

the introduction of highly toxic chemicals or infectious biological agents (or their toxins); moreover, a damaged or malfunctioning nuclear reactor may release dangerously radioactive matter. Sophistication in toxicology is essential in the planning of avoidance of such contaminations as well as in neutralizing and cleansing operations.

404. Where a water supply from an international watercourse could be perniciously polluted with consequences in another system State, the system States concerned would do well to assure themselves of sufficient safeguards to avert such noxious contaminations. This is clearly not a matter of pollution in the ordinary sense. Special measures are called for and responsibilities need to be defined; the costs of such measures may be allocated by agreement on an equitable basis. However, a system State is not, generally speaking, an insurer against such poisoning. Due diligence would appear to be the normal measure of responsibility in such cases, as with other acts of sabotage or terrorism.

4. Consideration by the International Law Association

405. The Committee on International Water Resources law of the International Law Association included this subject in its Rapporteur's extensive "Intermediate report" for discussion at the Association's New Delhi Conference in 1974.[690] It submitted:

> It is only in the last decade that the new awareness of the world-wide threat to human environment has meant a turning point also in the considerations concerning the protection of water and water installations in times of armed conflict, although these considerations are still far from being materially comprehensive or methodically systematic.
>
> . . .
>
> The dangers menacing dams and consequently the civil population living in the potential flood area of such dams have been visualized by a number of Governments and have led to municipal legislation providing for special protection, notably in Switzerland, Sweden and Germany.[691]

406. The report points out further the importance of safeguarding water supplies to the parties when, as the result of fixing a new boundary, "the hydraulic system (canalization, inundations, irrigations, drainage, or similar matters) in a State is dependent on works executed within the territory of another State".[692]

407. The Committee proposed to the 1976 Conference of the International Law Association its articles on "the protection of water resources and water installations in times of armed conflict", which were approved by the Conference and read as follows:

Resolution

Recalling the significant increase, during recent decades, in the demand for water and the consequent development of water installations;

Being aware of the destructive power of modern weapons;

Taking into account the vital importance of water and water installations for the health and even the survival of people all over the world and the susceptibility of water and water installations to damage and destruction;

Considering the lack of specific rules of international law for the protection of water and water installations against damage or destruction in times of armed conflict;

Convinced of the urgent need to establish precise rules for the protection of water and water installations against damage or destruction and thus to contribute to the development of international humanitarian law applicable to armed conflicts;

Adopts the following articles as guidelines for the elaboration of such rules:

Article I

Water which is indispensable for the health and survival of the civilian population should not be poisoned or rendered otherwise unfit for human consumption.

Article II

Water supply installations which are indispensable for the minimum conditions of survival of the civilian population should not be cut off or destroyed.

Article III

The diversion of waters for military purposes should be prohibited when it would cause disproportionate suffering to the civilian population or substantial damage to the ecological balance of the area concerned. A diversion that is carried out in order to damage or destroy the minimum conditions of survival of the civilian population or the basic ecological balance of the area concerned or in order to terrorize the population should be prohibited in any case.

Article IV

The destruction of water installations such as dams and dikes which contain dangerous forces, should be prohibited when such destruction might involve grave dangers to the civilian population or substantial damage to the basic ecological balance.

Article V

The causing of floods as well as any other interference with the hydrologic balance by means not mentioned in articles II to IV should be prohibited when it involves grave dangers to the civilian population or substantial damage to the ecological balance of the area concerned.

Article VI

1. The prohibitions contained in articles I to V above should be applied also in occupied enemy territories.

2. The occupying power should administer enemy property according to the indispensable requirements of the hydrologic balance.

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[690] *Ibid.*, p. 129. The report does not cover "a mere state of international tension, nor does it intend to examine the problems of the protection of water and water installations in cases of natural catastrophe which might well be the object of a special study", nor did it include "problems raised by so-called terrorist activities . . ." (*ibid.*, p. 134).

[691] *Ibid.*, p. 136. The report cites, *inter alia*, a proposal submitted by experts from Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary and Poland at the second session, in 1972, of the Conference of Government Experts on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts: "It is forbidden to use means and methods which destroy the natural human environmental conditions" (draft art. 30, para. 4) (International Committee of the Red Cross, *Report on the Work of the Conference*, vol. II, *Annexes* (Geneva, 1972), p. 63).

[692] ILA, *Report of the Fifty-sixth Conference*, . . ., p. 142, quoting from the Treaty of Saint-Germain with Austria of 1919 (art. 309), of Trianon with Hungary of 1920 (art. 292), of Sèvres with Turkey of 1920 (art. 363) and of Lausanne with Turkey of 1923 (art. 109), and citing similar provisions in the 1947 Peace Treaty between the Allied and Associated Powers and Italy (art. 9 and annex III, and art. 13 and annex V). The report also refers to the nearly 13 years of "dangerous controversy ended only in 1960 by the Indus Waters Treaty", as the consequence of what it maintains was "a frontier delimitation unaware of the priority of a reasonable regulation of water supplies" (*ibid.*, p. 151, footnote 20). On the problem of the continued validity of water treaties in times of international conflict", see sect. IV of the report (*ibid.*, pp. 142–145).

3. In occupied territories, seizure, destruction or intentional damage to water installations should be prohibited when their integral maintenance and effectiveness would be vital to the health and survival of the civilian population.

Article VII

The effect of the outbreak of war on the validity of treaties or of parts thereof concerning the use of water resources should not be termination but only suspension. Such suspension should take place only when the purpose of the war or military necessity imperatively demand the suspension and when the minimum requirements of subsistence for the civil population are safeguarded.

Article VIII

1. It should be prohibited to deprive, by the provisions of a peace treaty or similar instrument, a people of its water resources to such an extent that a threat to the health or to the economic or physical conditions of survival is created.

2. When, as the result of the fixing of a new frontier, the hydraulic system in the territory of one State is dependent on works established in the territory of another State, arrangements should be made for the safeguarding of uninterrupted delivery of water supplies indispensable for the vital needs of the people.[693]

Useful as the foregoing ILA resolution is, it is believed that the draft article or articles of the International Law Commission on this aspect should not be limited to situations of armed conflict.[694]

5. Water resources: treaty practice and security

408. A number of international agreements dealing with water resources include express provision for hydraulic installation security and public safety, and some other treaties may have taken such considerations to be an unspoken underlying premise. The drafters of and signatories to the 1923 Geneva Convention relating to the development of hydraulic power affecting more than one State were "safety conscious", as a reading of article 6 reveals:

The agreement contemplated in the foregoing articles may provide, amongst other things, for:

(*a*) General conditions for the establishment, upkeep and operation of the works;

(*b*) Equitable contributions by the States concerned towards the expenses, risks, damage and charges of every kind incurred as a result of the construction and operation of the works, as well as for meeting the cost of upkeep:

. . .

(*d*) The methods for exercising technical control and securing public safety;

(*e*) The protection of sites;

(*f*) The regulation of the flow of water;

(*g*) The protection of the interests of third parties; . . .[695]

409. With respect to the construction and operation of the Emosson hydroelectric project, France and Switzerland required the Governments' approval of the designs and layout of the works as prepared by the concessionaire; concerning installation security, the works are subjected to the national law of the party in which the particular installations are situated.[696] Switzerland also has an agreement with Italy governing the construction and operation of a dam and a reservoir near the junction of the Spöl and Ova dal Gall. Maximum safety for Switzerland is required in connection with the dam's specifications; adequate water outlets, so that flood waters may be released freely at all times, is specially stipulated.[697]

410. The "safety" originally contemplated in the treaties may have been, primarily at least, protection against the hazards and harmful effects taken up as a separate aspect earlier in this report (chap. II, sect. G).[698] In this section, it is above all protection against wilful actions that is the object of study and possible regulation.

6. Terrorist acts of sabotage

411. Besides destructive or contaminating action taken during armed conflict, acts of sabotage by terrorists are more than ever before of prime concern. However, there is little published record of concerted international action. Individual system State practice, certainly, is intensive or indubitably should be; Governments are presumably fully conscious of the risks at stake, though consultation and collaboration among system States appears underdeveloped.

412. Lacking generally is authoritative articulation of general principles of co-operation in the fields of public safety and security of water installations, as is expression of the extent of a system State's possible responsibility for failure to use its best efforts to keep this kind of harm from happening. Responsibility of a system

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[693] ILA, *Report of the Fifty-seventh Conference, Madrid, 1976* (London, 1978), pp. xxxv–xxxvi.

[694] In adopting its resolution approving the proposed rules, the International Law Association stated that this was "with the understanding that these rules should be applied also with respect to other conduct intended to damage or destroy the water resources of a State or area . . ." (*ibid.*, p. xxxiv).

[695] League of Nations, *Treaty Series*, vol. XXXVI, p. 83.

[696] Art. 2 of the 1963 Convention on the Emosson hydroelectric project between France and Switzerland (*Revue générale de droit international public* (Paris), 3rd series, vol. XXXVI, No. 1, 1965 p. 571; see also *Yearbook . . . 1974*, vol. II (Part Two), p. 311, document A/CN.4/274, para. 229). It can be said on good authority that the security precautions for these works, now in operation, are taken seriously. Under art. 3 of the Convention, the concessionaire is obliged to safeguard general interests by operating spillways and drains so that proper flows are maintained; under art. 4 a permanent supervisory commission was also established. See also the 1975 Treaty between Iran and Iraq on international borders and good neighbourly relations, and the Protocol on border security, especially arts. 1, 6 and 9 (*re* sabotage, subversion and safeguarding the security of joint water borders in Shatt-ul-Arab) (*International Legal Materials*, vol. XIV, No. 5, 1975, pp. 1133–1135).

[697] Art. 8 of the 1957 Convention concerning the use of water-power of the Spöl (United Nations, *Legislative Texts . . .*, p. 862).

[698] See e.g. the 1913 Convention between France and Switzerland for the development of the water-power of the Rhone, arts. 1–4 (*ibid.*, p. 709); the 1950 State Treaty between Luxembourg and the Rhineland-Palatinate concerning the construction of a hydroelectric power plant on the Saure (Sûre), arts. 5–6, 8–9, 20–21 (*ibid.*, pp. 722–726). Navigation treaties traditionally deal with the responsibility of the riparian State to maintain, if not improve, the safety of navigation. See R. R. Baxter, *The Law of International Waterways* (Cambridge, Mass., Harvard University Press, 1964); H. Zurbrügg, *Das internationale Flusschiffahrtsrecht und die Schweiz* (Basel, 1945); report of the ILA Committee on International Water Resources Law, part two, "Report on maintenance and improvement of naturally navigable waterways separating or traversing several States" (Rapporteur: H. Zurbrügg) (ILA, *Report of the Fifty-sixth Conference . . .* especially pp. 123–125, and works and examples there cited). Ultimately, however, the elements dealt with in discrete articles for the purposes of international legal formulations merge in practice into a co-ordinated pattern of co-operation, if not joint action; a communications system, for example, set up to transmit early warnings in the case of the threat or occurrence of natural and accidental hazardous events, can serve equally to inform co-system States of acts of sabotage, etc.; installation security and public safety can be made agenda items during regular or special consultations.

State normally would be not for the fact of poisoning or damage to an installation, but for failure to fulfil a special duty to use diligence and foresight to ward off the person or persons, even including in some cases insurgents or foreign military; a separate duty, absolute unless excused, would of course apply to the system State's own actions of this kind of wilful nature. There might also be absolute liability attaching to certain types of installations, notably nuclear installations.

413. Acts of terrorists against water and hydraulic installations have been given, publicly, little methodical attention at the intergovernmental level. The matter belongs to the wide, evolving field of lawful measures countering terrorism.[699] It is not recommended that the Commission, through the topic on the law of the non-navigational uses of international watercourses, become involved in the controversial phases of the contemporary debate on terrorism.

414. Indeed, some of the proposals earlier in this century appear to have taken a broader view of terrorist acts than is commonly seen today. Among the acts deemed to be terrorism, as studied by the International Conferences on the Unification of Penal Law,[700] were, in express terms: flooding; the damaging of public utilities; the pollution, fouling or deliberate poisoning of drinking water; causing or propagating contagious or epidemic diseases; and any wilful act endangering lives and the community.[701]

7. The proposed article

415. In a preliminary fashion, in the light of the compelling considerations and limited precedent marshalled above, these paragraphs of a draft article, restricted to shared water resources and associated installations, are offered for the consideration of a successor Special Rapporteur and of the Commission:

Article 13. Water resources and installation safety

1. System States shall employ their best efforts to prevent the poisoning of shared water resources by any and all persons or from any source.

2. Hydraulic installations and other facilities, associated with an international watercourse system and capable of releasing dangerous forces or substances, shall not be attacked, destroyed or damaged during peacetime, or in time of armed conflict unless such installations or facilities are demonstrably being used as part of an adversary's offensive military positions or apparatus.

3. Hydraulic installations and other facilities, associated with an international watercourse system and capable of releasing dangerous forces or substances, shall not be used in preparation for, or in the conduct of, offensive military operations.

4. System States shall, at the request of any of them, consult with a view to reaching agreement with respect to sufficient practicable security and safety measures, individual and joint, for the protection of shared water resources from poisoning and of hydraulic and other installations and facilities associated with their international watercourse system from terrorist acts of sabotage.

5. Without prejudice to the question of the effect otherwise of the outbreak of hostilities upon the status of any system agreements or other water-related treaties or arrangements, system States shall, to the extent possible, by direct or indirect means, sustain during times of armed conflict warning systems established with other system States for the purpose of informing a system State or States of the threat or occurrence of a water-related hazardous event.

6. Witholding, by diversion or other means, of water from a system State so as to place in jeopardy the survival of the civilian population or to imperil the viability of the environment is prohibited in peacetime and in time of armed conflict.

8. Correspondence of the proposed article 13 with the 1977 Geneva Protocols

416. The proposed article, although applicable only to the works and waters of international watercourses, is drawn in large part from relevant articles of the two Additional Protocols to the Geneva Conventions dealing with "international humanitarian law" quoted earlier in this section. Although the proposed article is essentially consonant with those Protocols, only a few of the many provisions of the Protocols apply;[702]

[699] From a burgeoning literature, see e.g. F. and B. Lockwood, Jr., "Preliminary thoughts towards an international convention on terrorism", *American Journal of International Law*, vol. 68, 1974, p. 69, and works and documents there cited; J. Dugard, "Towards the definition of international terrorism" (American Society of International Law, *Proceedings of the 67th Annual Meeting* (Washington, D.C., 1973)), p. 94; discussion and interim report of the ILA Committee on International Terrorism (Chairman/Rapporteur: A. Evans) submitted to the Association at its New Delhi Conference in 1974 (ILA, *Report of the Fifty-sixth Conference* . . ., pp. 155–177), and discussion and second interim report of the Committee submitted to the Madrid Conference in 1976 (ILA, *Report of the Fifty-seventh Conference* . . ., pp. 119–152).

[700] Six conferences were held from 1927 to 1935. In accordance with a decision taken by the Sixth Committee of the General Assembly at its 1314th meeting, during the Assembly's twenty-seventh session, the Secretariat carried out a study on international terrorism (A/C.6/418 and Add. 1), which includes a chapter on the work of these conferences.

[701] See arts. 1 and 2 on terrorism proposed at the Third International Conference on the Unification of Penal Law (Brussels, 26–30 June 1930), *Actes de la Conférence* (Brussels, Office de publicité, 1931), p. 194, annex B, sect. III. See also annex I of the reports on the same subject submitted at the Sixth International Conference on the Unification of Penal Law (Copenhagen, 31 Aug.–3 Sept. 1935), *Actes de la Conférence* (Paris, Pedone, 1938), p. 176, part two, sect. IV.

[702] The scope of the Protocols is broad. Protocol I consists of 102 articles as well as annexes; it deals extensively with the wounded, sick and shipwrecked (part II), the methods and means of warfare, combatant and prisoner-of-war status (part III), and execution of the Geneva Conventions and of Protocol I (Part V), as well as with the civilian population (part IV), our concern here. And this latter part treats, in addition to water-related matters (arts. 54–56), of protection of cultural objects and of places of worship (art. 53), of refugees and stateless persons (art. 73), of women (art. 76), of children (arts. 77–78) and of journalists (art. 79), among other topics such as relief actions (art. 70) and reunion of dispersed families (art. 74). An International Fact-finding Commission, with a procedure for recognition of the Commission's competence *ipso facto* and without special agreement, is an important institution created by Protocol I (art. 90); its constitution and competence may merit study in connection with the elaboration of provisions on settlement and avoidance of disputes for the law of international watercourses. Protocol II contains only 28 articles, yet covers many of the same issues as Protocol I for internal armed conflict, i.e. between a party's "armed forces and dissident armed forces or other organized armed groups which, under responsible command, exercise such control over a part of its territory as to enable them to carry out sustained and concerted military

(Continued on next page)

nonetheless, especially in view of the considerable negotiations that finally led to the agreed texts of the Protocols, departure by the Commission from their provisions should be undertaken with caution.[703] Accordingly, comparison of the provisions of the proposed article with the terms of the Protocols may be of use.

(a) *Paragraph 1 of the draft article*

417. Paragraph 1 of proposed article 13 employs rather traditional language on this point: that the poisoning of shared water resources is to be prevented by engaging the best efforts of system States. The principle is obliquely and differently expressed in Protocol I, were the destruction or rendering useless of, among other things, "drinking water . . . supplies" is prohibited.[704] The proposed rule in paragraph 1 is straightforward and comprehensive.

(b) *Paragraph 2 of the draft article*

418. Paragraph 2, dealing with the protection of hydraulic works and other facilities, is in substantially close correspondence with both Protocols. The language of the paragraph, however, is more compact. No enumeration of the kinds of works intended is given. But it is contemplated that works other than "dams, dikes and nuclear electrical generating stations" may be dangerous;[705] thus the wording is more general. Protected works must, however, be associated, that is, closely connected, with an international watercourse system. The application of the rule in peacetime, as well as in time of armed conflict, is naturally and intentionally broader than in the Protocols. The existence of hostilities is not what makes hydraulic installations vital or dangerous. The language "shall not be attacked, destroyed or damaged", is preferred to "shall not be made the object of attack" in the Protocols, inasmuch as the prohibition does not contemplate action by armed forces only.

419. The situation of armed conflict, however, is given specific consideration in paragraph 2. The duty to spare the protected works is lifted where it is objectively evident that offensive military use is being made of the installations or facilities. Cast in more concise form, this exception coincides generally with article 56, paragraph 2, of Protocol I.[706]

420. In one important respect the proposed article is substantially less restrictive than Protocol I. Dams, dikes and nuclear generating plants, according to that international agreement, are not to be attacked even if they *are* military objectives; then it also exempts "other" military objectives at or in the vicinity of the works or installations from attack, if the result would be the release of dangerous forces and consequent severe losses among the civilian population.[707] The article here proposed, however, does not consider nearby military "objectives". It intentionally extends protection only to hydraulic and other water-related facilities. To do otherwise would amount to an unjustifiable departure from the proper terms of reference of the topic.[708] In addition, the proposed paragraph speaks of military positions and military apparatus, terms which denote use for military purposes; the phrase "military objectives" used in the Protocols signifies in the military vocabulary, in a specific sense, all targets deemed by a party to an armed conflict worthy of capture, destruction, neutralization, etc., and would certainly embrace the key physical infrastructure of the "enemy", including such facilities as are intended to be protected. These need not be used for any "military" purpose. The term "objectives", for that reason, has not been employed in the proposed draft article.

(c) *Paragraph 3 of the draft article*

421. Paragraph 3 states the duty of the State in whose territory the potentially perilous installations or facilities are situated: use of such works for offensive military purposes is proscribed, in line with the requirement in Protocol I that the parties endeavour not to locate "military objectives in the vicinity of" the protected works or installations, except installations for defensive actions to protect the works. Armament for such positions must be limited to weapons capable only of "repelling hostile action against the protected works".[709]

(d) *Paragraph 4 of the draft article*

422. Paragraph 4 mandates consultations among system States with a view towards agreement on safety and security matters to combat sabotage. The corresponding provision in Protocol I urges the contracting parties and the parties to the conflict "to conclude further

(*Footnote 702 continued.*)
operations and to implement this Protocol" (art. 1, para. 1). The subject of hydraulic installations and water safety, including non-international armed conflict, has a prior and at least partly settled existence for which both Protocols, it is believed, constitute some evidence; they are the most recent intergovernmental formulations.

[703] See "Protocols additional to the Geneva Conventions on the laws of war" (American Society of International Law, *Proceedings of the 74th Annual Meeting, 1980* (Washington, D.C., 1981), pp. 191–212) (panel chairman: G. Aldrich; papers prepared by A. Rubin and H. Almond, Jr.).

[704] Art. 54, para. 2. This provision is by its terms limited to action "for the specific purpose of denying [the civilian population of certain objects] for their sustenance value". The equivalent language in Protocol II (art. 14) does not include this qualification. Of course, all provisions of these Protocols are perforce restricted to situations of armed conflict. That fact, however, furnishes no basis for concluding that the problem, considered from the perspective of the law of international watercourses, is or should be so limited.

[705] Both Protocols include the phrase "namely dams, dikes and nuclear electrical generating stations" (Protocol I, art. 56, para. 1; Protocol II, art. 15). The Protocols speak of "containing dangerous forces"; recommended to the Commission is the phrase "capable of releasing dangerous forces or substances", regarded as an improvement without substantive change of meaning, since the "release" aspect appears subsequently in the provisions referred to in both Protocols.

[706] Protocol II has no such exception. By specifying "offensive" military use in the proposed draft, it is intended to provide, as in art. 56, para. 5, of Protocol I, that "installations erected for the sole purpose of defending the protected works or installations from attack are permissible and shall not themselves be made the object of attack, provided that they are not used in hostilities except for defensive actions . . .".

[707] Art. 56, para. 1. The protection ceases with respect to such military objectives "only if they are used in regular, significant and direct support of military operations" and if such attack is the only feasible way to end that support (art. 56, para. 2 (*c*)). Protocol II has no comparable provision.

[708] No position is taken, consequently, on the question of the exempt status of military installations near protected works. Military installations at the protected works are covered.

[709] Art. 56, para. 5. Protocol II has no comparable provision.

agreements among themselves to provide additional protection for objects containing dangerous forces".[710] The paragraph comprehends water supply poisoning, as well as damage to or destruction of hydraulic works and facilities; the phrase "terrorist acts of sabotage" has been chosen to comprehend isolated acts of violence against the protected works and waters, as distinguished from acts committed by armed forces, treated in the preceding two paragraphs.[711]

423. It is taken for granted that attack *en masse*, or by sapping or infiltration, against such protected installations, and acts of poisoning, whether by individuals or groups, are prohibited acts in municipal law. Often absent is the transnational co-ordination of security and of safety programmes. Active co-operation in these matters does not appear central to the Geneva Protocols.[712]

(e) *Paragraph 5 of the draft article*

424. The benefit, especially in humanitarian terms, of helping to avert calamity by warning one's neighbour is manifest and already established in this report in connection with accidental hazardous events.[713] In this section of the report, dealing with the poisoning of drinking water and with devastation as the result of damage to water-related works, the need to provide for the uninterrupted operation of arrangements for communicating disaster warnings and information may be self-evident. The provision requiring system States to continue this specific kind of co-operation even during hostilities is contained in paragraph 5 of the draft article. It presumes the existence of warning systems between States. More accurately, the paragraph could not be operative if such a system had not been established prior to the initiation of armed conflict.

425. Chapter IV ("Precautionary measures") of part IV of Protocol II contains provisions related to such a rule: "Constant care shall be taken to spare" both the civilian population and "civilian objects".[714] Such care would certainly include warning systems, where possible. The avoidance, or in any event the minimizing of the loss of life and injury to civilians, and of damage to "civilian objects" is part of the requirement in Protocol I that "all feasible precautions" be taken in choosing the means and methods of armed attack.[715] At least arguably, one such "means" could include, regardless of adversary or friendly status, the transmission of a warning to a system State certain or likely to be affected by the poisoning of or damage to a facility.

426. The requirement in the proposed text to "sustain" warning systems is not absolute, only "to the extent possible". Protocol I requires "effective advance warning"—and this would include warning an adverse party—of attacks that may affect the civilian population, "unless circumstances do not permit".[716]

(f) *Paragraph 6 of the draft article*

427. A basis for the first part of paragraph 6 of the proposed article—prohibiting the cutting off of a population's vital water supply—is found in several provisions of the Protocols. Protocol I makes it illegal to "remove" drinking water, "whether in order to starve out civilians, to cause them to move away, or for any other motive".[717] It is true that, under Protocol I, "derogation from the prohibitions contained in paragraph 2 may be made by a party to the conflict . . . where required by imperative military necessity".[718] However, "in no event shall actions . . . be taken which may be expected to leave the civilian population with such inadequate food or water as to cause its starvation or force its movement".[719] Paragraph 6 of the proposed article is not subject to the derogation clause just quoted.

428. It must be acknowledged that the doctrine of military necessity has not been incorporated in this draft, as another issue involving far-reaching considerations in the "law of war".[720] An effort was made to draft this paragraph in such a way that at least a traditional clause on military necessity might be obviated. This, however, is one of several problems that would require consideration should the Commission decide to include an article of this kind in its draft articles.

429. The second element in the proposed paragraph 6, prohibiting the diversion of water so as "to imperil the viability of the environment" is amply supported by a special article of Protocol I:

Article 55—Protection of the natural environment

1. Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.

2. Attacks against the natural environment by way of reprisals are prohibited.

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[710] Art. 56, para. 6. Protocol II has no comparable provision. Draft paragraph 4 is consistent with and reinforces other provisions of these draft articles concerning the duty to consult and negotiate.

[711] All non-accidental and wilfully negligent acts (not committed by military forces) damaging to, or destructive of, protected works could simply be defined as "sabotage". The term "terrorist acts of sabotage" may serve to intensify the disapprobation of the international community; the need to foster system agreements covering this problem area is unmistakable. It is expected that an article on definitions will properly delimit the chosen term.

[712] But art. 89 ("Co-operation") of Protocol I reads: "In situations of serious violations of the Conventions or of this Protocol, the . . . parties undertake to act jointly or individually, in co-operation with the United Nations and in conformity with the . . . Charter"; art. 88 deals with "mutual assistance in criminal matters".

[713] See chap. II, sect. G, above.

[714] Art. 57, para. 1.

[715] Art. 57, para. 2 (*a*) (ii).

[716] Art. 57, para. 2 (*c*).

[717] Art. 54, para. 2. The equivalent provision in Protocol II, art. 14, expressly prohibits "starvation" of civilians as a method of combat; "to . . . remove . . . drinking water . . ." is also prohibited without qualification. Protection under Protocol I is not applicable if the objects (e.g. "drinking water installations and supplies and irrigation works") are used by an adverse party "as sustenance solely for the members of its armed forces" or "in direct support of military action" (art. 54, para. 3 (*a*) and (*b*)). There is no similar provision in Protocol II.

[718] Art. 54, para. 5. Except for the language of art. 3, para. 1, no such provision is found in Protocol II.

[719] Art. 54, para. 3 (*b*).

[720] See e.g. Oppenheim, *op. cit.*, pp. 232–233, 415–416, and works there cited; W. Downey, Jr., "The law of war and military necessity", *The American Journal of International Law*, vol. 47, 1953, p. 251; E. Castrén, *The Present Law of War and Neutrality* (Helsinki, Suomalainen tiedeakatemia, 1954), especially p. 66; R. Tucker, *The Law of War and Neutrality at Sea* (Washington, D.C., 1957), pp. 33–37, and works there cited.

430. Protocol I is devoted to the regulation of international armed conflict, and so the general provision quoted above, in paragraph 1, addresses prohibited methods and means of warfare. But if such protection of the environment can be exacted under conditions of warfare, *a fortiori* that protection ought to prevail in peacetime.

C. Interaction with navigational uses

431. The topic before the Commission is, it may be recalled, "The law of the non-navigational uses of international watercourses". The Commission, in its questionnaire on the scope of its study, raised the relevant question of the interrelationship between navigational uses and other uses.[721]

1. Previous consideration of the question of navigational uses

432. After review of this question at the outset of his work on the topic, the Special Rapporteur reached these conclusions in his first report:

> As the replies of States to the Commission's questionnaire and the facts of the uses of water indicate, the impact of navigation on other uses of water and that of other uses on navigation must be addressed in the Commission's draft articles. Navigation requirements affect the quantity and quality of water available for other uses. Navigation may and often does pollute watercourses and requires that certain levels of water be maintained; it further requires passage through and around barriers in the watercourse. The interrelationships between navigational and non-navigational uses of watercourses are so many that, on any watercourse where navigation is practised or is to be instituted, navigational requirements and effects and the requirements and effects of other water projects cannot be separated by the engineers and administrators entrusted with development of the watercourse . . .[722]

433. Based upon these considerations, a draft provision was put forward tentatively, embracing navigation in the Commission's articles insofar as provisions of the articles respecting other uses of water affect navigation or are affected by navigation.[723] Subsequent discussion of this portion of the Special Rapporteur's first report on the scope of the topic did not challenge the appropriateness of such a provision.[724] Consequently, the draft provision relating to navigation in the second report retained substantially the language originally proposed.[725]

434. After discussion within the Commission, the draft articles as revised by the Special Rapporteur were referred to the Drafting Committee during the course of the thirty-second session. The Drafting Committee revised and refined the language of all but one of the draft articles submitted by the Special Rapporteur and reported back to the Commission; the Commission, in turn, provisionally adopted draft articles 1 to 5 and article X.[726] With respect to the provision here under consideration, the Commission's draft provides:

> The use of the waters of international watercourse systems for navigation is not within the scope of the present articles except in so far as other uses of the waters affect navigation or are affected by navigation.[727]

The Commission's commentary to the provision

> . . . recognizes that the exclusion of navigational uses . . . cannot be complete. As both the replies of States to the Commission's questionnaire and the facts of the uses of water indicate, the impact of navigation on other uses of water and that of other uses on navigation must be addressed in the present articles . . . [The provision] has been negatively cast, however, to emphasize that navigational uses are not within the scope of the present articles except in so far as other uses of waters affect navigation or are affected by navigation . . .[728]

435. In the Sixth Committee of the General Assembly, in the debate on the Commission's report and provisionally adopted articles on this topic, only a few representatives commented on this particular provision (see para. 16 above).[729] The Commission's conclusion, that it must deal with the frequent and significant interactions between navigational uses and other uses, when they in fact are present, was understood and generally accepted.

2. Navigation and provisional article 5

436. This section takes up the implementation of that general proposition in express terms. Implementation by implication may be said to have been already achieved by the broad terms of the Commission's draft article 5, "Use of waters which constitute a shared natural resource";

> 1. To the extent that the use of waters of an international watercourse system in the territory of one system State affects the use of waters of that system in the territory of another system State, the waters are . . . a shared natural resource.
>
> 2. Waters of an international watercourse system which constitute a shared natural resource shall be used by a system State in accordance with the present articles.[730]

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[721] Item G. See final text of the questionnaire in *Yearbook . . . 1980*, vol. II (Part Two), p. 105, para. 69.

[722] *Yearbook . . . 1979*, vol. II (Part One), pp. 158–159, document A/CN.4/320, para. 61.

[723] Draft art. 1, para. 2 (*ibid.*, p. 158, para. 60).

[724] See *Yearbook . . . 1980*, vol. II (Part One), pp. 161–163, document A/CN.4/332 and Add. 1, paras. 6–26.

[725] "The use of water of international watercourses for navigation is within the scope of these articles in so far as provisions of the articles respecting other uses of water affect navigation or are affected by navigation" (draft art. 1, para. 2) (*ibid.*, p. 167, document A/CN.4/332 and Add. 1, para. 52).

[726] *Yearbook . . . 1980*, vol. II (Part Two), pp. 110 *et seq.*

[727] Art. 1, para. 2.

[728] Para. (12) of the commentary to art. 1 (*ibid.*, p. 111). The commentary bases itself on and substantially repeats the findings of the Special Rapporteur quoted above. It was recorded that one member favoured omission of the provision as beyond the scope of the Commission's mandate on the topic.

[729] The interrelationship was given legal significance as early as 1888 in the arbitration between Costa Rica and Nicaragua concerning the San Juan River. The arbitrator, G. Cleveland, gave the opinion that the execution of works of improvement by Nicaragua on its own territory could not be prevented by Costa Rica "provided such works . . . do not result [*inter alia*] . . . in the destruction or serious impairment of the navigation of the river or any of its branches at any point where Costa Rica is entitled to navigate the same" (J. B. Moore, *History and Digest of International Arbitrations to which the United States has been a Party*, (Washington, D.C., U.S. Government Printing Office, 1898), vol. II, pp. 1964–1965) (see also *Yearbook . . . 1974*, vol. II (Part Two), p. 191, document A/5409, para. 1041). For recent examples, see the 1964 Convention relating to the status of the Senegal River (Guinea, Mali, Mauritania, Senegal), requiring submission to the Interstate Committee of the riparian States of projects whose execution was likely to alter, *inter alia*, the conditions of navigability of the river (art. 3) (*Revue juridique et politique* (Paris), XIXth year, No. 2, 1965), p. 299; see also *Yearbook . . . 1974*, vol. II (Part Two), p. 290, document A/CN.4/274, para. 47. Similarly, see the 1963 Act regarding navigation and economic co-operation between the States of the Niger Basin (Cameroon, Chad, Dahomey, Ivory Coast, Guinea, Mali, Niger, Nigeria, Upper Volta), preamble, third para.; art. 2, second para.; art. 4 (United Nations, *Treaty Series*, vol. 587, pp. 11–13).

[730] *Yearbook . . . 1980*, vol. II (Part Two), p. 120.

437. It will be noted that "use" in that article is not limited to non-navigational uses, nor can it logically or properly be so limited. Though the specifics of regulation by general international law of the navigational uses are not to be taken up, the status of a shared resource comprehends conflicts between uses and the intimately related problems of, for example, pollution, environmental protection, hazards, public safety and improvement works for regulation. Navigation is or may be involved with each of these aspects, if the international watercourse is used for, or will be used for, navigation.[731]

3. *Ipso facto* priority and equitable sharing

438. The concept of what is now termed "shared natural resource" is said to have had its origins in the use of an international watercourse for navigational purposes. Riparians learned to share the use of the watercourse for navigation in promotion of their several and mutual interests. When other uses became economically and socially important, the body of law associated with non-maritime navigation provided precedent by analogy for the principle of equality of right and then its modern formulation, equitable utilization with respect to all beneficial uses.[732] The principle of equitable participation advanced in this report (see chap. II, sect. B, above) further subjects any use, including navigation, to consideration of certain non-use aspects of the protection and control of international watercourses.

439. Because navigation was historically the first economically important use,[733] it gained a privileged position not only vis-à-vis other uses as they rose to prominence but also with respect to the building of bridges, watercourse safety and river regulation in general. All watercourse-related activities had to yield to the requirements of navigation.[734]

440. A prime example of that posture of preference, developed in Europe and imparted to other parts of the world, is found in the 1921 Barcelona Convention and Statute on the régime of navigable waterways of international concern:

> Each riparian State is bound, on the one hand, to refrain from all measures likely to prejudice the navigability of the waterway, or to reduce the facilities for navigation, and, on the other hand, to take as rapidly as possible all necessary steps for removing any obstacles and dangers which may occur to navigation.[735]

441. The "Declaration of Montevideo", approved by the Seventh International Conference of American States in 1933, even though dedicated to the use of international waters for industrial or agricultural purposes, gave priority to navigation:

> In no case either where successive or where contiguous rivers are concerned, shall the works of industrial or agricultural exploitation performed cause injury to the free navigation thereof.[736]

442. By the time the Inter-American Juridical Committee produced its revised draft convention on the industrial and agricultural uses of international rivers and lakes in 1965, the corresponding provision had been softened somewhat, but still looked backward to a preference for navigation:

> The utilization of the waters of an international river or lake for industrial or agricultural purposes must not prejudice the free navigation thereof in accordance with the applicable legal rules . . . .[737]

443. The following year, the Inter-American Economic and Social Council spoke of

> control and economic utilization of the hydrographic basins and

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[731] On environmental pollution and protection, and on hazards, see chap. II above, sects. F and G respectively; on safety, and on regulation, see sects. B and A respectively. When the Institute of International Law adopted its "Salzburg resolution" on "utilization of non-maritime international waters (except for navigation)", it none the less did not exclude navigational uses from its general rules: "Every State has the right to utilize waters which traverse or border its territory . . ." (art. 2, first para.); "If the States are in disagreement over the scope of their rights of utilization, settlement will take place on the basis of equity . . ." (art. 3); "No State can undertake works or utilizations of the waters of a watercourse or hydrographic basin which seriously affect the possibility of utilization of the same waters by other States except on condition of assuring them the enjoyment of the advantages to which they are entitled . . ." (art. 4) (*Annuaire de l'Institut de droit international, 1961* (Basel), vol. 49, Part Two, pp. 381–383). The rules of the International Law Association on the uses of the waters of international rivers (the "Helsinki Rules"), which however include an entire chapter (chap. 4) on navigation, also cast the general rules to include all uses (e.g. art. IV: "Each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the water of an international drainage basin" (ILA, *Report of the Fifty-second Conference, Helsinki, 1966* (London, 1967), p. 486).

[732] On the development of these principles and their application in the draft articles proposed for consideration by the Commission, see *Yearbook . . . 1980*, vol. II (Part Two), pp. 127–132, sect. 5 of the commentary to art. 5 and treaties and studies there cited, and *Yearbook . . . 1980*, vol. II (Part One), pp. 188–194, document A/CN.4/332 and Add. 1, paras. 186–214. See also J. Lipper, "Equitable utilization", *The Law of International Drainage Basins*, A. H. Garretson, R. D. Hayton and C. J. Olmstead, eds. (Dobbs Ferry, N.Y., Oceana Publications, 1967), pp. 28–29 and 73, note 59 *d*.

[733] At least in those parts of the world most influential in the development of international law. Fishing, the use of water for power by mills, irrigation, timber-floating and stock watering were also early uses, in addition to domestic uses, but only later attained "international" recognition (see F. Berber, *Rivers in International Law* (London, Stevens, 1959), pp. 5–6).

[734] On the development and scope of the international law of navigation, see *inter alia* the literature cited in P. Ogilvie, *International Waterways* (New York, Macmillan, 1920); O. Gönnenwein, *Die Freiheit der Flusschiffahrt* (Stuttgart, Kohlhammer, 1940); D. Vignes, "L'égalité du traitement des usagers dans les transports internationaux", *Annuaire français de droit international, 1958* (Paris), vol. IV, p. 144; D. P. O'Connell, *International Law*, 1st ed., vol. 1 (London, Stevens, 1965), pp. 625–639.

[735] Art. 10, para. 1, of the Statute (League of Nations, *Treaty Series*, vol. VII, p. 57).

[736] Art. 5 (Carnegie Foundation for International Peace, *The International Conferences of American States, First Supplement, 1933–1940* (Washington, D.C., 1940), p. 88; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 212, document A/5409, annex I, A.) Not only were such works not to injure free navigation "but, on the contrary, [they shall] try to improve it in so far as possible" (art. 6). The Conference adopted the language of rule II. 4 of the "Madrid resolution" of the Institute of International Law (*Annuaire de l'Institut de droit international, 1911* (Paris), vol. 24, p. 366).

[737] Art. 5 (Pan American Union, *Report of the Inter-American Juridical Committee on the Work accomplished during its 1965 Meeting* (Washington, D.C., 1966), p. 7, reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 350, document A/CN.4/274, para. 379). The draft convention was not altogether well received, apparently in part because of this provision. Emphasis on navigation was already criticized in "Preliminary review of questions relating to the development of international river basins in Latin America" (E/CN.12/511). See also G. J. Cano, "Problemas jurídicos e institucionales de los proyectos multinacionales de desarrollo hídrico en América Latina y el Caribe", *Corporaciones públicas multinacionales para el desarrollo y la integración de la América Latina y el Caribe*, M. Kaplan, ed. (Mexico, Fondo de cultura económica, 1972), p. 274; I. Zanotti, "Aproveitamento dos rios e lagos internacionais para fins industriais e agrícolas", *Boletim da Sociedade brasileira de direito internacional* (Rio de Janeiro), 20th year, Nos. 39 and 40, 1964, p. 5; M. A. Espeche Gil, *Direito internacional público especializado* (Rio de Janeiro, Pontifícia Universidade Católica, 1963).

streams . . . for the purpose of promoting, through multinational projects, their utilization for the the common good, in transportation, the production of electric power, irrigation works and other uses, and particularly in order to control and prevent damage such as periodically occurs as the result of . . . floods.[738]

Though "transportation" heads the list of uses, after "utilization for the common good", the Council's equal interest in other uses and aspects is clear.

444. There seems little doubt but that, today, navigation has been deprived of its preferential status. System States may still establish any priority of uses by agreement; where navigation is still the predominant use, it may thus still enjoy the traditional preference. But such cases are becoming fewer as treaties are being revised and international watercourses are being subjected to multiple uses; system States are also taking a more integrated approach to development, protection and control of the resource.[739] Some treaties still give first priority to navigation; others favour different uses.[740]

445. The change may be illustrated, even for a region where navigation has long reigned supreme, by quoting from the Declaration of Asunción on the use of international rivers:

5. The States shall do their best to maintain the best possible conditions of navigability on the reaches of the rivers under their sovereignty and shall adopt for that purpose whatever measures may be necessary to ensure that any permanent works that are constructed do not interfere with the other present uses of the river system.

6. When executing permanent works for any purpose on rivers of the Basin, the States shall take the necessary steps to ensure that navigability is not impaired.

7. When executing permanent works on the navigable waterways system, the States shall ensure the conservation of the living resources.[741]

446. Also, the 1969 Convention concerning development of the Rhine between Strasbourg/Kehl and Lauterbourg/Neuburgweier, between France and the Federal Republic of Germany, reflects the broader approach:

The development . . . shall be carried out in such a way as not to cause . . . any adverse change in the present water-table or in the flow conditions of the old arms of the Rhine and its affluents. The development must not result in any serious impedient to navigation. The interests of water supply, agriculture and fisheries shall be preserved. Consideration shall also be given, to the fullest extent possible, to protection of the landscape.[742]

447. In 1927, concerned with the hydro-electric development of the Douro River, Portugal and Spain declared "that they will not recognize the river as a navigable waterway . . . in the zones of the international section, where such a character would be incompatible with the full use of the zones of development".[743] Thus, although in many international watercourses navigation remains a leading use, system States are now mindful of the importance of other uses and of other, non-use, considerations.

4. Clarifying priority with respect to residual articles

448. Whether by agreement States accord priority to navigation or to any other use is not of consequence to the Commission's articles. What is relevant is the general abandonment of the former automatic preference for navigation over *other* uses, which are central to the topic. Priority constitutes the key legal interrelationship between non-navigational and navigational uses in general international law. That shift, one consequence of the reception by system States of the doctrines of equitable utilization and environmental protection, should receive expression.

449. The International Law Association took this position in 1966:

A use or category of uses is not entitled to any inherent preference over any other use or category of uses.[744]

5. The proposed article

450. The motivation for examining the aspect of preference, or priority, was provided by the need to delimit the role of navigation in these articles in a manner consistent with multipurpose utilization, and the larger concept of equitable participation. It was soon realized, however, that the problem was in fact not limited to navigational uses. None the less, survival of special deference to navigation in a number of international watercourse treaties seems to make it

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[738] Resolution 24-M/66, "Control and economic utilization of hydrographic basins and streams in Latin America" (sole operative para.) (Pan American Union, *Final Report of the Fourth Annual Meeting of the Inter-American Economic and Social Council* (Washington, D.C., 1966), vol. I, p. 48; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 351, document A/CN.4/274, para. 380).

[739] See *inter alia* Lipper, *loc. cit.*, pp. 60–62; G. J. Cano, *Recursos hidricos internacionales de la Argentina* (Buenos Aires, de Zavalia, 1979), especially pp. 94, 98 and 116–124; UNITAR, *International Navigable Waterways—Financial and Legal Aspects of their Improvement and Maintenance* (New York, 1975); "Legal aspects of hydroelectric development of rivers and lakes of common interest" (E/ECE/136-E/ECE/EP/98/Rev.1, pp. 21, 35, 92); H. A. Smith, *The Economic Uses of International Rivers* (London, King, 1931), pp. 143, 150; United States of America, Memorandum of the Department of State of 21 April 1958, "Legal aspects of the use of systems of international waters with reference to the Columbia-Kootenay River system under customary international law and the Treaty of 1909" (85th Congress, 2nd session, Senate document No. 118, pp. 88–91).

[740] See agreements concerning navigation cited in Lipper, *loc. cit.*, pp. 86–87, notes 206 and 213.

[741] Resolution 25, of 3 June 1971, adopted by the Ministers for Foreign Affairs of the River Plate Basin States (Argentina, Bolivia, Brazil, Paraguay, Uruguay) at their Fourth Meeting (Organization of American States, *Rios y lagos internacionales (utilización para fines agrícolas e industriales)* (Washington, D.C., 1971, p. 188). (Reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 324, document A/CN.4/274, para. 326.)

[742] Art. 2, para. 1 (United Nations, *Treaty Series*, vol. 760, p. 347). The "development" referred to involves a fixed dam in the river, a movable weir, a set of locks, a hydroelectric plant, levees, side channels and appurtenant works; progressive paving of the bed and supplementary measures to deepen the navigable channel are envisaged (art. 1, paras. 1 and 3).

[743] Art. 6, first para., of the 1927 Convention to regulate the hydroelectric development of the international section of the River Douro (League of Nations, *Treaty Series*, vol. LXXXII, p. 135). Were the parties to decide that the development of navigation on the Douro was desirable, a special convention was to be required "concerning the method of carrying out the work and of affecting transport without interfering with the hydroelectric operations" (art. 6, second para.).

[744] Art. VI of the Helsinki Rules (ILA, *Report of the Fifty-second Conference . . .*, p. 491). It should be recalled that the Helsinki Rules were designed to apply if the matter was not governed "otherwise by convention, agreement or binding custom among the basin States" (art. I). The commentary in support of art. VI states: "In the past twenty-five years . . . the technological revolution and population explosion, which have led to the rapid growth of non-navigational uses, have resulted in the loss of the former pre-eminence accorded navigational uses. Today, neither navigation nor any other use enjoys such a preference. A drainage basin must be examined on an individual basis and a determination made as to which uses are most important . . .".

desirable to identify navigational uses in a draft article on use preference.

451. In the belief that this approach, including the already approved provision in article 1, meets the problem of navigation in these articles, at least until consideration of particular uses is undertaken, the following text is proposed for possible consideration of a successor Special Rapporteur and of the Commission:

Article 14. Denial of inherent use preference

1. Except as may otherwise be provided by system agreements in force or locally binding custom, neither navigation nor any other use enjoys an automatic preference over other uses.

2. Each use shall be weighed along with any conflicting uses and other considerations relevant to the particular international watercourse system in determining a system State's equitable participation, in accordance with articles 6 and 7 of these articles.

D. Administrative arrangements for international watercourse systems

452. It can readily be discerned from the complex dynamics of man's relationships with and dependence upon water, including the water resources of international watercourse systems, that mere defence-of-rights postures, or even spasmodic co-operative efforts, are now utterly unsuited to the circumstances of most international watercourses. The requirements of use, protection and control, moreover, are increasing at a rapid pace, as are the costs and sophistication of the indicated and effective measures to meet those requirements.

1. Advances in State practice

453. Numerous international watercourse systems are now provided with permanent institutional machinery, tailored to the needs of the participating system States and the singularities of the shared water resources.[745] These advances, from *ad hoc* or sporadic negotiations and agreement-making through diplomatic channels to institutionalized collaboration involving data sharing, studies, analysis and projects and programmes, manifest the commitment of the parties to "manage" their shared water resources technically and in a more integrated fashion than would otherwise be possible. These international river and lake organizations vary widely in their capacities and competences, and have a long history of development.[746]

[745] The secretariat has compiled, for the use of the Special Rapporteur, an annotated list of multipartite and bipartite commissions concerned with non-navigational uses of international watercourses. For summary descriptions of the institutional scope, composition, operations, functions, administrative arrangements, decision-making processes and financing arrangements of 18 such international watercourse organizations, "selected to illustrate the widest possible variety of arrangements", see United Nations, *Management of International Water Resources: Institutional and Legal Aspects*, Natural Resources/Water Series No. 1 (Sales No. E.75.II.A.2), p. 198, annex IV.

[746] A number of studies have been published on international river commissions. See *inter alia* N. Ely and A. Wolman, "Administration", *The Law of International Drainage Basins* (*op. cit*), p. 124; J. D. Chapman, ed., *The International River Basin: Proceedings of a Seminar on the Development and Administration of International River Basins* (Vancouver, 1961) (Vancouver, University of British Columbia, 1963); L. A. Teclaff, *The River Basin in History and Law* (The Hague, Nijhoff, 1967); T. Parnall and A. E. Utton, "The Senegal Valley Authority: a unique experiment in international river basin planning", *Indiana Law Journal* (Bloomington, Ind.), vol. 51, 1976, p. 235; L. Wehle, "International administration of European inland waterways", *The American Journal of International Law*, vol. 40, 1946, p. 100; Secretariat of the Danube Commission, "Practice and principles of development of the Danube basin", document No. 12 submitted at the Seminar on the Development and Administration of International River Basins (Vancouver, 1961); Commission centrale pour la navigation du Rhin, *Le Rhin, son statute, son organisation et son traffic*, 1965; G. Waite, "The International Joint Commission: its practice and its impact on land use", *Buffalo Law Review* (Buffalo, N.Y.), vol. 13, 1963, p. 93; C. Hart Schaaf and R. H. Fifield, *The Lower Mekong: Challenge to Co-operation in South-East Asia* (Princeton, N.J., Van Nostrand, 1963); M. Schreiber, "Vers un nouveau régime international du fleuve Niger", *Annuaire français de droit international, 1963* (Paris), vol. IX, p. 866, and by the same author, "Accord relatif à la Commission due fleuve Niger et à la navigation et aux transports sur le fleuve Niger", *ibid.*, 1964, vol. X, p. 813; ECLA, "Sistemas de organización administrativa para el desarrollo integrado de cuencas hidráulicas: exposición de los diferentes tipos de estructura institucional utilizados en América Latina y en el resto del mundo" (E/CN.12/503); A. Lepawsky, "International development of river resources", *International Affairs* (London), vol. 39, No. 4, 1963, p. 533; W. Kenworthy, "Joint development of international waters", *The American Journal of International Law*, vol. 54, 1960, p. 592; Y. Baskin, "The contemporary international régime of the Rhine and Rhine navigation". *Soviet Year-Book of International Law 1960* (Moscow), p. 206 (English summary at p. 216); L. M. Bloomfield and G. F. 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Sauveplanne, "L'autorité centrale en droit rhénan", *Nederlands tijdschrift voor internationaal recht* (Leyden), 1953–1954, No. 2, 1954, p. 140; K. Sinha, "A note on organization for effective execution of river basin development" (United Nations, *Proceedings of the Regional Technical Conference on Water Resources Development in Asia and the Far East, 1954*, Flood Control Series No. 9 (Sales No. 1956.II.F.3), p. 433); P. Biays, "La Commission centrale du Rhin", *Revue générale de droit international public* (Paris), 3rd series, vol. XXIII, No. 2, 1952, p. 223; Baxter, "The Indus Basin", *The Law of International Drainage Basins* (*op. cit*), p. 443; R. W. Johnson, "The Columbia Basin", *ibid.*, pp. 167; J. F. Friedkin, "The Colorado River: international aspects", *Pollution and International Boundaries: United States–Mexican Environmental Problems*, A. E. Utton ed. (Albuquerque, N.M., University of New Mexico, 1973), p. 36; C. Sepulveda, "Implications for the future: design of viable international institutions", *Natural Resources Journal* (Albuquerque, N.M.), vol. 15, 1975, p. 215; D. J. LeMarquand, *International Rivers: the Politics of Co-operation* (Vancouver, University of British Columbia, 1977), and works there cited; L. B. Dworsky, "Summary of discussions and findings on co-operative management and development of international river basins" (United Nations, *River Basin Development: Policies and Planning* (Sales No. E.77.II.A.4), vol. II, p. 132; S. Gorove, *Law and Politics of the Danube* (The Hague, Nijhoff, 1964); J.-C. André, "L'évolution du statut des fleuves internationaux d'Afrique noire", *Revue juridique et politique—Indépendance et coopération* (Paris), vol. 19, No. 2, 1965, p. 285; J.-C. Gautron, "L'aménagement du bassin du fleuve Sénégal", *Annuaire français de droit international, 1967* (Paris), vol. XIII, p. 690; A. Eisenberg, *El aprovechamiento del río Uruguay y el derecho internacional* (Montevideo, Facultad de derecho y ciencias sociales, 1963); G. Vailati, "Le régime international du fleuve Niger", *Revue de droit international de sciences diplomatiques et politiques* (Geneva), 49th year, No. 1, 1971, p. 31; P. K. Menon, "The Mekong River and international development of natural resources", *The International Lawyer* (Chicago, Ill.), vol. 5, No. 1, 1971, p. 53; United Nations, *Management of International Water Resources . . .*, and works there cited. Earlier works, as well as instructive studies on the general principles of water resources

(*Continued on next page.*)

2. THE MODERN DOCTRINE

454. A number of United Nations studies have pointed out the advantages of such institutional arrangements for the management of international watercourse systems.[747] The 1974 draft European convention for the protection of international watercourses against pollution would require system States "to enter into negotiations with each other, if one of them so requests, with a view to concluding a co-operation agreement or to adapting existing co-operation agreements to the provisions of" the convention.[748] Subsequent provisions urge the establishment, and delineate the necessary functions, of international watercourse commissions:

Article 14

1. The co-operation agreement . . . shall, unless the interested contracting parties decide otherwise, provide for the establishment of an international commission and lay down its organization, its modes of operating and, if necessary, the rules for financing it.

2. The co-operation agreement shall, where appropriate, provide that any existing commission or commissions shall be assigned the functions provided for in article 15.

3. Where two or more international commissions exist for the protection against pollution of the waters . . ., the interested contracting parties undertake to co-ordinate their activities in order to improve the protection of the waters of the basin.

Article 15

1. Each international commission for water protection shall have *inter alia* the following functions:

(*a*) To collect and to verify at regular intervals data concerning the quality of the water of the international watercourse;

(*b*) To propose, if necessary, that the interested contracting parties carry out or have carried out any additional investigation to establish the nature, degree and source of pollution; the commission may also decide to undertake certain studies itself;

(*c*) To propose to the interested contracting parties that an early warning system be set up for serious accidental pollution;

(*d*) To propose to the interested contracting parties any additional measures that it considers useful;

(*e*) To study, at the request of the interested contracting parties, the advisability and, if necessary, the methods of jointly financing large-scale projects concerning water pollution control;

(*f*) To propose to the interested contracting parties the inquiries and the programmes and objectives for reducing pollution . . .[749]

455. In 1979, at its Athens session, the Institute of International Law adopted articles on "The pollution of rivers and lakes and international law".[750]

Article VII of the Institute's articles sets forth a series of nine "ways of co-operation" that system States "shall, as far as practicable, . . . resort to" in carrying out their "duty to co-operate", established in article IV (*b*). Besides informing, notifying, consulting, co-ordinating and establishing environmental norms, one of the listed ways of co-operation is to:

Set up international commissions with the largest terms of reference for the entire basin, providing for the participation of local authorities if this proves useful, or strengthen the powers or co-ordination of existing institutions.[751]

456. Clearly the specialists in the affairs of international watercourses have concluded that the interests of the system States are best served when an international commission is able, at the very least, to study, co-ordinate and monitor the watercourse conditions and projects.

457. The draft principles of conduct in the field of the environment for the guidance of States in the conservation and harmonious utilization of natural resources shared by two or more States, prepared by the UNEP Intergovernmental Working Group of Experts, also recommends such institutional machinery:

Principle 2

In order to ensure effective international co-operation . . ., States sharing . . . natural resources should endeavour to conclude bilateral or multilateral agreements . . . in order to secure specific regulation of their conduct in this respect . . . In entering into such agreements or arrangements, States should consider the establishment of institutional structures, such as joint international commissions, for consultation on environmental problems relating to the protection and use of shared resources.[752]

(*Footnote 746 continued.*)
administration and national watercourse administration (covering also inter-provincial watercourses) have been omitted. But see L. A. and E. Teclaff, "Bibliography on legal and related aspects of the use and development of the waters of international river basins", *The Law of International Drainage Basins* (*op. cit.*), p. 609 (key to entries under "Administration" at p. 773).

[747] See especially ECE, "Legal aspects of hydro-electric development of rivers and lakes of common interest" (E/ECE/136-E/ECE/EP/98/Rev.1); United Nations, *Multi-purpose River Basin Development. Part 2D: Water Resources Development in Afghanistan, Iran, Republic of Korea and Nepal*, Flood Control Series No. 18 (Sales No. 1961.II.F.8); *Integrated River Basin Development* (Sales No. E.70.II.A.4), and *Management of International Water Resources*. . . . See also "Water resources planning experiences in a national and regional context" (TCD/SEM.80/1).

[748] Art. 12, para. 1 (Council of Europe, Consultative Assembly, doc. 3417, 4 April 1974; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), pp. 346–349, document A/CN.4/274, para. 377.) See also sect. 13, first para., of the Award in the *Lake Lanoux* arbitration (Spain–France) (United Nations, *Reports of International Arbitral Awards*, vol. XII (Sales No. 63.V.3), p. 308; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 197, document A/5409, para. 1066).

[749] Council of Europe, Consultative Assembly, doc. 3417, 4 April 1974. Art. 16 takes up the decision-making process within such commissions; art. 17 details the kinds of water quality standards, "adapted to the various possible uses of the international watercourse" (with reference to art. 15, para. 2, and to the quality limits set out in appendix III to the convention).

[750] *Annuaire de l'Institut de droit international, 1979* (Basel), vol 58, Part Two, p. 197 *et seq.* These articles are considered generally in chap. II, sect. F, above, on environmental pollution and protection.

[751] Art. VII, para. 1 (*g*) (*ibid.*, p. 202). The Institute had as early as 1911 taken an analogous position (then made applicable only to successive international watercourses) in its "Madrid resolution", on "international regulations regarding the use of international watercourses", where it recommended "that the interested States appoint permanent joint commissions, which shall render decisions, or at least shall give their opinion, when, from the building of new establishments or the making of alterations in existing establishments, serious consequences might result in that part of the stream situated in the territory of the other State" (rule II, 7) (*Annuaire de l'Institut de droit international, 1911*, vol. 24, p. 367; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 200, document A/5409, para. 1072.) The Institute's "Salzburg resolution" of 1961 on "utilization of non-maritime international waters (except for navigation)" contains a final article (art. 9) which restates the position in this language: "It is recommended that States interested in particular hydrographic basins investigate the desirability of creating common organs for establishing plans of utilization designed to facilitate their economic development as well as to prevent and settle disputes which may arise". (*Annuaire de l'Institut de droit international, 1961*, vol. 49, Part Two, p. 384; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 202, document A/5409, para. 1076).

[752] UNEP/IG.12/2, annexed to document UNEP/GC.6/17. Principle 2 is also reproduced in the commentaries to art. 3 ("System agreements" and art. 5 ("Use of waters which constitute a shared natural resource"), provisionally adopted by the Commission (*Yearbook . . . 1980*, vol. II (Part Two), pp. 117 and 124). The principles are generally reviewed in chap. II, sect. F, above, on environmental

458. The 1933 Montevideo Declaration of the Seventh International Conference of American States made express provision for a mixed technical commission, composed of technical experts from both sides, as part of its notice and information procedure where "a State plans to perform [works] in international waters".[753] The revised draft convention produced by the Inter-American Juridical Committee in 1965 retained the same approach, deleting the "technical" requirement[754] for the "Joint Commission". Meanwhile, the Consultative Assembly of the Council of Europe came to the following conclusion, in recommending joint action in the field of pollution control:

A special body for water pollution control should be set up for each international drainage area. In defining the tasks of such a body and in determining its administrative structure, account should be taken of the principles formulated in the report to the Assembly (Doc. 1965).[755]

459. ECE has an active Committee on Water Problems, whose members are governmental experts from the region. In 1971, the Committee adopted a recommendation to the Governments of ECE member States concerning river basin management, which stressed the "ever higher demands for water and an increasing deterioration of the environment", and declared:

It is accepted that only careful planning and rational management of the allocation, utilization and conservation of water resources . . . can assure that requirements will be met in the future and that the natural environment will be improved and preserved. . . .

On the basis of existing experience it appears that the improvement of water resources management may best be attained through the establishment of appropriate regional organs which operate in the framework of natural river basins, sub-basins or groups of smaller basins, as physical and administrative conditions may require . . .[756]

3. Recent international action

460. One of the recommendations adopted at the Stockholm Conference addresses this aspect of administrative machinery for the management of international watercourses:

It is recommended that Governments concerned consider the creation of river basin commissions or other appropriate machinery for co-operation between interested States for water resources common to more than one jurisdiction.

. . .

(*c*) Such arrangements, when deemed appropriate by the States concerned, will permit undertaking on a regional basis:

(i) Collection, analysis and exchanges of hydrologic data through some international mechanism agreed upon by the States concerned;

(ii) Joint data-collection programmes to serve planning needs;

(iii) Assessment of environmental effects of existing water uses;

(iv) Joint study of the causes and symptoms of problems related to water resources, taking into account the technical, economic and social considerations of water quality control;

(v) Rational use, including a programme of quality control, of the water resource as an environmental asset;

(vi) Provision for the judicial and administrative protection of water rights and claims;

(vii) Prevention and settlement of disputes with reference to the management and conservation of water resources;

(viii) Financial and technical co-operation of a shared resource.[757]

461. Stressing "an integrated approach to river basin development in recognition of the growing economic as well as physical interdependencies across national frontiers", a report by the Secretary-General on the issues before the Committee on Natural Resources of the Economic and Social Council examined the need for expanded, institutionalized co-operation among system States and made the following points, among others:

3. The occurrence of international water resources offers a unique kind of opportunity for the promotion of international amity. The optimum beneficial use of such waters calls for practical measures of international association where all parties can benefit in a tangible and visible way through co-operative action. Water is a vital resource, the benefits from which can be multiplied through joint efforts and the harmful effects of which may be prevented or removed through joint efforts . . . Moreover, when plans are made and implemented jointly, valuable experience is gained with international institutions both at the policy and working levels. A characteristic trend in more recent international arrangements for water resources development has been the broadening of the scope and diversity of the parties' international water development activities. New dimensions are being added to the traditional organizational patterns developed in Europe and in North America, which were largely based on single-purpose and non-consumptive uses of the international rivers.

. . .

13. The range of alternative institutional arrangements is impressive. It includes, for instance, the mere nomination of one official in each country who is empowered to exchange data or even development plans for a specific purpose; or it may entail the establishment of an international basin agency with its own professional staff, technical services and an intergovernmental governing body.

14. Institutional arrangements should be responsive to the specific co-ordination requirements in each case. Taking a long-term perspective, flexibility is also necessitated by the changing demands for water, the nature and characteristics of the resource base, and by other dynamic environmental influences . . .[758]

462. Subsequently the Committee on Natural Resources examined the technical and economic aspects of international river basin development.[759] It also

pollution and protection. See also Cano, *Derecho, política y administración ambientales* (Buenos Aires, Depalma, 1978).

[753] Arts. 7 and 8 (*Yearbook . . . 1974*, vol. II (Part Two), p. 212, document A/5409, annex I, A).

[754] Art. 9. (Pan American Union, *Report of the Inter-American Juridical Committee . . .*, (*op. cit.*). p. 9; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 350, document A/CN.4/274, para. 379).

[755] Para. 12 of "Guiding principles on fresh water pollution control" (Council of Europe, Consultative Assembly, recommendation 436 (1965), doc. 1965; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 342, document A/CN.4/274, para. 372). In its recommendation 629 (1971), on the pollution of the Rhine valley water-table (doc. 2904), the Consultative Assembly notes that "the management of this water reserve and its safeguarding against pollution are tasks whose effective accomplishment can only be ensured jointly by all the countries bordering on it", i.e. the Federal Republic of Germany, France, Switzerland, Luxembourg and the Netherlands (para. 8), and emphasizes "the urgent need for such co-operation . . . and the practical nature of the problems calling for common action" (para. 9) (reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 349, document A/CN.4/274, para. 378).

[756] Para. 1 (E/ECE/WATER/9, annex II; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 333, document A/CN.4/274, para. 346). Para. 2 lists 13 reasons for the establishment and/or the strengthening or co-ordination of river basin management organs, e.g. in order "to co-ordinate the programmes and activities of river basin management organs with those of corresponding organs of neighbouring countries" (subpara. (*m*)). The creation of joint or international organs is not addressed expressly.

[757] Recommendation 51 (*Report of the United Nations Conference on the Human Environment, Stockholm, 5–16 June 1972* (United Nations publication, Sales No. E. 73.II.A.14), p. 17).

[758] E/C.7/2/Add.6; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 328, document A/CN.4/274, para. 334.

[759] See *Official Records of the Economic and Social Council, Fifty-fourth Session, Supplement No. 4* (E/5247), paras. 129–137; see also E/C.7/35.

recommended the holding of a United Nations Water Conference.[760] At that Conference, held in Mar del Plata, Argentina, from 14 to 25 March 1977, numerous recommendations expressed or implied the need for improved water resources management, including management at the regional or international level.[761] The Conference adopted a special resolution on "River commissions", recommending that the Secretary-General explore:

the possibility of organizing meetings between representatives of existing international river commissions involved that have competence in the management and development of international waters, with a view to developing a dialogue between the different river basin organizations on potential ways of promoting the exchange of their experiences. Representatives from individual countries which share water resources but yet have no established basin-wide institutional framework should be invited to participate . . .[762]

4. The Dakar Interregional Meeting of international river organizations (1981)

463. The first of the meetings of international river commissions and interested countries contemplated in that Conference resolution took place in Dakar, Senegal, in May 1981.[763] Among the pertinent conclusions reached at the Meeting, the following, under topic I, "Institutional and legal arrangements", merit quotation.

4. Where it is the intention of States to establish a permanent or *ad hoc* international organization for the management of shared water resources to reflect the common interests involved, the agreement establishing this organization 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;

Decision-making procedures;

Financial provisions;

Procedures for the prevention and settlement of disputes.

5. . . . in view of the hydrologic unity of the drainage basins, it would be desirable that integrated development programmes be drawn up and possibly executed at the basin level by recognized agencies. Where this approach was not viable, co-ordination of the activities of the various agencies concerned should be sought.

6. . . . concerning the composition of administrative, managerial and technical personnel, it was felt that technical matters should be dealt with by specialists, that diplomats should assist them where problems arose and that the activities of both groups should complement one another.

7. . . . With regard to internal decision-making . . , the decision-making processes of international river basin agencies vary and provision should be made in the agreement to ensure the effectiveness of decisions taken.[764]

464. Topic II, "Progress in co-operative arrangements", included these pertinent conclusions:

1. Some co-operating States need to provide their international river and lake organizations with both competence and capability to deal effectively with the existing and impending demands for improved water resources development, use and protection, by legal and institutional arrangements that do not deprive the Governments of their final role in determining policy and controlling the actions of their agencies.

. . .

3. Where benefits and costs are to be shared, international river and lake organizations could be empowered to recommend to their respective Governments the general or specific formulas and rules for such sharing and to propose their draft determinations to the Governments concerned.

4. Water quality, water-related disease and environmental protection considerations have to date received inadequate attention in most cases, and Governments need to request their river and lake organizations to include these aspects as part of their information and

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[760] *Ibid.* (E/5247, para. 114).

[761] *Report of the United Nations Water Conference Mar del Plata, 14–25 March 1977* (United Nations publication, Sales No. E.77.II.A.12), especially pp. 7–9, 32–33, 51–57); see also specific recommendations by the regional preparatory conferences (*ibid.*, annex to chap. I, especially pp. 59–61 (Africa and Europe) and 63–65 (Western Asia). The Caracas Conference on Water Law and Administration of the International Association for Water Law, designated as a technical preparatory meeting for the United Nations Water Conference, recommended that international organizations "make every effort to support the creation of the appropriate legal régimes and of institutional machinery for the effective realization of the required multidisciplinary data base with respect to water resources", and that Governments, in cases where they share international basins, "establish mechanisms for co-operation among interested States with respect to the projects and activities that may cause pollution or other harmful effects in another State" (International Association for Water Law, *Recommendations of the Caracas Conference on Water Law and Administration* (1976), pp. 16–17, recommendations 48 and 52). Further, "mindful of the fact that the total benefits to be obtained from international water resources are greater where co-operative arrangements among co-basin countries exist, Governments may consider: (i) That ways and means be sought to establish or improve international co-operation among co-basin countries in the form of appropriate legal and administrative institutions . . ." (recommendation 52, para. (*c*)) (*ibid.*, pp. 17–18). Finally, "Governments should take into consideration, in the formulation of their water policies, that the role of law in this respect is to ensure: . . . (*f*) That, through adequate administrative machinery, the socio-economic and ecological studies be carried out that are essential for the identification and adoption of the water resources development and management policies best suited to the satisfaction . . . of the priority needs set forth in the development plans of a particular area, State or international drainage basin . . ." (recommendation 15) (*ibid.*, p. 9).

[762] Resolution VII (*Report of the United Nations Water Conference* . . ., p. 77).

[763] See United Nations, *Experiences in the Development and Management* . . ., "Report of the Meeting". Among the papers submitted to the meeting, see M. Cohen, "River basin planning: observations from international and Canada-United States experience" (*ibid.*, p. 107); Nigeria, Ministry of Water Resources, "Interregional river and lake commissions of which Nigeria is a member" (*ibid.*, p. 368); Joint Finnish–Soviet Commission, "The Joint Finnish–Soviet Commission on the utilization of frontier watercourses" (*ibid.*, p. 252); Pakistan, Office of the Commissioner for Indus Waters, "The Permanent Indus Commission" (*ibid.*, p. 376); F. Rizzo, "The Commission for the protection from pollution of common waters: Italy–Switzerland" (*ibid.*, p. 364); Permanent Joint Technical Commission for Nile Waters, "The Permanent Joint Technical Commission for Nile Waters: Egypt–Sudan" (*ibid.*, p. 158); U. Dutta "Some aspects of the Kosi project operation, Nepal" (*ibid.*, p. 415); I. Polohn and F. Szappanos, "Co-operation in water development: Hungary–Yugoslavia" (*ibid.*, p. 342); Q.-L. Nguyen, "Powers of the Organization for the Development of the Senegal River in development of the river basin" (*ibid.*, p. 142); Bangladesh, Ministry of Power, Water Resources and Flood Control, "International rivers: the experience of Bangladesh" (*ibid.*, p. 270); S. A. Ricks, "The Mano River development project" (*ibid.*, p. 165); G. J. Cano (Rapporteur), "Institutional and legal arrangements (topic I)" (*ibid.*, p. 44); R. D. Hayton (Rapporteur), "Progress in co-operative arrangements (topic II)" (*ibid.*, p. 65); K.-E. Hansson (Principal Rapporteur) and R. Revesz, "Economic and other considerations for co-operation in the development of shared water resources (topic III)" (*ibid.*, p. 82). A representative of the secretariat of the International Law Commission, L. D. Johnson, attended the meeting as an observer and conducted an informal half-day discussion with participants on the work of the Commission on the topic of the law of the non-navigational uses of international watercourses; his report (ILC (XXXIII)/Conf. Room Doc. II) has been made available to members of the Commission.

[764] *Ibid.*, Part One, pp. 9–10, para. 28.

data, project and programme planning, or monitoring functions, as appropriate.

5. The prevention and mitigation of floods, droughts and other hazards, natural and man-made, are increasingly of concern to the co-operating States . . .; therefore new or strengthened activities must be undertaken to deal effectively with the detrimental effects of water-related hazards and conditions. The international river and lake organizations are appropriate bodies for initiating studies and recommending measures, contingency plans and warning systems, as well as for conducting the necessary ongoing review of conditions and the adequacy of measures undertaken.

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

. . .

8. Where continuing sectoral and intersectoral co-ordination between an international river or lake organization and the responsible national agencies is lacking, the former should be given authority to deal directly with the national agencies, individually or through the designated national entity. National agencies should fully co-operate with the joint or international organization.[765]

465. The final agenda item of the Meeting, topic III, "Economic and other considerations", also yielded relevant conclusions, such as:

3. Realization of joint international river basin projects involves a gradual process of well recognized steps requiring co-operation between basin States.

4. Both regional and integrated planning and execution of individual projects should proceed, but care should be taken in the latter so that they are compatible with, and do not preclude or obstruct, later joint projects and take into account the rights and obligations of neighbours.[766]

5. Authoritative opinion

466. The late James L. Brierly observed:

. . . The practice of States, as evidenced in the controversies which have arisen about this matter, seems now to admit that each State concerned has a right to have a river system considered as a whole, and to have its own interests weighed in the balance against those of other States; and that no one State may claim to use the waters in such a way to cause material injury to the interests of another, or to oppose their use by another State unless this causes material injury to itself.[767] This principle of the "equitable apportionment" of all the benefits of the river system between all the States concerned is clearly not a single problem which can be solved by the formulation of rules applicable to rivers in general; each river has its own problems and needs a system of rules and administration adapted to meet them. The way of advance seems therefore to lie, as Professor Smith suggests, in the constitution of authorities to administer the benefits of particular river systems.

467. The International Joint Commission, Canada-United States of America, after evaluating its own experience, commended to the 1981 Dakar Inter-regional Meeting a number of principles:

(a) *The provision of an ongoing, permanent joint Commission, within which there is absolute parity between countries in spite of the very significant disparity in the size of their populations and of their economies.* Thus Governments are assured that the Commission will provide a balanced forum within which issues can be resolved.

. . .

(c) *The development of a Commission structure, including the Commission's boards and reference groups, to provide a broad network within which a great deal of information can be exchanged formally and informally between Governments.* The structure provides a forum which encourages officials with similar responsibilities in both Governments to work together and to know one another . . . Likewise, they take back to their agencies perspectives and potential solutions gained through the board process, and they very often begin to develop programmes to deal with issues in their jurisdictions even before the Commission's final reports are made to the Governments

. . .

(d) *The development of a Commission process that permits the Governments to depoliticize issues that are difficult to resolve.* It often acts as a buffer between the two parties whose direct national interests cannot allow the impartial detachment which the Commission can provide. The process of joint fact-finding generally provides Governments with a common data base. This is of critical importance, since the dispute giving rise to a reference is often primarily a dispute over facts . . .

(e) *Provision of a mechanism which can alert Governments to matters of concern that may or may not be fully appreciated by Governments.* Thus the Commission plays a part in assisting Governments in the process of notice and consultation regarding proposed activities in one country which may have adverse impacts in the other country.[768]

6. Recent studies

468. Two comprehensive recent studies have been devoted to the administrative management of international water resources. One is the report of the United Nations Panel of Experts on the Legal and Institutional Aspects of International Water Resources Development, previously cited.[769] Designed as "a forward-looking consultation manual systematically setting forth and discussing the range of available legal and organizational alternatives",[770] it cites prior practice and prevailing doctrine. An excerpt from the work's closing findings may help to convey the significance of

[765] *Ibid.*, pp. 14–15, para. 49.

[766] *Ibid.*, p. 19, para. 69.

[767] J. L. Brierly, *The Law of Nations*, 5th ed. (Oxford, Clarendon Press, 1955), pp. 204–205. The reference is to H. A. Smith, *The Economic Uses of International Rivers*, *op. cit.*, a landmark work. The comparable passage in the latest edition of Brierly reads as follows: "The application of these general principles may well involve problems of considerable difficulty in individual cases . . . the exploitation of their water resources often calls for the most complex scientific studies and engineering techniques. In consequence, modern opinion considers it desirable that a State intending to undertake any new exploitation of its part of the river system should notify the other interested States . . . Furthermore, it is increasingly recognized that, for international rivers of any size, some form of joint international administration will almost certainly be needed if the resources of the river system are to be put to the fullest use for the benefit of all the riparian States . . ." (*ibid.*, 6th ed., H. Waldock, ed. (Oxford, Clarendon Press, 1963), pp. 232–233.

[768] "The International Joint Commission: Canada–United States" (United Nations, *Experiences in the Development and Management . . .*, p. 202). The Commission recognized "that instruments and institutions which have served Canada and the United States exceedingly well may not bring the same results in other countries. The mechanisms . . . may well have to be tailored to [the] particular needs [of other States or groups of States], their own perspectives, their own political or juridical procedures. Nevertheless, . . . the principles and structures . . . could serve as the corner-stone for other international accords. Coupled with the establishment of a permanent, impartial international agency to administer such accords, they could serve to address emerging and potential boundary water problems before they become matters of dispute. . . ." (*ibid.*).

[769] *United Nations, Management of International Water Resources . . .*

[770] *Ibid.*, p. iii (preface).

international watercourse organizations in the modern era:

557. . . . The recent agreements with respect to the Nile, the Indus, the Niger, the Senegal, the Plata, the Lower Mekong and the Yarmuk basins constitute serious attempts to realize mutual co-operation and collaboration for joint development and conservation of international water resources. These agreements, among others, reflect the growing acceptance of the principles of regional international planning for the achievement of interdependent national interests.

558. Mutual co-operation of riparian States . . . has in many cases led to a more efficient exploitation than otherwise would be possible. Investigation of the multiple-use potentials and the hydrological effects of water resources works considered in the context of the basin, rather than in the national context alone, has led to development schemes of significant net benefit to all States concerned. The exchange of hydrological and other data, the co-ordinated or joint construction and operation of projects such as dams and river training works and the sharing of the costs of such undertakings have been the subject matter of numerous successful international arrangements.

. . .

560. In international water resources systems, arrangements satisfactory to all countries concerned should respond to the totality of the circumstances, irrespective of the "accidental" occurrence of political boundaries. National interests will not be ignored, however, because they are manifestations of separate economic, cultural or political systems that have different water resources needs related to the particular stage of development and alternative sources of water or energy, as well as soil, mineral, climate and settlement patterns within each country. In many cases, unregulated exploitation of water by one country to its advantage turns out to be to the clear disadvantage of other countries.

561. Given these varying national circumstances and the individuality of each international water resources system, it remains for the co-system States to fashion the specific legal régime and institutional arrangements best suited to their purposes and capabilities. Existing international law and international institutional practice, however, are the proper points of departure . . .[771]

469. The other major study was undertaken by the Committee on International Water Resources Law of the International Law Association. In 1976, the Committee reported to the Association's Conference a set of draft articles on international water resources administration, which were approved by the Conference.[772] The articles, as approved, read as follows:

Article 1

As used in this chapter, the term "international water resources administration" refers to any form of institutional or other arrangement established by agreement among two or more basin States for the purpose of dealing with the conservation, development and utilization of the waters of an international drainage basin.

Article 2

1. With a view to implementing the principle of equitable utilization of the waters of an international drainage basin and consistent with the provisions of Chapter VI [of the Helsinki Rules] relating to the procedures for the prevention and settlement of disputes, the basin States concerned and interested should negotiate in order to reach agreement on the establishment of an international water resources administration.

2. The establishment of an international water resources administration in accordance with paragraph 1 above is without prejudice to the existence or subsequent designation of any joint agency, conciliation commission or tribunal formed or referred to by co-basin States pursuant to article XXXI [of the Helsinki Rules] in the case of a question or dispute relating to the present or future utilization of the waters of an international drainage basin.

Article 3

Member States of an international water resources administration in appropriate cases should invite other States, including non-basin States or international organizations, which by treaty, other instrument or binding custom enjoy a right to, or have an interest in, the use of the waters of an international drainage basin, to participate in the activities of the international water resources administration.

Article 4

1. In order to provide for an effective international water resources administration the agreement establishing that administration should expressly state, among other things, its objective or purpose, nature and composition, form and duration, legal status, area of operation, functions and powers, and financial implications of such an international water resources administration.

2. The Guidelines annexed to these articles should be taken into account when an international water resources administration is to be established.[773]

7. The proposed article

470. The inclusion of the foregoing material has had as its purpose to enhance awareness of the contemporary consequence of permanent institutions for the optimum exploitation and protection of international watercourses. It is not intended that the Commission consider for adoption any elaborate proposals on this aspect of the topic, since a general rule of international law obliging system States to conclude agreements establishing such entities has not been found to exist.[774] The Commission's article must, given the current state of the law, limit itself to a quite general proposition. Yet, as a leading student of the matter has correctly said:

. . . international administration is *necessary** in order to secure integrated development of international drainage basins, deciding on priorities among various projects, settlement of disputes, implementation of investment and reimbursement policies, allocation of benefits deriving from international water resources development and conservation activities, and for many other related aspects.[775]

471. Leaving the specifics to system agreements, the following draft article is proposed for possible consid-

[771] *Ibid.*, p. 175.

[772] ILA, *Report of the Fifty-seventh Conference*, . . ., p. xxxiv.

[773] *Ibid.*, p. xxxvii. For the Committee's report on this topic (part III, Rapporteur: D. A. Caponera), *ibid.*, pp. 239–266. In addition to an introduction, and a commentary to each draft article, the report includes a "List of agreements setting up a joint machinery for international drainage basin water resources management" by continent (*ibid.*, pp. 256–266). For the "Guidelines for the establishment of an international water resources administration" referred to in art. 4, para. 2, of the Association's articles, *ibid.*, pp. 253–256.

[774] For concurring views, see *inter alia* Caponera (*ibid.*, p. 246); C. B. Bourne, "Procedure in the development of international drainage basins", *University of Toronto Law Journal*, vol. 22, 1972, p. 172; F. Florio, "Sur l'utilisation des eaux non maritimes en droit international", *Festschrift für Friedrich Berber zum 75 Geburtstag* (Munich, Becksche, 1973), p. 151. The Helsinki Rules, while not taking up administration as a separate topic, only "recommend that the basin States refer" a question or dispute to a "joint agency" (art. XXXI, para. 1) (ILA, *Report of the Fifty-second Conference* . . ., p. 524); similarly, art. 2, para. 1, provides that the States concerned and interested *should* negotiate to that end (see para. 469 above).

[775] Caponera (ILA, *Report of the Fifty-third Conference, Buenos Aires, 1968* (London, 1969), p. 517 (session on water resources law)). See also L. Dávid, "River basin development for socio-economic growth: general report", United Nations, *River Basin Development* . . ., vol. I, p. 37: "The implementation of the river basin development process at a certain level of development requires a central organization to direct, control and co-ordinate all the activities concerning the development in order to reach its basic socio-economic goal. Therefore, it is proposed to organize river basin commissions for the large river basins. In the case of international river basins, these commissions could co-ordinate the water management activities of the basin countries having common interest".

eration by a successor Special Rapporteur and the Commission:

Article 15. Administrative management

At the request of any system State and where the economic and social needs of the region are making substantial or conflicting demands on water resources, or where the international watercourse system requires protection or control measures, the system States concerned shall enter into negotiations with a view to the establishment of permanent institutional machinery, or to the strengthening of any existing organization, for the purpose of expanding their consultations, of preparing or implementing their decisions taken with respect to the international watercourse system, and of promoting rational, optimum utilization, protection and control of their shared water resources.

E. Avoidance and settlement of disputes

472. While in recent years as a general rule the Commission has more often than not left questions of dispute settlement to the initiative as well as to the resolution of a conference of plenipotentiaries, it may in this case wish to consider the utility of including in its draft articles provisions on this question. It is so submitted for two reasons. First, the nature of the topic calls for measures of dispute settlement because resolution of differences in this sphere is often peculiarly urgent. The absence of such provisions may contribute to delay of important projects, suspension of expensive works under construction, postponement of critical pollution control programmes or inability to undertake measures to deal with very real hazards. Secondly, the result achieved in matters of dispute settlement in the United Nations Convention on the Law of the Sea in the analogous area of the law of the sea may perhaps give ground for hoping that provision for dispute settlement is politically feasible in respect of international watercourses.

1. Importance accorded to settlement of disputes

473. While "dispute settlement" is itself a large and traditional topic in international law, settlement of disputes over the use of international watercourses has long received unusually close attention by States and commentators. Numerous water-related disputes have in fact arisen over the years between system States.[776] Many of these have been resolved, finally, by formal proceedings, as well as by negotiated accommodations of differences.[777] A good number of these disputes have adversely affected or even embittered relations between the system States concerned, and for long periods of time. Some water disputes persist.[778] Owing

[776] It is accordingly not surprising that a considerable literature has appeared addressed to the dispute settlement aspect of international watercourse regulation. See, *inter alia*, Bourne, "Mediation, conciliation and adjudication in the settlement of international drainage basin disputes", *The Canadian Yearbook of International Law, 1971* (Vancouver), vol. ix, p. 114; J. G. Laylin and R. L. Bianchi, "The role of adjucidation in international river disputes: the Lake Lanoux case", *The American Journal of International Law*, vol. 53, 1959, p. 30; W. L. Griffin, "The use of waters of international drainage basins under customary international law", *ibid.*, p. 50; C. A. Colliard, "Evolution et aspects actuels du régime juridique des fleuves internationaux", *Recueil des cours de l'Académie de droit international de La Haye, 1968-III* (Leyden, Sijthoff, 1970), vol. 125, p. 343; G. Sauser-Hall, "L'utilisation industrielle des fleuves internationaux", *Recueil des cours . . ., 1953-II* (Leyden, Sijthoff, 1955), vol. 83, p. 471; J. Andrassy, "Les relations internationales de voisinage", *Recueil des cours . . ., 1951-II* (Paris, Sirey, 1952), vol. 79, p. 77; M. Wolfrom, *L'utilisation à des fins autres que la navigation dex eaux des fleuves, lacs et canaux internationaux* (Paris, Pedone, 1964); Smith, *op. cit.*; *The Law of International Drainage Basins* (*op. cit.*); J. Baines, "The diversion of international rivers", *The Indian Journal of International Law* (New Delhi), vol. I, No. 1, 1960, p. 38. Within federal systems, the resolution of disputes concerning interstate and inter-provincial rivers has also contributed to the development of applicable principles. See W. B. Cowles, "International law as applied between subdivisions of federations", *Recueil des cours . . ., 1949-I* Paris, Sirey, 1949), vol. 74, pp. 659–670, and cases cited therein; M. Huber "Ein Beitrag zur Lehre von der Gebietshoheit an Grenzflussen", *Zeitschrift für Völkerrect und Bundesstaatsrecht* (Breslau), vol. 1, 1907, pp. 34–35; J. Friedrich, "The settlement of disputes between States concerning rights to the waters of interstate streams", *Iowa Law Review* (Iowa City), vol. 32, 1946–1947, p. 244; W. Van Alstyne, "International law and interstate river disputes", *California Law Review* (Berkeley, Calif.), vol. XLVIII, 1960, p. 596; E. W. Clyde, "Colorado River decision—1963 (*Arizona* v. *California*)", *Utah Law Review* (Salt Lake City), vol. 8, 1963–1964, p. 299; C. Meyers, "The Colorado Basin", *The Law of International Drainage Basins* (*op. cit.*), p. 504.

[777] See e.g. *Diversion of water from the Meuse, Judgement, 1937* [Belgium v. Netherlands], *P.C.I.J., Series A/B, No. 70*, p. 4; *Territorial jurisdiction of the International Commission of the River Oder, Judgement No. 16, 1929* [Czechoslovakia, Denmark, France, Germany and Sweden v. Poland], *P.C.I.J., Series A, No. 23; Jurisdiction of the European Commission of the Danube, Advisory Opinion, 1927, P.C.I.J., Series B, No. 14.* For arbitral awards, see the *Lake Lanoux* case (1957) (Spain–France) (United Nations, *Reports of International Arbitral Awards*, vol. XII . . ., p. 285, and *International Law Reports, 1957* (London, 1961), p. 101); the *Helmand River Delta* case, awards of 1872 and 1905 (*Helmand River Delta Commission, Afghanistan and Iran* (report of the Commission) (Washington, D.C., Feb. 1951), and *Yearbook . . . 1974*, vol. II (Part Two), pp. 188–190, document A/5409, paras. 1034–1037, and works there cited); the *San Juan River* case (1888) (Costa Rica—Nicaragua) (J. B. Moore, *History and Digest of International Arbitrations to which the United States has been a Party*, (Washington, D.C., U.S. Government Printing Office, 1898), vol. II, p. 1964, and *Yearbook . . . 1974*, vol. II (Part Two), document A/5409, pp. 190–191, paras. 138–141, and works there cited); the *Kushk River* case (1893) (United Kingdom–Russia) (C. U. Aitchison, *A Collection of Treaties, Engagements and Sanads relating to India and Neighbouring Countries* (Calcutta, vol. XIII, p. 253, and *Yearbook . . . 1974*, vol. II (Part Two), pp. 191–192, document A/5409, paras. 1042–1046); the *Zarumilla River* case (1945) (Peru-Ecuador) (*British and Foreign State Papers, 1943–1945* (London), vol. 145, 1953, p. 566). See also the analogous *Trail Smelter* case (awards of 1938 and 1941 (United States of America–Canada) (United Nations, *Reports of International Arbitral Awards*, vol. III (Sales No. 1949.V.2), p. 1905).

[778] Many studies exist on specific disputes or questions relating to specific regions. See e.g. S. Agrawal, "Legal aspects of the Indo-Pakistan water dispute", *The Supreme Court Journal* (Madras), vol. XXI, Jan. 1958, p. 157; T. Armstrong *et al.*, "The Columbia River dispute", *Osgoode Hall Law Journal* (Downsview, Ont.), vol. 1, 1958, p. 1; J. S. Bains, *India's International Disputes* (London, Asia Publishing House, 1962); Berber, "The Indus water dispute", *The Indian Yearbook of International Affairs, 1957* (Madras), vol. VI, p. 46; A. Blondeau, *L'Escaut, fleuve international et le conflit hollando-belge* (Paris, Sirey, 1932); Bolivia, Ministry for Foreign Affairs, *La desviación del río Lauca, antecedentes y documentos* (La Paz, 1962); Chile, Ministry for Foreign Affairs, *La cuestión de río Lauca* (Santiago, Instituto Geográfico Militar, 1963); Bourne, "The Columbia River controversy", *The Canadian Bar Review* (Ottawa), vol. XXXVII, No. 2, 1959, p. 444; Cohen, "Some legal and political aspects of the Columbia River dispute", *ibid.*, vol. XXXVI, No. 1, 1958, p. 25; N. Chiesa, "Las controversias fronterizas entre Argentina y Uruguay y el último tratado de límites", *Revista de derecho internacional y ciencias diplomáticas* (Rosario), vol. VIII, No. 19/20, 1961, p. 125; F. Dehousse, "L'affaire des eaux de la Meuse: les faits de la cause", *Revue de droit international* (Paris), vol. XIX, No. 1, 1937, p. 177; K. Doherty, *Jordan Waters Conflict* (New York, Carnegie Endowment for International Peace, 1965); F. Duléry, "L'affaire du lac Lanoux", *Revue générale de droit international public* (Paris), 3rd series, vol. XXIX, No. 3, 1958, p. 469; A. Gervais, "L'affaire du lac Lanoux", *Annuaire français de droit international, 1960* (Paris), vol. VI, p. 372; P. Guggenheim, "L'affaire de l'usine

(*Continued on next page*)

to the severity of these experiences, and the growing awareness of the need to maximize the contributions of their shared waters to development efforts, a number of those States and others have been induced to enter into agreements intended to facilitate the resolution of differences, including those concerning international watercourses.[779] Some international watercourses, however, are still not covered by such arrangements for the settlement of disputes, and not a few of these agreements fail to provide procedures that ensure prompt and effective resolution.[780]

2. Accommodation in lieu of dispute

474. In any event, it is now appreciated that it is as important to build into the institutional relationships between or among system States the opportunity and procedures for avoidance of conflict as it is to bring an arbitral or other procedure for the settlement of disputes into force among them. With the eventual revision and completion of these draft articles by the Commission, and their subsequent disposition, and with the wider creation or strengthening by agreement of joint or international machinery for administrative management of shared water resources, the legal and institutional framework should be in place for the readier composition of differences and, where still necessary, the submission of unresolved disputes to arbitration or adjudication, in reliance upon the conventional law applicable to the parties and the principles and rules of general international law.[781]

475. Long-range benefits accrue to all interested States when procedures are accepted

that preserve the ability to maintain the momentum of data collection and exchange, survey preparation, programme and project planning and execution, and operational and regulatory activities. Successful accommodation or early settlement avoids work stoppages, strained relations and, most important, the hardening of the national position that inevitably occurs once a difference emerges as a full-fledged dispute.[782]

476. A review of differences that arise between system States may first be made by experts fully familiar with the situation at issue. Beginning the consideration at the technical level has been recommended

because professionally qualified and experienced officers who are dealing on a day-to-day basis with international water resources problems and with their professional counterparts are in the best position to marshal and evaluate the extensive and complex factual data and to weigh the scientific, engineering and management considerations . . . Moreover, the influence of extraneous considerations, including political considerations where these are unrelated to the problem at hand, can best be minimized when substantial decision-making authority is delegated, at least in the first instance, to the experts directly involved. The need for review of contested technical-level decisions and for ultimate resolution at the higher level should not be overlooked, but every effort should be made to promote the resolution of differences by the provision of competent accommodation machinery at the operating level. In this way, work on international water resources projects or programmes is least likely to be delayed or disrupted and the merits of the matter least likely to be distorted or misconstrued.[783]

477. In this connection, the development of an objective data base for the problem

may serve to allay the apprehension [of a system State] or may show the apprehension to be well founded. Full study of the problem on the basis of all the information may cause one side or the other to give ground or propose some solution that will resolve the differences.[784]

3. Utility of several "echelons"

478. When an accommodation is not achieved at the operating level, a review at a higher level must take place. This review can still be by water resources professionals, such as the members, or deputies, of the system States' international watercourse commission. Such arrangements are not uncommon in current system State practice.[785]

479. An additional "professional" review may be obtained by reference of the question to a technical commission of inquiry.[786] A notable example of this method to promote the resolution of differences is found in the Indus Waters Treaty of 1960 between India and Pakistan. There the services of a "neutral

(*Footnote 778 continued*)

électrique de Rheinau", *Annuaire suisse de droit international, 1953* (Zurich), vol. X, p. 193; W. Hall, "Indus waters dispute", *Foreign Agriculture* (Washington, D.C.), vol. XXIII, No. 11, 1959, p. 17; A. Hirsch, "From the Indus to the Jordan—characteristics of Middle East international river disputes", *Political Science Quarterly* (New York), vol. LXXI, No. 2, 1956, p. 203; M. G. Ionides, "The disputed waters of Jordan", *The Middle East Journal* (Washington, D.C.), vol. 7, No. 2, 1953, p. 153; F. Khouri, "The Jordan River controversy", *The Review of Politics* (Notre Dame, Ind.), vol. 27, No. 1, 1965, p. 32; L. M. Lecaros, "International rivers—the Lauca case", *The Indian Journal of International Law* (New Delhi), vol. 3, No. 2, 1963, p. 133; Johnson, "The Columbia Basin", *loc. cit.*, p. 186; Baxter, "The Indus Basin", *loc. cit.*, p. 449; D. Piper, "A justiciable controversy concerning water rights", *The American Journal of International Law*, vol. 56, 1962, p. 1019; V. Radovanovitch, "Le Danube maritime et le règlement du différend relatif aux compétences de la Commission européenne sur le secteur Galatz-Braïla", *Revue de droit international et de législation comparée* (Brussels), 3rd series, vol. XIII, No. 3, 1932, p. 546; J. Rojas Garcidueñas, "Caso internacional de la salinidad de las aguas entregadas a México en el río Colorado", *Revista de la Facultad de derecho de México* (Mexico City), vol. XIV, 1964, p. 443; C. Sepúlveda, "Areas of dispute in Mexican-American relations", *Southwestern Law Journal* (Dallas, Tex.), vol. 17, 1963, p. 98.

[779] For a digest and analysis of most such agreements, see B. Clagett, "Survey of agreements providing for third-party resolution of international waters disputes", *The American Journal of International Law*, vol. 55, 1961, p. 645.

[780] For reservations, qualifications and absence or inadequacy of provisions for constituting or designating the tribunal, as well as for the question whether certain agreements are still in effect, *ibid.*, pp. 648–668.

[781] United Nations, *Management of International Water Resources . . .*, pp. 179–180, paras. 576–580; Hayton, "Progress in co-operative arrangements", *loc. cit.*, p. 65.

[782] United Nations, *Management of International Water Resources . . .*, p. 144, chap. V, "Accommodation procedures and dispute settlement", para. 455.

[783] *Ibid.*, pp. 144–145, para. 457. "Even resolution of differences at the technical level may call for alternative approaches and more than one stage, or echelon, depending upon the circumstances . . ."

[784] *Ibid.*, p. 145, para. 458. "If, under the basin or system agreement, a procedure of mutual consultation is required . . . before positions have hardened unduly, there will ordinarily be greater opportunity for the professional people to persuade one another of the validity of a particular reading of the data and of the preferability of one course of action over another. It should be made certain that at this initial stage a thorough, modern interdisciplinary examination occurs and that the breadth and depth of the data supplied are sufficient for this purpose" (*ibid.*, para. 460).

[785] For example, such authority is delegated to the Mixed Supervisory Commission established by art. VI of the 1955 Convention between Italy and Swizerland concerning the regulations of Lake Lugano (United Nations, *Treaty Series*, vol. 291, p. 222). See also the review relationship between the Frontier Water Commission and the Supreme Frontier Water Commission provided in the Statutes annexed to the Treaty between Denmark and Germany of 1922 (League of Nations, *Treaty Series*, vol. X, pp. 237–243, paras. 20–37 and 43–46).

[786] This alternative is explored in United Nations, *Management of International Water Resources . . .*, pp. 147–148, paras. 464–465.

expert" may be called in by either of the Commissioners.[787] As a further device to forestall the matter's hardening into a formal dispute between the parties, one or more additional "echelons" of review may be built into the arrangements of the system States, such as a diplomatic mission especially constituted for the purpose.[788] System States have, in particular agreements, employed a variety of accommodation mechanisms. Belgium and Germany combined diplomatic and technical representation in one joint administrative commission for the purpose of accommodating differences.[789] Such a separate forum could be designated to function prior to the traditional "referral to the Governments", which may mean that the matter will then become a formal dispute.[790]

4. Formal alternatives for the settlement of disputes

480. After "referral to the Governments" of any difference that has not been resolved by the institutional machinery set up by the system States for the handling of their shared water resources affairs, the usual next step is direct negotiation between the parties at the political level. The project or programme at issue may be of such importance that even at this stage it may be prudent for the system States to arrange for some or all operations to continue, pending final resolution of the matter.[791]

481. Failing settlement by high-level negotiation, the parties are, of course, free to take the dispute to the International Court of Justice. The Court may in appropriate circumstances indicate provisional measures, which could serve the parties' interests in avoiding delay or disruption of critical water-related activities, or preclude irreversible harm. The parties are also free to refer the matter for adjudication to any other appropriate tribunal (see Article 95 of the Charter on the United Nations).[792]

482. The fundamental requirement, in accordance with Article 33, paragraph 1, of the Charter and the rules of contemporary international law, is settlement by peaceful means. In addition to resolution by means of negotiation, inquiry and adjudication, the parties may choose, among other peaceful means, conciliation, arbitration or the assistance of regional agencies or arrangements. While each of these familiar means need not be examined in this report, abbreviated reference to current aspects of conciliation and arbitration may prove helpful in considering the scope of a residual rule which the Commission may consider for its draft articles on the topic.

5. Conciliation and arbitration

483. The Third United Nations Conference on the Law of the Sea devoted much time and effort to the consideration of appropriate arrangements for the settlement of disputes, and those arrangements are now embodied in the United Nations Convention on the Law of the Sea.[793] The approaches and considerations embodied in that instrument are instructive. Part XI of the Convention, "The Area" (beyond the limits of national jurisdiction), contains its own section on "Settlement of disputes and advisory opinions";[794] part XIII, "Marine scientific research" also has a separate section on "Settlement of disputes and interim measures".[795] For the Convention as a whole, part XV sets out 21 articles on settlement of disputes in three sections.[796] Supplementing these main articles are four annexes: annex V, "Conciliation"; annex VI, "Statute of the International Tribunal for the Law of the Sea"; annex VII, "Arbitration"; and annex VIII, "Special arbitration". In short, the obligations and procedures of peaceful settlement deemed to be needed for the Law of the Sea are complex and extensive.

484. The procedure for "conciliation", under annex V of the Convention, operates in the first instance under article 284, "Conciliation", of the Convention. That article provides, in paragraph 1:

> A State party which is a party to a dispute concerning the interpretation or application of this Convention may invite the other party or parties to submit the dispute to conciliation. . . .

The parties may choose the procedure set out in sect. 1 of annex V, or some other conciliation procedure. Resort to conciliation is voluntary, but once the dispute has been submitted, the procedure shall be deemed terminated only

> when a settlement has been reached, when the parties have accepted or one party has rejected the recommendations of the report . . . or when a period of three months has expired from the date of transmission of the report to the parties.[797]

485. Under section 2 of annex V, on conciliation, the procedure is to become compulsory under certain circumstances, as provided in article 297, paragraph 3 (*b*), of the Convention:

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[787] Detailed provisions, including provisions with respect to appointment, hearing, remuneration etc. are contained in annex F of the Treaty (United Nations, *Treaty Series*, vol. 419, p. 202). Concerning the Österreichisch-Bayerische Kraftwerke AG, Austria and the Free State of Bavaria agreed in 1950 that the "Governments shall call upon an internationally recognized expert to act as a mediator" if the two States are not able to resolve a difference by negotiation "on an important company matter" (Art. 10) (United Nations, *Legislative Texts . . .*, p. 472).

[788] See United Nations, *Management of International Water Resources . . .*, p. 154, para. 486.

[789] Art. 94 of the 1929 Frontier Agreement between Germany and Belgium (League of Nations, *Treaty Series*, vol. CXXI, p. 378).

[790] Such a "last resort" commission, before referral to the Governments as a dispute, is provided for in the 1955 Agreement between Yugoslavia and Hungary (art. 10) (United Nations, *Legislative Texts . . .*, p. 834).

[791] See art. 25, para. (2), of the 1952 Agreement between Austria and the Federal Republic of Germany and the Free State of Bavaria concerning the Donaukraftwerk-Jochenstein Aktiengesellschaft, under which the arbitral tribunal provided for shall, "at the request of either side, make arrangements for the continued operation of the undertaking as a whole which take into account the interests of the contracting parties" under specified circumstances (*ibid.*, p. 483).

[792] Moreover, pursuant to Article 35 of the Charter, any State may bring a dispute to the attention of the Security Council or the General Assembly. The option of "basin or regional courts" is discussed in United Nations, *Management of International Water Resources . . .*, pp. 157–159, paras. 494–498.

[793] Official Records of the Third United Nations Conference on the Law of the Sea, vol. XVII, document A/CONF.62/122.

[794] Sect. 5, arts. 186–191.

[795] Sect. 6, arts. 264 and 265.

[796] Sect. 1, "General provisions" arts. 279–285; sect. 2, "Compulsory procedures entailing binding decisions", arts. 286–296; sect. 3, "Limitations and exceptions to applicability of section 2", arts. 297–299.

[797] Annex V, art. 8.

Where no settlement has been reached by recourse to section 1 of this part [articles 279–283, chiefly the obligation to settle by peaceful means chosen by the parties, to exchange views, or to refer the dispute under binding general, regional or special agreements], a dispute shall be submitted to conciliation . . ., at the request of any party to the dispute, when it is alleged that:

(i) a coastal State has manifestly failed to comply with its obligations to ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not seriously endangered;

(ii) a coastal State has arbitrarily refused to determine, at the request of another State, the allowable catch and its capacity to harvest living resources with respect to the stocks which that other State is interested in fishing; or

(iii) a coastal State has arbitrarily refused to allocate to any State, under [specified provisions] . . ., the whole or part of the surplus it has declared to exist.

The possibility of adapting provisions such as these to the field of international watercourses may merit consideration.[798]

486. The United Nations Convention on the Law of the Sea also provides instructive provisions for compulsory adjudication or arbitration of certain disputes. Article 1 of annex VII provides for a detailed procedure, available to any party to a dispute, "by written notification addressed to the other party or parties to the dispute".[799]

6. Non-maritime international waters and settlement of disputes

487. The procedures, including adjudication and arbitration, provided for in the United Nations Convention on the Law of the Sea, are too complex to analyse in this report; however, its emphasis on settlement of disputes, and the great efforts made to bring maritime waters disputes under some fruitful procedure of peaceful settlement, are clear. The affairs of system States in relation to their no less vital international watercourses would seem to merit substantial, if not equally elaborate, attention in view of the eventuality of controversies that cannot be resolved bilaterally.[800] Pollution and environmental protection problems have emerged as sensitive and difficult matters in connection with shared non-maritime as well as maritime water resources; peaceful resolution of system-State controversy in this area will tax the best machinery for the settlement of disputes.[801]

488. A decision as to whether a use has to be curtailed, a programme of control or protection instituted, or compensation paid, have become matters of great import and can set into motion often protracted and estranging negotiations between the system States concerned. So important are the development, use, protection and control of shared water resources, and so potentially damaging to friendly relations are the disputes in this field, that many States understand the need for effective dispute settlement machinery for the resolution of conflicts over shared water resources. It would appear that non-negotiable impasses as well as dilatory tactics are perceived, at least in principle, as contrary to the long-run interests of all.

489. The development to date of international law allows disputing States virtually unlimited freedom of choice of means of dispute settlement, failing prior agreement, limited only by the requirement that all means be peaceful. But the time consumed by the preliminary negotiations normally necessary merely to achieve agreement on the means can itself be injurious to the development of the system States or augment the harm being inflicted upon one or more system States. The challenge is, consequently, to draft an article on avoidance or settlement of disputes that avails itself of the widespread recognition among States of the special needs in this field of the non-navigational uses of international watercourses, without overstepping the bounds of the politically feasible.

7. The work of the Institute of International Law

490. The Instute of International Law, at its 1979 Athens session, devoted to "the pollution of rivers and lakes and international law", did not venture far into the matter of dispute settlement, but it emphasized in its resolution the necessity for co-operation among the States concerned, as well as pollution prevention, and for international conventions dealing with "the procedure for special arrangements providing in particular for objective liability systems and compensation funds with regard to pollution brought about by ultra-hazardous activities".[802] The Institute also made it a duty of States, "as far as practicable" and "especially through agreements", to

consult with each other on actual or potential problems of transboundary pollution of the basin so as to reach, by methods of their own choice, a solution consistent with the interests of the States concerned and with the protection of the environment;[803]

491. In its "Salzburg resolution" of 1961, the Institute had recognized as a rule of international law that "the States will enter into negotiations with a view to reaching an agreement within a reasonable time", in

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[798] See generally Bourne, "Meditation, conciliation and adjudication in the settlement of international drainage basin disputes", *loc. cit.*

[799] Institution of proceedings under annex VII is subject to the provisions of part XV of the Convention, which includes the conciliation provisions and allows the contracting parties to choose, by written declaration, one or more compulsory procedures entailing binding decisions, namely, the International Tribunal for the Law of the Sea (established in accordance with annex VI); the International Court of Justice; an arbitral tribunal constituted in accordance with annex VII; and a special arbitral tribunal constituted in accordance with annex VIII (for one or more of the categories of disputes specified therein) (sect. 2, art. 287, para. 1). Limitations and exceptions to the applicability of the compulsory procedures are spelled out in sect. 3 (arts. 297–299).

[800] The International Tribunal for the Law of the Sea and its Sea-Bed Disputes Chamber established by the Convention are not discussed in this report. But see the Statute of the International Tribunal for the Law of the Sea, (annex VI), and sect. 5 of part XI of the Convention (arts. 186–191) on the Sea-Bed Disputes Chamber.

[801] See *inter alia* R. Bilder, *The Settlement of International Environmental Disputes* (Madison, University of Wisconsin, 1976); Bourne, "Procedure in the development of international drainage basins: the duty to consult and to negotiate", *The Canadian Yearbook of International Law, 1972* (Vancouver), vol. X, p. 212; L. Teclaff, "The impact of environmental concern on the development of international law", *Natural Resources Journal*, vol. 13, 1973, p. 357, and "Harmonizing water use and development with environmental protection", *ibid.*, vol. 16, 1976, p. 807.

[802] Art. VI, para. (*b*) (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 199).

[803] Art. VII, para. (*d*) (*ibid.*, p. 201).

case objection were made to works or utilizations undertaken.[804]

A recommendation follows that rule:

For this purpose, it is desirable that the States in disagreement should have recourse to technical experts and, should occasion arise, to commissions and appropriate agencies in order to arrive at solutions assuring the greatest advantage to all concerned.[805]

492. The following articles are more specific:

Article 7

During the negotiations, every State must, in conformity with the principle of good faith, refrain from undertaking the works or utilizations which are the object of the dispute or from taking any other measures which might aggravate the dispute or render agreement more difficult.

Article 8

If the interested States fail to reach agreement within a reasonable time, it is recommended that they submit to judicial settlement or arbitration the question whether the project is contrary to the above rules.

If the State objecting to the works or utilizations projected refuses to submit to judicial settlement or arbitration, the other State is free, subject to its responsibility, to go ahead while remaining bound to its obligations rising from the provisions of articles 2 to 4.[806]

493. The final article of the resolution recommends investigation of the desirability of "common organs", *inter alia* "to prevent and settle disputes which might arise".[807]

4. Settlement of disputes in the Helsinki Rules

494. The International Law Association, for its part, devotes a lengthy chapter to this subject in its Helsinki Rules, with particular attention to prevention of disputes.[808] The relevant rules may profitably be studied:[809]

[804] Resolution on "Utilization of non-maritime international waters (except for navigation)", art. 6, first para. (*ibid.*, *1961*, vol. 49, Part Two, p. 383; reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 202, document A/5409, para. 1076).

[805] Art. 6, second para. (*Annuaire de l'Institut de droit international, 1961*, vol. 49, Part Two, p. 383).

[806] *Ibid.* Art. 2 states that the right to utilize is limited by the right of utilization of other States; art. 3 states that, if there is disagreement over the scope of their rights, settlement will take place on the basis of equity; art. 4 states that no State can undertake works or utilizations which seriously affect the possibility of utilization by other States except on condition of assuring them the enjoyment of advantages to which they are entitled under art. 3, as well as adequate compensation for any loss or damage.

[807] Art. 9 (*ibid.*, p. 385). For a view comparable to that of the Institute, see E. Jiménez de Aréchaga, "International legal rules governing use of waters from international watercourses", *Inter-American Law Review* (New Orleans, La.), vol. II, No. 2, 1960, p. 328; see also, by the same author, "International law in the past third of a century", *Recueil des cours . . ., 1978–I* (Aalphen aan den Rijn, Sijthoff and Noordhoff, 1979), vol. 159, pp. 199–200.

[808] Chap. 6, "Procedures for the prevention and settlement of disputes", arts. XXVI–XXXVII, and annex, "Model rules for the constitution of the conciliation commission for the settlement of a dispute" (ILA, *Report of the Fifty-second Conference . . .*, pp. 516–532). This portion of the Helsinki Rules was prepared by a working group headed by the late Richard R. Baxter.

[809] Each article is followed by substantial commentary, not adopted by the International Law Association Conference but reproduced in its report. The comment under art. XXXV refers to and recommends the "Model rules on arbitral procedure" contained in the report of the International Law Commission on the work of its tenth session (*Yearbook . . . 1958*, vol. II, 83–86, document A/3859, para. 22) and commended by the General Assembly to the attention of Members for adoption in appropriate cases (General Assembly resolution 1262 (XIII) of 14 November 1958).

CHAPTER 6
PROCEDURES FOR THE PREVENTION AND SETTLEMENT OF DISPUTES

Article XXVI

This chapter relates to procedures for the prevention and settlement of international disputes as to the legal rights or other interests of basin States and of other States in the waters of an international drainage basin.

Article XXVII

1. Consistently with the Charter of the United Nations, States are under an obligation to settle international disputes as to their legal rights or other interests by peaceful means in such a manner that international peace and security, and justice are not endangered.

2. It is recommended that States resort progressively to the means of prevention and settlement of disputes stipulated in articles XXIX to XXXIV of this chapter.

Article XXVIII

1. States are under a primary obligation to resort to means of prevention and settlement of disputes stipulated in the applicable treaties binding upon them.

2. States are limited to the means of prevention and settlement of disputes stipulated in treaties binding upon them only to the extent provided by the applicable treaties.

Article XXIX

1. With a view to preventing disputes from arising between basin States as to their legal rights or other interest, it is recommended that each basin State furnish relevant and reasonably available information to the other basin States concerning the waters of a drainage basin within its territory and its use of, and activities with respect to such waters.

2. A State, regardless of its location in a drainage basin, should in particular furnish to any other basin State, the interests of which may be substantially affected, notice of any proposed construction or installation which would alter the régime of the basin in a way which might give rise to a dispute as defined in article XXVI. The notice should include such essential facts as will permit the recipient to make an assessment of the probable effect of the proposed alteration.

3. A State providing the notice referred to in paragraph 2 of this article should afford to the recipient a reasonable period of time to make an assessment of the probable effect of the proposed construction or installation and to submit its views thereon to the State furnishing the notice.

4. If a State has failed to give the notice referred to in paragraph 2 of this article, the alteration by the State in the régime of the drainage basin shall not be given the weight normally accorded to temporal priority in use in the event of a determination of what is a reasonable and equitable share of the waters of the basin.

Article XXX

In case of a dispute between States as to their legal rights or other interests, as defined in article XXVI, they should seek a solution by negotiation.

Article XXXI

1. If a question or dispute arises which relates to the present or future utilization of the waters of an international drainage basin, it is recommended that the basin States refer the question or dispute to a joint agency and that they request the agency to survey the international drainage basin and to formulate plans or recommendations for the fullest and most efficient use thereof in the interests of all such States.

2. It is recommended that the joint agency be instructed to

submit reports on all matters within its competence to the appropriate authorities of the member States concerned.

3. It is recommended that the member States of the joint agency in appropriate cases invite non-basin States which by treaty enjoy a right in the use of the waters of an international drainage basin to associate themselves with the work of the joint agency or that they be permitted to appear before the agency.

Article XXXII

If a question or a dispute is one which is considered by the States concerned to be incapable of resolution in the manner set forth in article XXXI, it is recommended that they seek the good offices, or jointly request the mediation of a third State, of a qualified international organization or of a qualified person.

Article XXXIII

1. If the States concerned have not been able to resolve their dispute through negotiation or have been unable to agree on the measures described in articles XXXI and XXXII, it is recommended that they form a commission of inquiry or an *ad hoc* conciliation commission, which shall endeavour to find a solution, likely to be accepted by the States concerned, of any dispute as to their legal rights.

2. It is recommended that the conciliation commission be constituted in the manner set forth in the annex.

Article XXXIV

It is recommended that the States concerned agree to submit their legal disputes to an *ad hoc* arbitral tribunal, to a permanent arbitral tribunal or to the International Court of Justice if:

(*a*) A commission has not been formed as provided in article XXXIII, or

(*b*) The commission has not been able to find a solution to be recommended, or

(*c*) A solution recommended has not been accepted by the States concerned, and

(*d*) An agreement has not been otherwise arrived at.

Article XXXV

It is recommended that in the event of arbitration the States concerned have recourse to the Model rules on arbitral procedure prepared by the International Law Commission of the United Nations at its tenth session in 1958.

Article XXXVI

Recourse to arbitration implies the undertaking by the States concerned to consider the award to be given as final and to submit in good faith to its execution.

Article XXXVII

The means of settlement referred to in the preceding articles of this chapter are without prejudice to the utilization of means of settlement recommended to, or required of, members of regional arrangements or agencies and of other international organizations.

9. Data sharing and avoidance of disputes

495. It may be noted that the Helsinki Rules related the giving of "notice of any proposed construction or installation which would alter the régime . . ." to situations "which might give rise to a dispute . . ."[810] Similarly, the furnishing of "relevant and reasonably available information" is set forth in the context of prevention of disputes.[811] In this report, however, the Commission is urged to treat notice and information requirements as part of customary, continuing co-operation between system States, above all in fulfilment of their obligation to avoid appreciable harm (see chap. II, sect. D, above). It is believed that, when system States so co-operate fully, disputes are less likely to arise.

496. In the process of working out technical adjustments, where needed, to proposed projects and programmes, and in arriving at substantive determinations of equitable participation, procedures for the avoidance of disputes become invaluable to the system States. Failure of dispute avoidance machinery means that the differences are likely to harden into formal disputes, thus invoking the parties' dispute settlement arrangements, if any. And failure to comply with the duties of notice and data sharing could itself lead to a dispute. Therefore, emphasis is placed in this section of the report on the need for system States to endeavour to accommodate and adjust. If such efforts fail, willing resort to an efficient dispute settlement forum is of the essence.

10. The proposed article: minimal provisions

497. While the Special Rapporteur is sympathetic to the more far-reaching proposals of the Institute of International Law and the International Law Association, he wishes to suggest no more at this juncture than he believes existing international law requires. The draft article which is tentatively formulated is far less elaborate than the cited articles of the United Nations Convention on the Law of the Sea, but it shares with those articles a sense of urgency in respect of settlement of disputes involving critical natural resources.

498. The hardening of differences into international disputes is highly undesirable. Yet once a dispute has crystallized, international law—most notably, the Charter of the United Nations (Article 2, para. 3, and Article 33)—requires its settlement by peaceful means, if continuance of the dispute is likely to endanger the maintenance of international peace and security (a condition which disputes over international watercourses too often can fulfil). Moreover, the Security Council may investigate "any dispute, or any situation which might lead to international friction or give rise to a dispute . . ." (Article 34). In the light of these provisions, and the considerations set forth in this section, the following draft article, which is believed to be consonant with State practice and the Charter, is offered for the consideration of a successor Special Rapporteur and of the Commission. It would apply in the absence of means more satisfactory to, or binding upon, the parties.[812] It reads as follows:

Article 16. Principles and procedures for the avoidance and settlement of disputes

1. System States are under a duty to settle disputes concerning the development, use, protection or control of their shared water resources by peaceful means that do not endanger international peace and security, and justice.

[810] Art. XXIX, para. 2.

[811] Art. XXIX, para. 1.

[812] The annexes called for in the suggested draft article have not been prepared at this preliminary stage.

2. In the absence of applicable agreement between the system States concerned for the resolution of differences and the settlement of disputes concerning an international watercourse system, such differences and disputes are governed by the rules and principles of these articles and by the following:

(*a*) A planned or intended use in the future of system water by one or more system States shall not be ground for denying a right of reasonable and beneficial use in the present to another system State.

(*b*) Pending a determination of equitable use, a system State is not obliged to suspend an existing beneficial use, except by agreement, unless the use is causing or will cause appreciable harm to another system State or to the environment. In the event that appreciable harm is caused, failure to modify the use, to suspend the use, or otherwise to abate the cause of the appreciable harm at the request of another system State subjects the offending system State to liability for damages and denial of the use right.

(*c*) Conflicting use of an international watercourse system will be made compatible, at the request of a system State affected by the conflict, by restricting one or more of the uses, or by making adjustments to the régime of the system, to the degree necessary and in a manner calculated to produce the minimum practical loss of total utilization; more valuable uses will be given preference where other considerations are determined not to be paramount.

(*d*) Where the difference between the system States involves the development, protection or control of the international watercourse system, the above principles, *mutatis mutandis*, shall apply.

3. System States shall use their best efforts to adjust their differences regarding the development, use, protection or control of their shared water resources with the view to avoiding the emergence of disputes.

4. Unless the system States concerned otherwise agree,

(*a*) failure after a reasonable period of consultation and negotiations to reach an accommodation of a difference between system States regarding the development, use, protection or control of an international watercourse system entitles any of the system States concerned to call for the creation of an international commission of inquiry to investigate and report upon the facts relevant to the unresolved difference;

(*b*) any system State concerned is, after the call for creation of an international commission of inquiry, entitled to convoke a special period of intensified negotiations not to exceed six months measured from the date of the call for the said commission, during which time the formation of the said commission shall be held in abeyance;

(*c*) international commissions of inquiry shall be constituted in accordance with this article and the procedures annexed to these articles at the instance of any system State concerned;

(*d*) upon receipt of the report of an international commission of inquiry, the system States concerned shall renew their negotiations and, with the said report as a basis, endeavour to arrive at a just and equitable resolution of the difference;

(*e*) in the event that resolution of the difference by negotiation is not attained within six months after receipt by the system States concerned of the report of the international commission of inquiry, or the formation or work of said commission has been frustrated so that its report is not rendered, any system State concerned may thereafter refer the matter to conciliation in accordance with the procedure annexed to these articles;

(*f*) in the event that, with the assistance of conciliation, the system States concerned fail to resolve the difference within a reasonable time, any system State concerned may, after notice to all system States concerned and thereafter waiting a minimum of ninety days, declare the matter to be an international dispute and call for arbitration or adjudication of the dispute in accordance with the optional procedures annexed to these articles. This subparagraph shall not be operative where the system States concerned have an applicable mutually binding agreement to arbitrate or adjudicate disputes.

F. Concluding observations

499. In these concluding paragraphs of his final report, the Special Rapporteur wishes to offer the following observations in the hope that they may be found useful in future work of the Commission on the topic.

1. Functions of these draft articles

500. The Special Rapporteur's reports envisage the draft articles to be formulated by the Commission as a set of principles and rules fulfilling these functions:

(*a*) Codification and, to a certain extent, progressive development of international law on the subject;

(*b*) To that end, the settling of "residual" principles and rules to govern those elements of international watercourse law (except for navigational uses) which are not covered, or not dealt with comprehensively, by international agreements in force;

(*c*) Provision of principles and foundations for the promotion and conclusion of agreements among system States governing their relations in respect of a specific international watercourse system, or some portion or aspect of their shared water resources;

(*d*) Assisting in the interpretation of provisions, and of terms of art used in provisions, of system agreements.

501. The draft articles adopted or proposed are believed to represent codification of existing principles, and they embody a minimal measure of progressive development of the law as well. They are designed to prevail among the parties to a treaty containing these articles, in the absence of applicable provisions of another treaty in force among the relevant system States. As article X provides, without prejudice to any obligation of system States to negotiate in good faith for the purpose of concluding one or more system agreements, the provisions of those articles do not affect treaties in force relating to a particular international watercourse system or elements of it.[813]

[813] See, in respect of the interplay of treaties and custom in the sphere of international watercourses, Baxter, "Treaties and custom", *Recueil des cours . . . 1970-I* (Sijthoff, Leyden, 1971), vol. 129, p. 25, and works there cited; Hayton, "The formation of the customary rules of international drainage basin law", *The Law of International Drainage Basins* (*op. cit.*), p. 834, and works there cited.

2. Need for codification of the topic

502. In the view of the Special Rapporteur, the need for codification of the topic is beyond dispute. The increasing intensity and complexity of use of international watercourses, and the dangers of abuse of international watercourses, require some development of elements of the topic which until this time have been imperfectly distilled from the considerable relevant State practice. It may indeed be fair to say that with respect to relatively few other subjects is co-operation and collaboration among the States concerned more imperative. As the late C. Eagleton, a leading student of the topic, said over 20 years ago:

> Each harnessing of a river alters its natural equilibrium and initiates a chain of important and interrelated repercussions. As a result, there exists, between the manifold uses to which a river may be put, a state of interdependence which demands unity of effort. The problem then is, simply, how may this unity be achieved. Now this obviously involves a different approach from that of two riparian States agreeding to a division of the benefits of an isolated segment of a river.
>
> Thus the task is of greater importance than a statement of principles of international law as evidenced by past practice. It is the recognition of, and regard for, the fundamental determination for peaceful co-development of a resource recognized to be as common in legal rights as it is in physics. Rivers simply do not pay homage to political boundaries. It is foolish to attempt to evoke laws that would have them do so.[814]

503. These sentiments have been equally reflected in studies prepared for the Asian-African Legal Consultative Committee at its twelfth session, in Colombo, in 1971, expressed for instance in these terms:

> In recent years, notably during the post-war period, it is being realized that a river system being a hydrologic unit, the entire drainage area of a river system ought to be considered as a single unit and that co-operative international river development would bring gain for all the co-operating parties. Even when the objectives of the riparian States are not alike, it is still possible that mutual accommodation can be a means of improving the economics of an international water resources undertaking, provided that the co-operation is sustained. A co-operative venture by all the riparian States can achieve more efficient use of a river than can an independently planned project.[815]

504. Similar convictions motivated the Institute of International Law at its Salzburg session in 1961, as reflected in the preamble to its resolution on "utilization of non-maritime international waters (except for navigation)":

> Considering that the economic importance of the use of waters is transformed by modern technology and that the application of modern technology to the waters of a hydrographic basin which includes the territory of several States affects in general all these States, and renders necessary its restatement in juridical terms,
>
> Considering that the maximum utilization of available natural resources is a matter of common interest,
>
> Considering that the obligation not to cause unlawful harm to others is one of the basic general principles governing neighbourly relations,
>
> Considering that this principle is also applicable to relations arising from different utilizations of waters,
>
> Considering that in the utilization of waters of interest to several States, each of them can obtain, by consultation, by plans established in common and by reciprocal concessions, the advantages of a more rational exploitation of a natural resource,
>
> Recognizes the existence in international law of the . . . rules, and formulates the . . . recommendations [set forth in the main body of the resolution].[816]

505. The impact of the "modern technology" referred to by the Institute of International Law in 1961 flourishes unabated. Its achievements in industry and agriculture complicate water management problems, yet it has advanced sharply the tools of investigation, monitoring and management.[817] The fragility of the biosphere has lately brought forward even more fundamental concerns; the central ecological role of water is forthrightly stated by one close student of the interrelationships:

> Water and environment, the two words cannot be dissociated. The integration of environmental aspects with water development and management is an absolute requirement. . . . In this sense, environment, which in itself could not be considered as a sector for management, is a dimension of water management.[818]

506. In response to calls from the United Nations Conference on the Human Environment, the United Nations "Habitat" Conference, the United Nations Water Conference and the United Nations Conference on Desertification, as well as the conclusions and recommendations of various other bodies, and its own resolution 34/191 of 18 December 1979, the General Assembly proclaimed the period 1981–1990 as the International Drinking Water Supply and Sanitation Decade.[819] This seemingly local matter of delivering the "liquid of life", and the handling of water-related wastes, has meaning for international watercourse systems. The supply of potable water is at issue; the

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[814] C. Eagleton, "The law and uses of international rivers", research project conducted under the auspices of the New York University School of Law, 30 June 1959, pp. 4–6 (mim.), reproduced in M. M. Whiteman, *Digest of International Law*, vol. 3 (Washington, D.C., U.S. Government Printing Office, 1964), pp. 874–875.

[815] Secretariat of the Asian African Legal Consultative Committee, *Brief of Documents on the Law of International Rivers* (New Delhi, 1971) vol. II, p. 429 (part II, chap. VI, "Rights of riparians regarding the uses of waters of international river basins"); see also J. V. Krutilla, *The Columbia River Treaty: the Economics of an International River Basin Development* (Baltimore, Md., Resources for the Future, 1967), pp. 3–4.

[816] *Annuaire de l'Institut de droit international, 1961*, vol. 49, Part Two, pp. 381–382. (Reproduced in *Yearbook . . . 1974*, vol. II (Part Two), p. 202, document A/5409, para. 1076). In the preamble to its "Athens resolution" of 1979, on "the pollution of rivers and lakes and international law", the Institute recalled its resolutions of 1911 and 1961, adopted at Madrid and Salzburg respectively, declared itself "conscious of the multiple potential uses of international rivers and lakes and of the common interest in a rational and equitable utilization of such resources through the achievement of a reasonable balance between the various interests", considered that "pollution spread by rivers and lakes to the territories of more than one State is assuming increasingly alarming and diversified proportions whilst protection and improvement of the environment are duties incumbent upon States", and recalled "the obligation to respect the sovereignty of every State over its territory, as a result of which each State has the obligation to avoid any use of its own territory that causes injury in the territory of another State" (*Annuaire de l'Institut de droit international, 1979*, vol. 58, Part Two, p. 197).

[817] See e.g., in exposition of one technique serving hydrology, earth sciences, remote sensing and engineering, *Satellite Hydrology*, M. Deutsch, D. Wiesnet and A. Rango, eds. (study prepared for the American Water Resources Association, 1980), with chapters on meteorology, snow and ice, surface water, soil moisture, water quality and environment, ground water, wetlands, coastal zones, hydrodata relay, and water use and management. See also, *inter alia*, International Association for Hydraulic Research, *Proceedings of the XIX Congress* (New Delhi, 1981); International Commission on Irrigation and Drainage, *Proceedings of the Third Afro-Asian Regional Conference* (New Delhi, 1980).

[818] D. Alhéritière, "Water and environment", *Water International*, vol. 5, Dec. 1980, p. 8.

[819] General Assembly resolution 35/18 of 10 November 1980.

resultant quality of the waters into which domestic wastes may be channelled is of concern to other States sharing international watercourse systems so burdened. Immense investment is required to meet the objectives of the Decade; both human and financial resources will be very great.[820]

507. In the light of such considerations, the formulation of widely accepted principles respecting international watercourses becomes ever more urgent. It would fundamentally facilitate active management of the resource, carried forward for joint benefit by system agreements:

> The essence of water management might be defined as an activity directed towards obtaining optimal co-ordination and harmonization of the natural complement of water resources with the needs of the society by means of planned scientific, technical, economic, administrative and legal measures. Accepting this definition, it appears to be obvious that the purpose of the development of international water management co-operative agreements is to establish advantageous international conditions for those activities as well as to provide for the benefits accruing from the international division of labour.
>
> The distinctive feature of water resources, unlike all other natural resources, highlights the importance of close co-operation between countries sharing the river basin concerned and of common efforts . . .[821]

3. Principles and rules reported and proposed

508. Thus far six articles have received provisional approval by the Commission and have been reported to the General Assembly (see para. 8 above). These treat of the scope of the articles (article 1), the definition of system State (article 2), system agreements (article 3), entitlement to participate in the negotiation and conclusion of system agreements (article 4), water as a shared natural resource (article 5), and the relationship between the articles and other treaties in force (article X).[822]

509. In his final report, the Special Rapporteur has submitted a number of proposed additional draft articles. These cover, in a first category, the concept of equitable participation (draft article 6), ascertainment of equitable use (draft article 7), responsibility for appreciable harm (draft article 8), information and data sharing (draft article 9), environmental protection and pollution (draft article 10), and prevention and control of water-related hazards (draft article 11).

510. A second group of articles follows, put forward in a still more tentative fashion. These are based upon less thorough studies and contain proposed draft articles on river regulation (draft article 12), hydraulic installations and water security (draft article 13), denial of inherent use preference (draft article 14), administrative arrangements (draft article 15), and avoidance and settlement of disputes (draft article 16).

511. The articles thus far proposed are interrelated, perhaps with a degree of overlapping in some instances. Some aspects of the topic are so closely related, if not in substance then by terminology, or by measures or activities of implementation, as to make difficult or impossible complete treatment without correspondence at their margins between certain provisions. This result is not viewed with concern. In practice, system States normally co-operate, if they co-operate at all, in a multifaceted manner to achieve a number of objectives. Measures of conservation, or of protection and control, are as likely to benefit from multiple arrangements as are uses of the international watercourse system. As system States strive to maximize benefits and minimize detriments from their shared water resources, uses and protection and control measures are in fact combined in various ways to form an integrated, managerial approach to the watercourse.

512. The Special Rapporteur remains persuaded that the concept provisionally defined and adopted by the Commission, that of the international watercourse system, is the preferable one. It has been shown to be a recognized concept employed in State practice and by specialists in and commentators upon the topic. The term "system" is believed preferable to, and is distinct from, the terms "basin" or "drainage basin", primarily in that its focus is on the waters and their uses and their interdependencies. "Basin" suggests, to some, the land area within the watershed as well as the waters, as if the physical basin—both land and water—might be governed by the rules of international water resources law. It is believed that the key element intended by the proponents of terms such as "hydrographic basin" is interdependent waters; however, the additional connotation of land area is avoided by the employment of the term "watercourse system". Indeed, "system" is capable of comprehending canals, groundwater and inter-basin connections without deformation of its plain meaning.[823] At the same time, the Commission's tentative definition of the international watercourse system limits its reach to the sphere of actual international impact; accordingly, for this reason as well, "international watercourse system" may not be equated with "drainage basin".

4. Aspects not reported on in this report or in preceding reports

513. The substantial total list of adopted or proposed draft articles leaves several questions not addressed, in addition to a range of possible articles on specific uses. These questions include the issue of the legality of diversion of water outside the international watercourse system, and the often intricate matter of cost sharing, for example for the production and processing of data or joint studies, the design, construction and operation of projects, the training of technical and managerial personnel, protection and control measures (structural and non-structural), etc.

514. Furthermore, the extremely important subjects of principles and rules governing development, use, protection and control of the waters of shared ground-

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[820] See M. Tikka, "Vesihuollon nykytila ja ongelmat eri maissa" (The present situation and problems of water supply and sanitation in different countries), *Vesitalous* (Helsinki), vol. 21, No. 4, 1980, p. 5; D. Peterson, "Water: a world problem", *War on Hunger* (Washington, D.C.), vol. 11, No. 7, 1977, p. 1.

[821] B. Csermák, "Goals and forms of co-operation between countries for the development of international river basins" (United Nations, *River Basin Development . . .*, vol. II, p. 28).

[822] In addition, an important tentative note of understanding was approved by the Commission concerning what was meant by the term "international watercourse system" (see *Yearbook . . . 1980*, vol. II (Part Two), p. 108, para. 90; see also para. 7 above).

[823] Care must be taken that translations of "system" into other languages retain the scientific meaning, and that terms meaning, for example, network (such as *red* in Spanish or *réseau* in French) not be accepted, in order to forestall undue narrowing of this concept.

water resources remains a substantial gap in the draft articles.[824]

515. In some international watercourse systems, a rule of equal access to information and to administrative and judicial process by nationals of co-system States—a matter of equal treatment—has already attained considerable importance. This aspect of the topic also has not been dealt with.

516. The Commission may wish to have the foregoing subjects and others explored. However, it is submitted that, with the articles thus far adopted or proposed in this report, most of the more basic and necessary draft principles and rules are before the Commission for reconsideration by a successor Special Rapporteur and consideration by the Commission.

5. Preservation of wild and scenic watercourses

517. An additional, unusual aspect, which has begun to achieve legal recognition, if in only a few countries to date, should be brought to the Commission's attention. This is the matter of preservation in their natural state of wild and scenic rivers. The desideratum is likely to gain broader recognition in the years ahead, in international as well as other watercourses. It involves the setting aside of a portion, or the entirety, of a stream, selected for its aesthetic beauty or its condition of being relatively unmodified by man: the native flora and fauna are typically abundant. Such free-running and unspoiled watercourses, so designated, will thus still be able to be experienced by future generations.

518. This kind of protection from overuse and abuse, and withdrawal from availability for development, is akin to the preservation of selected tracts and areas of land as national or international parks, where the wildlife and scenery are removed from the operation of ordinary legislation and are reserved, under special régimes, for controlled, limited use as preserves. While the creation and management of such parks is a widely accepted practice of States, the protective designation of a watercourse as a wild or scenic river is a relatively recent extension of the conservation movement. This is true even though a number of existing national and international parks contain portions of international watercourses that flow from, into or through them.

519. It may be hoped that more and more States will act upon their awareness of the progressive loss of these priceless and, once spoiled, irretrievable parts of their heritage. The Governments of many system States can be expected to designate some streams or extensive portions of such streams for preservation under special legal régimes. In some cases, system States may join forces to preserve an especially valuable portion of an international watercourse.

520. Not a few of the remaining unspoiled stretches of rivers are in fact segments of international watercourses.[825] The Commission's articles on the non-navigational uses of international watercourses could be cast in such a way as to contemplate this emerging practice and to comprehend such preservation régimes as an element of a State's equitable participation in the development, use, protection and control of international watercourse systems. The legislation of those States that have already taken up this policy of virtual non-use may merit study.[826] Legislation which provides for preservation of amenities more generally should also prove instructive.[827] Many countries may be prompted to move in this direction in order to conserve ancient monuments or artifacts, such as cave paintings, glyphs or dwellings, situated adjacent to the watercourse.

521. Preservation of wild and scenic watercourses is an element of environmental protection. "Unspoiled and unmarred rivers" have become

> as much an endangered species as [for example] the bald eagle, . . . whose existence depends on the health of the rivers along which it lives. Wild rivers are [moreover] outdoor laboratories where biologists can obtain important insights into the workings of nature by studying life cycles unchanged by man. They are also part of our . . . heritage—an untouched land that gives beauty and pleasure.[828]

522. Studies of hydrology, limnology and watershed management, among other water-related disciplines, also profit from the availability of relatively pristine "base points" of nature in action. These benefits are aside from the values intended to be served by the special legal régime imposed. But the hydropower potential of such streams, for example, or their capacity for timber floating, should remain untapped; any transport of silt unchecked; their flood stages unrestrained. The high long-range cultural or historical benefits derived from the isolation of some segments of an international watercourse from utilization projects and pro-

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[824] The ILA Committee on International Water Resources Law has a special Working Group on Underground Waters (Chairman/Rapporteur: R. D. Hayton), whose terms of reference and work programme are set out in ILA, *Report of the Fifty-third Conference* . . ., pp. 522 and 524–525. See also L. A. Teclaff and E. Teclaff, "Transboundary groundwater pollution: survey and trends in treaty law", *Natural Resources Journal*, vol. 19, 1979, p. 629; Caponera and Alhéritière, "Principles for international groundwater law", *ibid.*, vol. 18, 1978, p. 589; Hayton, "The law of international aquifers", *ibid.*, vol. 22, 1982, and "The groundwater legal regime as instrument of policy objectives and management requirements", (International Association for Water Law, *Annales Juris Aquarum—II*, vol. 1 (Caracas, 1976), p. 345); L.A. Teclaff and A. E. Utton, eds., *International Groundwater Law* (London, Oceana Publications, 1981).

[825] For example, the 92-mile-long Allagash River in the northern reaches of the State of Maine (United States), tributary of the St. John, which in one stretch contains the boundary between the United States (Maine) and Canada (Province of New Brunswick), was designated the Allagash Wilderness Waterway in 1970, saving the water route through the last great wilderness of the north-eastern United States.

[826] See e.g. the United States Wild and Scenic Rivers Act of 1968 *United States Code, 1970 Edition*, (Washington, D.C., 1971), vol. 4, title 16, chap. 28, sects. 1271–1287): "It is hereby declared to be the policy of the United States that certain selected rivers of the nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations" (sect. 1271). Under the Act, in addition to the Allagash, the middle fork of the Clearwater River, in Idaho, a major tributary of the Snake River, and thus within the international watercourse system of the Columbia River (Canada–United States) has similarly been designated; another tributary of the Snake River, the Salmon, also has its middle fork so designated. An upper segment of the Rio Grande (United States–Mexico) is likewise designated (sect. 1274). Others may be added.

[827] Since the park-like status for such streams is by design, and nature parks almost always include significant water resources, State practice in connection with international parks and other protected areas, such as wildfowl reservations and marshlands, should provide analogous guidance.

[828] *Rivers of North America* (Waukesha, Wis., Outdoor World, Wis., 1973), p. 197.

grammes naturally may have to be weighed, in appropriate cases, against the development goals of system States.

6. The question of particular uses

523. Should the articles advanced in this report, as revised and refined by a successor Special Rapporteur and the Commission, meet with substantial tentative acceptance, or should other articles of similar scope be adopted, the Commission would then, it is believed, be in a position to examine particular, non-navigational uses of international watercourse systems with a view to extracting use/specific principles and rules for codification and progressive development.

524. The Commission devised at an early stage of its work on the topic an outline of uses of non-maritime shared water resources for purposes of initial consideration.[829] The choice subsequently was made to pursue general principles and rules prior to taking up individual uses. Consequently little attention was devoted by the Special Rapporteur to the possible content of principles and rules governing the specific uses of international watercourse systems. No effort is made in this report to discuss any specific issues.

525. Prior work on the international law of particular uses is not extensive. Even the very few studies that have appeared do not pretend to many firm rules of law.[830] Conferences and studies on the technical aspects have been numerous. Development of minimal legal principles and rules, however, even by way of progressive development, may prove to be a major challenge. In the interim, a set of general articles, if approved, should serve, for States parties, to govern many of the system-State relationships associated with any particular use.

7. Final comments

526. In the preparation of his reports, every effort was made by the Special Rapporteur to base the conclusions reached and the draft articles proposed not simply on the compelling physical, chemical and biological realities affecting international watercourse systems, but upon the discernible practice of States. Thus the principles and rules put forward endeavour to make more definite and certain a number of widely accepted norms and, in an ancillary way, to regularize closely related procedural propositions in order to render the whole reasonable and workable. Most advantageously consulted were the solutions and standards of those Governments which had in fact found legal and institutional bases for dealing with the problems of international watercourses. The work of regional and universal intergovernmental conferences and agencies was helpful, as was the large contribution of several non-governmental professional organizations.

527. "The law of international rivers", as it has until recent years been called, has made a contribution to the evolution of customary international law. The necessity, over the centuries, for neighbouring States to negotiate their differences as "riparians" has enriched international law in a number of ways.

528. Consolidation, codification and progressive development of the law of the non-navigational uses of international watercourses is now overdue. The relations between system States the world over suffer from the lack of that clarified and sufficient product. This final report is submitted with a view to advancing the topic, however modestly, towards the Commission's goal of completion of its draft articles and commentary on a topic of quite special importance to international life and to the life of mankind.

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[829] That outline, submitted to the States as part of the Commission's questionnaire on the topic, is reproduced in *Yearbook . . . 1980*, vol. II (Part Two), p. 105, para. 69, question D.

[830] At the Second General Conference on Communications and Transit, held in Geneva in 1923, the Conference Committee on Electric Questions took as a basis for discussion a draft general agreement on hydropower prepared by a League of Nations Advisory and Technical Committee for Communications and Transit. The much modified result was the 1923 Convention relating to the development of hydraulic power affecting more than one State (League of Nations, *Treaty Series*, vol. XXXVI, p. 77). See also chap. 5, "Timber floating", of the Helsinki Rules (ILA, *Report of the Fifty-second Conference . . .*, pp. 511–516 (five articles with commentary). Legal aspects of navigation, here excluded, have, on the other hand, been subjected to intensive study by international jurists and in a number of intergovernmental meetings. The Declaration of Montevideo, 1933, of the Seventh International Conference of American States, identified itself as concerned with the "industrial and agricultural" use of international rivers, but was almost entirely given over to procedures for notification (with the necessary technical documentation), consultation and settlement of disputes of general application (for text, see *Yearbook . . . 1974*, vol. II (Part Two), p. 212, document A/5409, annex I, A).