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Treaty Practice Relating to Transboundary Flooding¹

ABSTRACT

Most agreements surveyed in this paper focus on maximum flood restraint by means of dams and other structures. As a rule, only floods having detrimental effects were perceived as the object of international regulation, and the idea of permitting some flooding for beneficial purposes, such as ecosystem preservation, does not appear in treaties until quite recently. Another non-structural approach to transboundary flooding, the preservation of watershed forests, has been equally neglected, but is making headway.

The paper concludes with the suggestion that applying principles of liability to transboundary flood damage caused by activities such as deforestation may be less effective than proper and timely measures of prevention upstream. In poor countries, such measures should be aided by the international regional and global communities.

INTRODUCTION

This is a companion paper, but with a broader geographical range, to Dr. Thayer Scudder's article on "The Need and Justification for Maintaining Transboundary Flood Regimes: The Africa Case." It will look briefly at legal attitudes toward transboundary floods in the past and then examine modern treaties in more detail to find out what sort of cooperation exists among states for flood protection on international rivers. The survey indicates that treaty practice emphasizes flood elimination by means of dams and dikes to the virtual exclusion of other aspects, such as beneficial releases of floodwaters and protection of watersheds and riverine habitat. It is argued that international flood control should rely more on preventive measures than on liability rules and reparation for damage done.

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1. This study draws selectively on the pioneering survey of treaties by F.J. Berber, Rapporteur to the International Law Association in 1972. See International Law Association, Report of the Fifty-Fifth Conference, New York, 1972, xiv, 22-106 (1974) [hereinafter ILA Flood Control Articles]. Professor Berber's survey was also selectively interpreted by the Special Rapporteur to the International Law Commission in the Fifth Report on the Law of the Non-Navigational Uses of International Watercourses, at 16, U.N. Doc. A/CN.4/421 (1989) [hereinafter Fifth Report].

Some of the oldest river regulation works in human history were for the purpose of flood protection and control. Indeed, flood protection measures extend back into prehistory, for the Babylonian epic of creation records that the legendary Marduk "laid reeds in the face of the waters" and piled up earthen banks sheltered by the reeds so as to master the Euphrates "flowing wide like a sea."² All the great river valleys of the fluvial civilizations of antiquity, in Mesopotamia, Egypt, and China, required flood protection measures.³ Their dependence on water control made these floodplain communities very susceptible to interference from without. Cooperation between them was often precarious and water control became a weapon in interstate struggles. When conflicts erupted, hydraulic works were liable to be destroyed.⁴ During China's feudal period, for example, states built more and more dikes and embankments to force excess water into neighboring territories, which were regarded merely as reservoirs for the surplus.⁵

This attitude toward floodwaters seems to have been characteristic of interstate relations throughout much of history. One of the very first documents on transboundary water resource management in Europe is an arbitral award of the Emperor Barbarossa in 1165 against the Count of Holland for constructing a dam which inundated the bishopric of Utrecht.⁶ When treaties affecting rivers appeared (from the 16th century onward), they mostly concerned navigation and boundary demarcation. Provisions bearing on floods begin to feature in boundary treaties from the 19th century and are restricted to frontier sections of rivers. They placed the parties under an obligation to maintain transboundary waters in a natural condition, and to prevent any alteration in the flow, bed or banks without the consent of the governments concerned.⁷ In a sense, these treaties may

2. Quoted in Willcocks, *River Regulation and Control in Antiquity*, H.R. Doc. No. 18, 63rd Cong. 2d Sess. 1 (1914).

3. See L. Teclaff, *The River Basin in History and Law* 16 (1967); K. Dalldorf, *Die Kunstliche Bewasserung Mesopotamiens* 28 (1953); O. Latimore, *Inner Asian Frontiers of China* 312 (2nd ed. 1951); M. Granet, *Chinese Civilization* 88-89 (1958).

4. J. Barton, *The Royal Inscriptions of Sumer and Akkad* 57-61 (1929).

5. Chi, Ch'ao-Ting, *Key Economic Areas in Chinese History as Revealed in the Development of Public Works for Water Control* 64 (1936).

6. Food and Agriculture Organization of the United Nations, *Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases by Basin* (Legislative Study No. 15, 1 (1978 [hereinafter *FAO Treaties*])).

7. Examples include the Treaty of Aachen, Oct. 7, 1816, Prussia-Netherlands, 3 Martens *Nouveau Recueil* 54 (text also in United Nations, *Legislative Texts and Treaty Provisions Concerning the Utilization of International Rivers for Other Purposes Than Navigation*, at 737, U.N. Doc. ST/LEG.SER.B/12 (1964) [hereinafter U.N. Legis. Ser.]); Belgium-Luxembourg Boundary Convention, Aug 7, 1843; 1 *Recueil des Traités* (Bel.) 339 (1850); Treaty for Regulating Abstraction of Water from the Meuse, May 12, 1863, Belgium-Netherlands, 1 Martens *Nouveau Recueil* (ser. 2) 117; Agreement Concerning Navigation of the Rhine, May 10, 1879, Switzerland-Baden, 13 *RD* 488; Additional Act to the Treaty of Bayonne, May 26, 1866, France-Spain, 56 *Brit. & For. State Papers* 226.

be regarded as helping to maintain ecosystems through an absolute minimum of flow regulation, but such was not their original intent, and they did little to foster cooperation between states on flood protection, beyond the requirement of mutual consent on activities affecting flow.

Modern Agreements on Flooding

The majority of agreements in the present century concerning inundation pertain to European rivers.⁸ The breakup of political units and the wholesale shifting of frontiers after both world wars entailed writing or rewriting a large number of boundary waters treaties. After World War II, some lowland rivers became new frontiers for hundreds of miles, for example, the Bug between the U.S.S.R. and Poland, and the Oder-Nysa between Poland and East Germany.⁹ In the mountain heartland of east-central Europe, many tributary streams feeding major international rivers such as the Danube changed hands. Quite often, the boundary-shifting meant that the flow regime of a river in one state depended on hydraulic works which were now in the territory of another state. This was recognized, for instance, in all three of the post-World War I peace treaties, Saint-Germain, Trianon, and Lausanne, which recommended that, in such situations, the states concerned should either draw up specific agreements to safeguard their interests or resort to arbitration.¹⁰

In the half-century or so of these European agreements, the chief concern of riparian states on rivers with densely populated and heavily industrialized floodplains was to secure from their neighbors adequate warning of threatened high waters and to invite cooperation on measures of protection and control. A typical example of flood warning occurs in the treaty between Austria and Liechtenstein of 1931, whereby the parties undertook to "direct their special attention to the organization and development of the service for reporting high waters."¹¹ The 1950 convention between the U.S.S.R. and Hungary records the parties' undertaking

8. See FAO Treaties, *supra* note 6, at 188-351 *passim*.

9. See, e.g., Atlas Historyczny Polski 54 (1973) showing the pre- and post-World War II frontiers of Poland. Some boundary waters of the pre-World War I period became frontiers again after World War II; for example, the Prut between Romania and the U.S.S.R.

10. Treaty of Saint-Germain-en-Laye, Sept. 10, 1919, art. 309, 11 Martens Nouveau Recueil (ser. 3) 691; Treaty of Trianon, June 4, 1920, art. 292, 12 Martens Nouveau Recueil (ser. 3) 423; Treaty of Lausanne, July 23, 1923, art. 109, 28 L.N.T.S. 12. In the 1920's, because of boundary changes, Germany alone concluded with its neighbors seven treaties containing flood provisions. See FAO Treaties, *supra* note 6, at 200, 223, 228, 231, 235-36. Similarly, after World War II, some 20 agreements relating to rivers of eastern Europe were concluded by the Soviet Union and its neighbors. See FAO Treaties, *supra* note 6, at 281-82, 285-86, 289-90, 293, 295-97, 302, 304, 307, 311, 314, 323, 330-31, 339.

11. Treaty Regarding the Regulation of the Rhine and Tributary Waters, June 23, 1931, Austria-Liechtenstein, art. 1.4, 134 Brit. & For. State Papers 581.

to develop existing installations and construct new ones to protect their territories against the notorious floods of the Tisza river basin.¹²

In many cases, however, the agreements drafted to take account of changed circumstances required not so much cooperation in undertaking new flood control works as a commitment to maintain the existing river regime and to refrain from taking unilaterally any measures liable to cause damage to the other party. This is especially true of agreements concerning long water frontiers. For instance, two Soviet treaties, one with Poland (1948) and one with Rumania (1949), proclaim in virtually identical wording that the natural flow of water in frontier watercourses and in adjacent areas inundated in time of flood may not be altered or obstructed to the detriment of the other party by the erection or reconstruction of installations in the water or on the banks.¹³

Generally, flood provisions have formed only part, sometimes a very minor part, of treaties on a wide variety of other subjects. In Europe, they are often restricted in scope to just the frontier portions of trans-boundary rivers.¹⁴ Other more recent instruments list flood protection, without specifying any action, as one of a number of water economy questions needing discussion between the parties and referral to a commission.¹⁵ Outside of Europe, flood provisions are frequently contained in treaties pertaining to the big multipurpose dams and projects developed, especially since World War II, for irrigation, water supply, and hydro-power.¹⁶ In these agreements, the flood articles mainly concern operation of the dams and the timing and amount of releases from storage, as outlined, for example, in Annex A of the Columbia treaty.¹⁷

Of the very few treaties devoted solely to flood protection and control, examples from Europe are the 1923 treaty between Germany and Poland

12. Convention Concerning Measures to Prevent Floods and to Regulate the Water Regime of the Frontier, June 9, 1950, U.S.S.R.-Hungary, art. 2, *translated text in U.N. Legis. Ser., supra* note 7, at 827-28.

13. Agreement Concerning the Frontier Regime, July 8, 1948, U.S.S.R.-Poland, art. 15.1, 37 U.N.T.S. 66; Treaty Concerning the Frontier Regime, Nov. 25, 1949, U.S.S.R.-Romania, art. 15.1, *translated text in U.N. Legis. Ser., supra* note 7, at 919.

14. As in most of the boundary treaties concluded after both world wars and noted *supra* note 10.

15. For example: Agreement Concerning Water Economy Questions, Dec. 5, 1956, Albania-Yugoslavia, art. I.2(i), *translated in U.N. Legis. Ser., supra* note 7, at 441; Agreement Concerning Water Economy Questions, Apr. 4, 1958, Bulgaria-Yugoslavia, art. I.2(h), 367 U.N.T.S. 104.

16. Typical of such agreements are the Rio Grande, Colorado and Tijuana Treaty of 1944, the Nile Waters Agreement of 1959, the Indus Waters Treaty of 1960, and the Columbia River Basin Treaty of 1961. Treaty Relating to the Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Feb. 3, 1944, United States-Mexico, 59 Stat. 1219, T.S. No. 994; Agreement for the Full Utilization of the Nile Waters, Nov. 8, 1959, United Arab Republic-Sudan, 15 Rev. Egyptienne de Droit International 321 (1959); Indus Waters Treaty, Sept. 19, 1960, 419 U.N.T.S. 126; Treaty Relating to the Columbia River Basin, Jan. 17, 1961, United States-Canada, T.I.A.S. No. 5638.

17. Columbia River Basin Treaty, *supra* note 16, Annex A, para. 5.

concerning the Vistula basin,¹⁸ the 1952 treaty between Rumania and the U.S.S.R. on the River Prut,¹⁹ and the 1955 agreement between Italy and Switzerland for regulation of the level of Lake Lugano.²⁰ In North America, the agreements between the United States and Canada concern the fluctuating levels of Lake of the Woods (1925), Lake Memphremagog (1935), and Rainy Lake (1938).²¹ In Asia, development credit agreements were drawn up in the 1960s for the Punjab Flood Protection Project and the Brahmaputra Flood Embankment Project,²² but these were simply for the building of works within the countries concerned and did not involve cooperation between states.

Administrative Arrangements

The administrative aspects of flood protection and control are quite varied in treaty practice. They range from a simple commitment by the contracting parties, operating individually with an absolute minimum of coordination, to elaborate mechanisms for supervision, execution of works, and even settlement of disputes, by a commission, either pre-existing or created especially for the purposes of the treaty. The simplest arrangements are to be found in boundary treaties limited to the maintenance of the *status quo* in flow regulation. A group of such agreements drawn up between the U.S.S.R. and its neighbors after World War II leaves it up to the contracting parties to designate their own "competent authorities" (which may even be local entities) to work out the details of frontier river regimes, including discharge of water and exchange of information.²³

Slightly more complex are the Prut and Tisza river agreements, which

18. Agreement Regarding a Common Dike Administration in the Marienwerder Plain, Jan. 27, 1923, Germany-Poland, 26 L.N.T.S. 461.

19. Convention Concerning Measures to Prevent Floods and to Regulate the Water Regime of the River Prut, Dec. 25, 1952, U.S.S.R.-Romania, *translated text in U.N. Legis. Ser., supra* note 7, at 923.

20. Convention Concerning the Regularization of Lake Lugano, Sept. 17, 1955, Italy-Switzerland, 291 U.N.T.S. 219.

21. Agreement to Regulate the Level of Lake of the Woods, Feb. 24, 1925, United States-Canada, 44 Stat. 2108, T.S. No. 720; Exchange of Notes Regarding the Level of Lake Memphremagog, Sept. 20 and Nov. 6, 1935, United States-Canada, T.S. No. 548 (1935); Convention Providing for Emergency Regulation of the Level of Rainy Lake, Sept. 15, 1938, United States-Canada, 54 Stat. 1800, T.S. No. 961.

22. Development Credit Agreement, Punjab Flood Protection Project, Nov. 22, 1961, I.D.A.-India, 427 U.N.T.S. 3; Development Credit Agreement, Brahmaputra Flood Embankment Project, June 26, 1963, I.D.A.-Pakistan (Bangladesh), 492 U.N.T.S. 115.

23. Agreement Concerning the Frontier Regime, Dec. 29, 1949, Norway-U.S.S.R., art. 15, 83 U.N.T.S. 342; Agreement Concerning the Frontier Regime, July 8, 1948, Poland-U.S.S.R., art. 15, 37 U.N.T.S. 66; Treaty Concerning the Frontier Regime, Feb. 24, 1950, Hungary-U.S.S.R., art. 15, *translated in U.N. Legis. Ser. supra* note 7, at 823; Treaty Concerning the Frontier Regime, Nov. 25, 1949, Romania-U.S.S.R., art. 15, *translated in U.N. Legis. Ser. supra* note 7, at 919.

concern only flood protection.²⁴ They call for each party to appoint a commissioner and two deputy commissioners, whose task is to coordinate river regulation work and inspect dikes and other installations.²⁵ In the Lake Lugano treaty of 1955 between Italy and Switzerland, also primarily for flood protection, the Commission has somewhat broader powers for overseeing the construction and subsequent operation of lake-level regulation works.²⁶ These commissions are essentially technical bodies. So are the ones designated as such in the Kunene River Agreement of 1926 (Joint Technical Commission),²⁷ the Nile Waters Agreement of 1959 (Permanent Joint Technical Committee),²⁸ and the Columbia River Basin Treaty of 1961 (Permanent Engineering Board).²⁹ They are responsible for carrying out surveys and research, keeping flow records, making inspections, reconciling technical and operational differences, and recommending courses of action.³⁰

Their responsibilities are not confined to transboundary flooding, however, and neither are the duties of the more broadly conceived water resources commissions, such as the Yugoslav-Rumanian Water Control Commission, the International Boundary and Water Commission, United States-Mexico, and the International Joint Commission, United States-Canada.³¹ These latter entities are concerned, of course, with technical matters, but their terms of reference extend to the entire regime of waters and water uses within the frontier zone, which covers an immense distance in the case of the North American bodies. Flood protection, therefore, may be dealt with by special arrangement, but under the aegis of a pre-existing administration. For example, the 1925 agreement to regulate the Lake of the Woods³² was the outcome of prolonged study and recom-

24. River Prut Convention, *supra* note 19; Convention Concerning Measures to Prevent Floods and to Regulate the Water Regime in the Area of the Frontier River Tisza, June 9, 1950, Hungary-U.S.S.R., translated in U.N. Legis. Ser., *supra* note 7, at 827.

25. River Prut Convention, *supra* note 19, arts. 10 & 11; River Tisza Convention, *supra* note 24, arts. 10 & 11.

26. Lake Lugano Convention, *supra* note 20, art. VI.

27. Agreement Regulating the Use of the Waters of the Kunene River, July 1, 1926, Portugal-South Africa, art. 9, 70 L.N.T.S. 315.

28. Nile Waters Agreement, *supra* note 16, art. IV.

29. Columbia River Basin Treaty, *supra* note 16, art. XV.

30. See Kunene River Agreement, *supra* note 27, arts. 8(a) & 9; Nile Waters Agreement, *supra* note 16, arts. IV.1 & V; Columbia River Basin Treaty, *supra* note 16, art. XV.

31. See Agreement Concerning Questions of Water Control with the Statute of the Yugoslav-Rumanian Water Control Commission, Apr. 7, 1955, Yugoslavia-Romania, art. 1 and statute, translated in U.N. Legis. Ser., *supra* note 7, at 928; Rio Grande, Colorado and Tijuana Treaty, *supra* note 16, art. 2 (outlining the functions of the previously established International Boundary and Water Commission); and Boundary Waters Treaty, Jan. 11, 1909, United Kingdom (Canada)-United States, arts. VII-XII (establishing the International Joint Commission and detailing its functions), 36-Stat. 2448, T.S. No. 548.

32. Lake of the Woods Agreement, *supra* note 21. Art. 3 of this agreement established an International Lake of the Woods Control Board specifically to approve changes in the discharge of lake water, but the overall authority rested with the International Joint Commission.

mendations by the International Joint Commission (IJC), which was established more than a decade earlier.³³ Under the IJC's direction, the lake levels have been successfully managed to satisfy a variety of interests, from fishing to navigation, power, and irrigation.³⁴

All these numerous treaties indicate that states do cooperate extensively in flood protection and control, but they also show, as pointed out in the International Law Association's black-letter articles on flood control,³⁵ that lack of uniformity in state practice concerning transboundary floods may have prevented the emergence of any customary rules other than the general duty to cooperate.³⁶

Recognizing the Benefits of Floods

It may be noted that the International Law Association (ILA) used the expression flood *control*, which it defined as "the taking of all appropriate steps to protect land areas from floods or to minimize damage therefrom."³⁷ Only floods having detrimental effects were perceived as the object of international regulation.³⁸ The idea of permitting floodwaters to pass downstream wholly or partially unobstructed for *beneficial* purposes, such as basin irrigation, or the preservation of wetlands and estuarine ecosystems, does not seem to have been considered by the ILA in the context of treaty making.

The duty to let normal or recurring floodwaters pass, however, exists in the riparian rights doctrine of municipal law.³⁹ A maxim of immemorial custom, *aqua currit et debet currere ut currere solebat*,⁴⁰ for centuries minimized interference with surface flow and operated to preserve riverine ecosystems. In the 19th century, it was embodied in the natural flow version of the riparian rights doctrine, which spread from Europe to the United States, Latin America, Africa, and parts of Asia.⁴¹ In the present century, riparianism in municipal law has given way to permit systems of water resources disposition almost everywhere, but the essence of that doctrine—linking water use and land ownership firmly together within

33. See *supra* note 31. The problem of maintaining the Lake of the Woods at a stated level was one of the first references made (in 1912) to the Commission by the governments of the United States and Canada. 3 Whiteman, *Digest of International Law* 827-28 (1964).

34. J. Carroll, *Environmental Diplomacy* 310 (1983).

35. See ILA Flood Control Articles, *supra* note 1.

36. However, the Special Rapporteur to the International Law Association, in his draft Article 22 (Water-related hazards, harmful conditions and other adverse effects), included in this duty to cooperate the regular and timely exchange of data and information. Fifth Report, *supra* note 1, Addendum at 33, U.N. Doc. A/CN.4/421/Add.1 (1989). He believed such exchange to have become part of the corpus of general international law. *Id.* at 12.

37. ILA Flood Control Articles, *supra* note 1, at 47.

38. *Id.* at 46-47 and comment at 47.

39. See W. Hutchins, II *Water Rights Laws in the Nineteen Western States* 68 (1974).

40. "Water runs, and ought to run, as it used to." *Quoted in Shury v. Piggot*, 81 Eng. Rep. 280, 281 (K.B. 1625).

41. See L. Teclaff, *Water Law in Historical Perspective* 36-43 (1985).

the bounds of a natural unit and the reciprocal obligations of a community of users—became enshrined in international water law in the river basin concept and its inherent duty of states to cooperate.⁴²

An outstanding example of beneficial use of floodwaters for irrigation is the history of the Nile Valley.⁴³ For millenia the free flow of the River Nile was not impeded and its silt-laden floods constantly renewed the fertility of Egyptian soil. However, when Egypt's upstream neighbor, the Sudan, began to develop its cotton cultivation early in this century, a long bickering over rights to Nile water followed,⁴⁴ which culminated in the building of the Aswan High Dam and the Nile Waters Agreement of 1959 apportioning the waters of the river between the two countries.⁴⁵ The treaty ended the dispute between Egypt and the Sudan, but it did not safeguard the ecology of the Nile delta and adjacent coastal waters of the Mediterranean sea.⁴⁶

Wetlands furnish another instance when the unimpeded passage of floodwaters can be beneficial. In addition to being a valuable resource, wetlands also provide a non-structural means (that is, needing no levees or other hydraulic works) of protecting floodplains.⁴⁷ They mitigate the force of rampaging waters and siphon off the excess flow into innumerable minor channels, providing fish and wildlife habitat, as well as the basis for many human uses of a semi-aquatic environment.⁴⁸ Nevertheless, attitudes toward wetlands preservation have generally been negative in international river law. A typical example occurs in the report of the Joint Argentine-Paraguayan Frontier Commission (1944), stating that if the course of the Pilcomayo River were not stabilized, part of the territory of one of the bordering countries might be left covered with "useless"

42. *Id.* at 424-25.

43. See Hamdan, *Evolution of Irrigation Agriculture in Egypt*, A History of Land Use in Arid Regions 119 (L. Stamp ed. 1961).

44. See Garretson, *The Nile Basin*, The Law of International Drainage Basins 256, 261-62 (A. Garretson, R. Hayton & C. Olmstead, eds. 1967); Exchange of Notes in Regard to the Use of the Waters of the River Nile for Irrigation Purposes, 1929, United Kingdom-Egypt, 93 L.N.T.S. 44.

45. Nile Waters Agreement, *supra* note 16.

46. While there are conflicting assessments of the impact of the Aswan High Dam, it definitely seems to have had adverse effects downstream on water quality and fisheries and to have accelerated coastal erosion in the delta. See White, *The Environmental Effects of the High Dam at Aswan*, 30 *Env't* 4 (Sept. 1988), and sources cited therein.

47. See United States, Standards for Evaluating Projects Affecting Wetlands, issued by the Secretary of the Treasury on Aug. 29, 1988, Treasury Dep't news release, Sept. 6, 1988, reprinted in 18 *Env'tl. Pol'y & L.* 191 (1988) [hereinafter Treasury Standards].

48. That wetlands have a positive role in flood protection is well illustrated by what happens when they are drained. The East Anglia (England) fen drainage provides a particularly instructive example, because the adverse effects have been recorded over a long period of time. Disastrous floods followed within two decades of the project's inception in the 17th century, and have recurred many times since. As the land dried out, it subsided to a level below that of the rivers, so that successive floods caused ever-greater damage. See Teclaff and Teclaff, *A History of Water Development and Environmental Quality*, in *Environmental Quality and Water Development* 26, at 36-37 (C. Goldman, ed. 1973); H. Darby, *The Draining of the Fens, A.D. 1600-1800* (1936).

marshes.⁴⁹ However, a few treaties might be considered as protecting floodplain wetlands. One is the boundary treaty of 1928 between Austria and Czechoslovakia.⁵⁰ It prescribes that, when regulating a frontier waterway, care is to be taken to avoid excessive draining of land on either side of the river.⁵¹

A more interesting document, because it recognizes the role of natural overflow in the economies of indigenous peoples, is the Portugal-South Africa Agreement of 1926 concerning the Kunene River and its floodplain in what was then the Mandated Territory of South-West Africa.⁵² The preamble of the treaty refers to the fact that from time immemorial portions of the territory had been periodically inundated by flood waters of the Kunene; that by silting up of some of the natural channels of those waters the volume of the overflow had greatly decreased; and that it was vital to the health and comfort, if not to the very existence, of the native tribes that the natural overflow channels remain open.⁵³ Hence, the treaty provided that no hydraulic work be done in boundary waters without the consent of the other party.⁵⁴ Moreover, the joint technical commission to be set up was specifically and uniquely charged with devising a means of supplying water for the purpose of *inundation*.⁵⁵

Within the past two decades the question of natural inundation vis-a-vis flood control became a thorny U.S.-Canadian problem in the Lake Champlain-Richelieu River basin between the upstream riparians, the states of Vermont and New York, and the downstream riparian, the Province of Quebec.⁵⁶ The upstream riparians, especially Vermont, have a large stake in Lake Champlain and wished to maintain its natural levels, so as to preserve a wetland habitat and ecosystem which would be damaged by structural controls lower down on the river.⁵⁷ Quebec wanted regulation of the lake levels so as to protect growing settlements in the floodplain of the Richelieu River, which flows northward out of the lake entirely within Canadian territory.⁵⁸ Since the matter fell within the purview of the Boundary Waters Treaty of 1909,⁵⁹ it was referred in 1973 to the International Joint Commission.⁶⁰ The difficulty of resolving dis-

49. Final Report of the Joint Argentine-Paraguayan Frontier Commission, Aug. 16, 1944, *translated in U.N. Legis. Ser., supra* note 7, at 154.

50. Treaty Regarding the Settlement of Legal Questions Connected with the Frontier, Dec. 12, 1928, Austria-Czechoslovakia, 108 L.N.T.S. 56.

51. *Id.* art. 29.2(b).

52. Kunene River Agreement, *supra* note 27.

53. *Id.* Preamble, paras. 5, 6 & 7.

54. *Id.* § 18.

55. *Id.* § 9.

56. For a detailed account of this dispute, see J. Carroll, *supra* note 34, at 104-13.

57. *Id.* at 108-10.

58. *Id.* at 105 and 110.

59. Boundary Waters Treaty, *supra* note 31.

60. J. Carroll, *supra* note 34, at 106.

putes over an environmental issue such as this is illustrated by the fact that, after long study culminating in proposals for a scheme of flow regulation designed both to preserve the ecosystem of the lake and provide downstream flood protection, the IJC refused to make a final determination and turned the matter back to the two governments for diplomatic negotiation.⁶¹

Despite the pressure for maximum flood restraint, the concept of wetlands preservation is making headway. For example, inadequate protection of wetlands is one of the main problems identified in the Zambezi Action Plan (ZACPLAN) for the multistate Zambezi River system.⁶² The beneficial role of wetlands is recognized and made an integral part of water resources development policy in standards issued in 1988 by the U.S. Treasury Department for evaluating multilateral development bank loans to developing countries.⁶³ According to these guidelines, loans should not be given for projects that adversely affect wetlands; to the contrary, the projects should preserve the hydrological regime of the ecosystems.⁶⁴ Whether governments can be persuaded to undo or modify existing structures so as to permit beneficial flooding is another matter, but encouragement may come from an unusual quarter. Reportedly, the U.S. Army Corps of Engineers, that bastion of structural solutions to water resource problems, is studying the feasibility of removing flood-control levees and returning the lower Mississippi River to a free-flowing waterway.⁶⁵

Deforestation Rarely Recognized in Flood Treaties

Another non-structural approach to transboundary flooding, the preservation and restoration of watershed forests, is equally neglected in treaty practice. Yet, it is well known that deforestation in the Himalayan mountains contributes heavily to the disastrous floods in Bangladesh, that bare and eroded watersheds in Ethiopia mean surging waters when the Blue Nile reaches Khartoum in the Sudan, and that such events are a source of rising tension and international conflict.⁶⁶ Cause and effect are hundreds

61. *Id.* at 106-07, 111-12.

62. Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System, 1987, Annex I, para. 14, 27 I.L.M. 1109, at 1118 (1988) [hereinafter ZACPLAN].

63. See Treasury Standards, *supra* note 47.

64. *Id.*

65. 5 *U.S. Water News* 5 (Feb. 1989).

66. According to Mostapha Tolba, former Executive Director of the United Nations Environment Programme, the Nile is so severely affected by deforestation, other environmental damage, and poor water management that major international conflicts may develop over its resources. 12 *Int'l Envtl. Rep. (BNA)*, *Curr. Rep.* 12-13 (1989). Conversely, political tensions cause environmental harm, as when India severed Nepal's trade links to the sea in the spring of 1989, forcing the Nepalese to strip their already devastated forests for fuelwood. This can only result in more damaging floods, for India as well as for Bangladesh. See B. Crossette, *Nepal's Economy is Gasping . . .*, *New York Times*, Apr. 11, 1989, at A12, col. 1.

of miles apart, however, and the causative factor is not a use or abuse of the shared *water* resource, which forms the basis of most international river treaties. Rather, it is the failure to prevent the destructive impact of a land use wholly within national boundaries.

Nevertheless, some treaties and guidelines do take account of the relationship between vegetation cover and flood protection. For example, the European Water Charter of 1967 proclaims as a principle that the maintenance of an adequate vegetation cover, preferably forest land, is imperative for the conservation of water resources and is a factor of major importance for the stabilization of drainage basins and their water regime.⁶⁷ Forest protection and water resources are linked together in treaties between Guatemala and its neighbors, El Salvador and Honduras,⁶⁸ and protection against soil erosion features in the water economy treaties entered into between Yugoslavia and its neighbors, Albania, Bulgaria, and Hungary.⁶⁹ Municipal law provides an example from the United States in the Susquehanna River Basin Compact, stating that the comprehensive basin-wide planning, which is the objective of the Compact, will provide flood damage reduction and forest land management, soil conservation, and watershed projects.⁷⁰

Recently, five countries of the Zambezi River basin agreed upon ZACPLAN to implement environmentally sound water resources management in the whole river system.⁷¹ This is expected to include: coordination of existing international efforts concerning problems of land-use practices in relation to flood and drought control;⁷² improvement in the enforcement of national laws and regulations relating to the river basin with respect, *inter alia*, to deforestation;⁷³ and adoption of a regional convention, with protocols, for the protection, management and development of river basin resources.⁷⁴ Among the projects for implementation is the adoption of

67. Council of Europe, European Water Charter, Strasbourg, 1967, para. VI, *text in* Supplementary Report by the Secretary-General, Legal Problems Relating to the Non-navigational Uses of International Watercourses, 2 Y.B. Int'l L. Comm'n 342-43, U.N. Doc. A/CN.4/274 (1974).

68. Treaty of Free Trade and Economic Integration, Dec. 14, 1951, Guatemala-El Salvador, art. 19, 131 U.N.T.S. 132; and Treaty of Free Trade and Economic Integration, Aug. 22, 1956, Guatemala-Honduras, art. 19, 263 U.N.T.S. 66.

69. Agreement Concerning Water Economy Questions, Dec. 5, 1956, Albania-Yugoslavia, art. 1.2(i), *translated in* U.N. Legis. Ser., *supra* note 7, at 441; Agreement Concerning Water Economy Questions, Apr. 4, 1958, Bulgaria-Yugoslavia, art. 1.2(h), 367 U.N.T.S. 104; Agreement and statute of the Yugoslav-Hungarian Water Economy Commission, 1955, Hungary-Yugoslavia, art. 1(i), *translated in* U.N. Legis. Ser., *supra* note 7, at 928.

70. Susquehanna River Basin Compact, P.L. 91-575, 84 Stat. 1509, Preamble, para. 2 (1967).

71. ZACPLAN, *supra* note 62. For a brief survey of the development and compass of the ZACPLAN, see R. Hayton, *Developments in Co-Operative Action Concerning Shared Water Resources*, at 5-9, U.N. Doc. ECA/NRD/IMRLBD/3 (1988) (paper prepared for the Interregional Meeting on River and Lake Basin Development with Emphasis on the Africa Region, held at Addis Ababa, Ethiopia, Oct. 10-16, 1988).

72. ZACPLAN, *supra* note 62, para. 29(g) at 1123.

73. *Id.* para. 30 at 1124.

74. *Id.* para. 33 at 1124.

watershed management guidelines based on an assessment of the effects of modification on the relationships between forest cover, water, and land utilization.⁷⁵ ZACPLAN offers a framework for coordinated water and land use management which could have far-reaching implications for a more ecosystem-sensitive pattern of resource use. Whether it will engender a convention and protocols defining a positive liability on the part of basin states for failure to prevent activities indirectly causing environmental damage elsewhere in the basin remains to be seen.

Liability for Flood Damage

How far may a state be liable for deforestation that causes transboundary flooding? States are undoubtedly responsible and liable for acts that transgress norms of international law imputable to them.⁷⁶ But the kind of deforestation carried out on mountain slopes in many parts of the Third World results mainly from the activities of countless small farmers and villagers. These activities are not in themselves illegal. Immediately and individually they may not do any transboundary harm, but en masse and over time they can bring disaster. The principle of strict liability for any activities that cause substantial damage across frontiers would encompass such deforestation.

Principle 21 of the Stockholm Declaration of 1972 seems to be all-encompassing.⁷⁷ It asserts that:

States have, in accordance with the Charter of the United Nations and the principle 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 limit of national jurisdiction.⁷⁸

Liability enunciated by the *Trail Smelter* Tribunal is also couched in all-embracing terms:

The Tribunal, therefore, finds that the above decisions, taken as a whole, constitute an adequate basis for its conclusions, namely, that

75. *Id.* at appendix I, ZACPRO 13.

76. In the *Chorzow Factory (indemnity)* case, the International Court of Justice stated: "It is a principle of International Law, and even a general conception of law, that any breach of an engagement involves an obligation to make reparation." Concerning the *Factory at Chorzow (Germany v. Poland)*, 1928 P.C.I.J. (Ser. A) No. 17, at 29 (Sept. 13). See also Article 1 of the International Law Commission's Draft Articles on State Responsibility, which states: "Every internationally wrongful act of a state entails international responsibility of that state." Report of the International Law Commission on the Work of its Twenty-Fifth Session, 7 May—13 July 1973, 28 U.N. GAOR Supp. (No. 10) at 11, U.N. Doc. A/9010/Rev. 1 (1973). See also Commentary to Article 1, *supra* at 11-15.

77. U.N. General Assembly, *Report of the United Nations Conference on the Human Environment*, held at Stockholm, at 5, U.N. Doc. A/Conf. 48/14 (1972) (reprinted in 11 I.L.M. 1416) [hereinafter *Stockholm Report*].

78. *Id.*

under the principles of international law, as well as of the law of the United States, 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 or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.⁷⁹

But the claim that state liability pertains to everything that happens on, and causes damage beyond, a state's territory is weakened in Principle 21 by the phrase which affirms the sovereign right of states to exploit their own resources pursuant to their own environmental policies in accordance with the Charter of the United Nations and principles of international law.⁸⁰ Thus, as long as activities on their own territories are not wrongful under international law, there may be no liability. By this interpretation, Principle 21 does not establish strict liability for transboundary environmental harm.⁸¹ Neither does *Trail Smelter*, since it pertained to air pollution and the scope of liability may be limited to that medium.⁸²

If strict liability cannot be established as a rule of general international law whenever there is transboundary environmental harm,⁸³ then states would be strictly liable only when they accepted strict liability for particular types of activities.⁸⁴ The oft-quoted pronouncement of the International Court of Justice in the *Corfu Channel* case:⁸⁵

79. 3 U.N. R.I.A.A. 1938, 1965-66 (1941).

80. Stockholm Report, *supra* note 77, Principle 21.

81. On Stockholm Principle 21, *see de Arechaga, International Law in the Past Third of a Century*, 1 Recueil des Cours 127 (Hague Academy 1978). He says:

It is true that the wide terms of paragraph 21 of the Stockholm Declaration, which refers to the responsibility of the State to ensure that no damage is caused, lend some apparent support to this thesis. However, that Declaration must be interpreted and applied within the framework of the general principles and rules of customary international law which govern State responsibility, as it is emphasized for instance in Article 236 of the ICNT of the Law of the Sea Conference. According to the customary rules a State's international responsibility for transfrontier pollution cannot be brought into play unless the State itself has caused the damage or, if it has been caused by private operators, the State can be shown to have fallen short of the diligent behaviour which other States are entitled to expect of it.

See also Sohn, *The Stockholm Declaration on the Human Environment*, 14 Harv. Int'l L.J. 423, 492-93 (1973); Handl, *Balancing of Interests and International Liability for the Pollution of International Watercourses: Customary Principles of Law Revisited*, 13 Canadian Y.B. Int'l L. 156, 158-62 (1975).

82. On *Trail Smelter*, *see* Handl, *supra* note 81, at 167-68; Weiss, *Who Pays for Weather Modification Damage?*, 4 Env'tl. Pol'y & L. 22, 23 (1978); Kiss, *Problemes Juridiques de la Pollution de l'Air*, in Hague Academy of International Law, Colloquium 1973: The Protection of the Environment and International Law 145, at 172 (C. Kiss ed. 1975).

83. *See supra* notes 81 and 82.

84. For example, art. II of the Convention on International Liability for Damage Caused by Space Objects, March 29, 1971, 24 U.S.T. 2389, T.I.A.S. No. 7762, which says: "A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight."

As far as objective (strict) liability for ultra-hazardous activities in general international law is concerned, *see* P.-M. Dupuy, *La Responsabilite Internationale des Etats Pour les Dommages d'Origine Technologique et Industrielle* 209 (1977), which maintains that experience from domestic law shows that the establishment of strict liability is difficult in the absence of *lex specialis* (specific law).

85. *Corfu Channel* (U.K. v. Albania), 1949 I.C.J. Acts & Docs. 4.

Such obligations are based . . . on certain general and well-recognized principles, namely . . . every state's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other states. . . .⁸⁶

seems to support the more restrictive view of state liability for transboundary harm.⁸⁷

In the case of deforestation of mountain slopes, states may be not only unaware of potential transboundary harm, but unable to prevent it. Thus, even if it were universally agreed that Principle 21 of the Stockholm Declaration articulates a rule of international customary law and states were to accept liability for all activities within their jurisdiction causing substantial environmental damage in the territories of other states, that would not necessarily solve the problem. Liability may imply, but does not assure, prevention of damage. In a situation like that of Nepal and Bangladesh, or Ethiopia and the Sudan, any attempt on the part of the injured state to have these activities stopped might cause economic hardship in the originating state which neither of them could redress.⁸⁸ Would either Bangladesh or Nepal be able to provide an alternative source of energy to replace fuelwood culled from the denuded Himalayan mountainsides?

In such a case, it is meaningless to assign individual responsibility, and for what? The responsibility and liability should shift to the larger community, regional or global, which is better equipped to avert or mitigate natural disasters. The interdependence of natural resources may eventually bring about (indeed, is already bringing about in concern over the ozone layer and the greenhouse effect) an awareness of the interdependence of responsibility for preventing their misuse. And, indeed, the International Law Commission, in its study of liability for injurious consequences arising out of acts not prohibited by international law, shows a growing understanding of the role of prevention and allocation of risk and costs of transboundary environmental harm.⁸⁹

86. *Id.* at 22.

87. See de Arechaga, *International Responsibility*, in *Manual of Public International Law* 531, 537 (Sorensen ed. 1968); Handl, *State Liability for Accidental Transnational Environmental Damage by Private Persons*, 74 *Am. J. Int'l L.* 525, 537-38 (1980).

88. This problem was evidently foreseen at the Stockholm Conference in a statement qualifying Principle 21 of the Declaration:

Without prejudice to such criteria as may be agreed upon by the international community, or to standards which will have to be determined nationally, it will be essential in all cases to consider the systems of values prevailing in each country and the extent of the applicability of standards which are valid for the most advanced countries but which may be inappropriate and of unwarranted social cost for the developing countries.

Stockholm Report, *supra* note 77, Principle 23.

89. See Fourth Report of the Special Rapporteur, *International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, 2 *Y.B. Int'l L. Comm'n*, at 224, sec. 5, U.N. Doc. A/CN.4/373 (1983).