

University of Colorado Law School

Colorado Law Scholarly Commons

The Law of International Watercourses: The United Nations International Law Commission's Draft Rules on the Non-Navigational Uses of International Watercourses (October 18)

1991

10-18-1991

The Law of the Non-Navigational Uses of International Watercourses: Draft Articles on Protection and Preservation; Harmful Conditions and Emergency Situations; and Protection of Water Installations

Ved P. Nanda

Follow this and additional works at: <https://scholar.law.colorado.edu/law-of-international-watercourses-united-nations-international-law-commission>



Part of the [Courts Commons](#), [Environmental Law Commons](#), [Environmental Policy Commons](#), [International Law Commons](#), [Natural Resources and Conservation Commons](#), [Natural Resources Law Commons](#), [Natural Resources Management and Policy Commons](#), [Public Policy Commons](#), [Water Law Commons](#), and the [Water Resource Management Commons](#)

Citation Information

Nanda, Ved P., "The Law of the Non-Navigational Uses of International Watercourses: Draft Articles on Protection and Preservation; Harmful Conditions and Emergency Situations; and Protection of Water Installations" (1991). *The Law of International Watercourses: The United Nations International Law Commission's Draft Rules on the Non-Navigational Uses of International Watercourses (October 18)*. <https://scholar.law.colorado.edu/law-of-international-watercourses-united-nations-international-law-commission/7>

Reproduced with permission of the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment (formerly the Natural Resources Law Center) at the University of Colorado Law School.



Ved P. Nanda, *The Law of the Non-Navigational Uses of International Watercourses: Draft Articles on Protection and Preservation; Harmful Conditions and Emergency Situations; and Protection of Water Installations*, in *THE LAW OF INTERNATIONAL WATERCOURSES: THE UNITED NATIONS INTERNATIONAL LAW COMMISSION'S DRAFT RULES ON THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES* (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 1991).

Reproduced with permission of the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment (formerly the Natural Resources Law Center) at the University of Colorado Law School.

THE LAW OF THE NON-NAVIGATIONAL USES
OF INTERNATIONAL WATERCOURSES

DRAFT ARTICLES ON PROTECTION AND PRESERVATION;
HARMFUL CONDITIONS AND EMERGENCY SITUATIONS;
AND PROTECTION OF WATER INSTALLATIONS

Ved P. Nanda
Thompson G. Marsh Professor of Law
and Director
International Studies Program
University of Denver College of Law

THE LAW OF INTERNATIONAL WATERCOURSES:
The United Nations International Law
Commission's Draft Rules on the Non-Navigational
Uses of International Watercourses

Second Nicholas R. Doman
Colloquium on International Law

University of Colorado
School of Law
Boulder, Colorado

October 18, 1991

C

C

C

DRAFT

**THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL USES OF
INTERNATIONAL WATERCOURSES -- DRAFT ARTICLES ON PROTECTION AND
PRESERVATION; HARMFUL CONDITIONS AND EMERGENCY SITUATIONS;
AND PROTECTION OF WATER INSTALLATIONS**

Ved P. Nanda*

I. INTRODUCTION

[A brief two-page introductory statement outlining the gravity of the situation and the need to include articles on the protection and preservation of the ecosystems of international watercourses will precede the following discussion.]

The Commission's task is "the promotion of the progressive development of international law and its codification."¹ The task of this paper is to comment on the draft articles included as Parts IV and V and an article included among miscellaneous provisions. Part IV is entitled "Protection and Preservation." It prescribes the obligations of watercourse states concerning "protection and preservation" of the ecosystems of international watercourses (article 20); prevention, reduction and control of pollution (article 21); introduction of alien or new species (article 22); and protection and preservation of the marine environment (article 23). Part V, entitled, "Harmful Conditions and Emergency Situations," includes international watercourse states' obligations to prevent or mitigate harmful conditions (article 24); and obligations concerning notification and cooperation in emergency situations (article 25). Among miscellaneous provisions, article 29 addresses questions concerning the protection and use of international watercourses and installations in time of armed conflict. The discussion

II. COMMENTS ON THE DRAFT ARTICLES

A. ARTICLE 20

Article 20 lays down a general obligation for watercourse states "to protect and preserve the ecosystems of international watercourses." In doing so, this draft article exemplifies the generally progressive, and welcome, nature of the overall efforts embodied in these articles. In particular, this article can be seen as part of the effort to codify a more 'holistic' approach to the law of the non-navigational uses of international watercourses.²

1. The Concept of "Ecosystem"

Article 20 obligates watercourse states to consider their non-navigational uses of international watercourses in terms of the effect upon the "ecosystem" of the international watercourse. The article itself does not define the term "ecosystem," nor is it defined in article 2, where the terms "international watercourse," "watercourse" and "watercourse state" are clarified. The International Law Commission (ILC) provides a definition of an ecosystem in the commentary on article 20, stating that the term "refers to an ecological unit consisting of living and non-living components that are interdependent and function as a community."³

The use of the term "ecosystem" reflects relatively recent changes in the draft articles by the ILC. The Special Rapporteur's fourth report in 1988, which included the initial draft language for this article, did not contain the term "ecosystem".⁴ The

language suggested by the Special Rapporteur spoke in terms of protecting "the environment of an international watercourse [system], including the ecology of the watercourse and of surrounding areas."⁵

During discussions of the draft article by the ILC in 1988, the suggestion was made that the ILC consider including "a definition of the expression 'environment of an international watercourse' in a future introductory article so as to make it clear that the ecology or ecosystems of international watercourses were also covered."⁶ Other comments underscored the desire of ILC members to bring "greater clarity" to the object of the article, "the environment of an international watercourse."⁷

In response to these comments, the Special Rapporteur noted that the article, as drafted, intended to show that "ecology" was included within the broader concept "environment." However, the article was not intended to cover the entire environment beyond that of international watercourses.⁸

If we look back at the history of the concept "ecosystem," we would probably agree that, with one exception, the definition provided in the commentary on article 20 is clear and reflects the holistic sense of the term as it is generally used. The concept of "ecosystem" first appeared in the U.S. scientific literature in the mid-1930s. In his 1935 article, Professor Tansley suggested that an ecosystem was "the whole system (in the sense of physics), including not only the organism-complex, but also the whole complex of physical factors forming what we call the environment of the biome -- the habitat factors in the widest sense."⁹

A more formal definition proposed in 1942 by Raymond Lindeman suggested that

an ecosystem should be considered as: "the system composed of physical-chemical-biological processes active within a space-time unit of any magnitude, i.e., the biotic community plus its abiotic community."¹⁰ More recent scientific writing on ecosystems mirrors this latter definition. For example, the Ehrlichs state that "an ecosystem is the functional unit that includes both biotic (living) and abiotic (nonliving) elements."¹¹ The emphasis on systems is notable in all of these definitions.

The one significant difference between this latter definition and the definition provided by the ILC is the reference in the commentary's definition to an ecosystem as an ecological unit which is interdependent and functions "as a community."¹² At least in biological terms, the use of this phrase adds nothing that is not already present in the concept of an ecosystem. In ecological terms, a "community" is a subset of the ecosystem in which the community is situated.¹³ The two represent different levels of biological analysis.¹⁴ Therefore, it would be helpful if the commentary were modified to clarify this unnecessary source of confusion.

The concept of ecosystem has seen slow and uneven progress in the level of its acceptance into the arena of environmental law. For example, there has been a gap between the acceptance of the concept in the scientific community and the domestic acceptance of the term into U.S. environmental law. The use of the concept in U.S. public land policy was suggested as early as 1970 by Lynton Caldwell.¹⁵ Yet, twenty years later, commentators would be lamenting that U.S. federal land managers still had no "legal obligation . . . to protect shared ecosystem resources."¹⁶

In the context of international agreements, although there have been an increasing

number of calls for ecosystem management of international watercourses,¹⁷ it is only in the last decade that the concept has begun to appear in the language of international documents and resolutions. The United Nations Environment Program in its ten year review recognized this need, noting that the period from 1972-1982 had seen "increasing recognition of the need for better management of water resources by treating river basins as unitary systems."¹⁸

However, the concept was slow to be incorporated into actual international agreements. As noted by the ILC,¹⁹ the term "eco-system" was used in the 1978 Agreement between Canada and the United States on Great Lakes Water Quality, where reference is made to "the Great Lakes Basin Ecosystem."²⁰ Explicit use of the term "ecosystem" appears also in a few documents such as the Convention on the Conservation of Antarctic Marine Living Resources,²¹ the World Charter for Nature,²² and a few regional agreements.²³

As can be seen from these examples, the use of the term "ecosystem" has generally been limited to those agreements which addressed wildlife resources and biodiversity issues, not the use of international watercourses specifically.²⁴

The increasing usage of the ecosystem concept, as evidenced by these international agreements, as well as the draft articles themselves, is indicative of the trend towards more regional-based management efforts.²⁵ Article 20 is fully consistent with this trend. The ILC recognizes this broadening of focus, noting that the emphasis on protection and preservation of ecosystems intended by this article is part of a larger recognition by states of the necessity to protect ecological processes rather than just

individual species or discrete attributes of the environment.²⁶ As noted by Professor Odum, "the concept of the ecosystem is and should be a broad one, its main function in ecological thought being to emphasize obligatory relationships, interdependence and causal relationships."²⁷ Under such a broad definition, the emphasis on flood control, apportionment, or hydropower generation which has dominated previous international agreements concerning international watercourses would no longer be the only concerns of such agreements.²⁸ This increased breadth encompassed by the ecosystem concept means both increased applicability and increased complexity in that application.

2. Some Implications of the Ecosystem Concept

a. Defining the Limits.

The ILC notes that it "preferred to utilize the term 'ecosystem' [rather than the term "environment", which was originally suggested, because it] believed [the term] to have a more precise scientific and legal meaning."²⁹ The ILC felt that the term "environment" "could be interpreted quite broadly, to apply to areas 'surrounding' the watercourses that have minimal bearing on the protection and preservation of the watercourse itself."³⁰ While the commentary rightly suggests that the term "ecosystem" is subject to more "precise" scientific definition than "environment," it is not as clear to this observer that the use of the term "ecosystem" will, in fact, lead to more legal precision.

For example, the question of defining the boundaries of the ecosystem of an international watercourse will still require the exercise of considerable discretion on the part of those grappling with the reality of inadequate data or conflicting interpretations

of data. Article 2(b) of these draft articles defines the term "watercourse" as "a system of surface and underground waters constituting by virtue of their physical relationship a unitary whole and flowing to a common terminus." In the commentary on this language, ILC makes clear that groundwater, so long as it is interrelated with surface waters, forms part of the watercourse.³¹

Yet, the determinations whether (a) a proposed action will appreciably affect the groundwater at issue, or (b) the groundwater actually is physically connected with the surface water, may involve questions of significant practical uncertainty. For example, the recent United Nations study on groundwater in Eastern and Northern Europe is replete with statements indicating the need for additional information concerning groundwater resources in those countries.³²

Similarly, it is not difficult to imagine the discussion that might arise concerning whether a particular species of waterfowl that migrates through a country, spending only a short while on the watercourse is, in fact, part of the watercourse ecosystem.³³

Perhaps the response in such cases is that this question of the boundary of an ecosystem must be viewed in light of the extent to which there may be appreciable harm, under article 7 of the draft articles. As noted by the ILC, the appreciable harm standard inquiry "embodies a factual standard [with the] harm [] capable of being established by objective evidence."³⁴ To the extent that the location of the ecosystem boundary is not determinable, the likelihood that the harm will be appreciable is also likely to be correspondingly diminished. Nevertheless, caution seems in order with regard to the hope that increased precision in defining the limits of the area to be considered will

result from the use of the concept "ecosystem."

This discussion contains strains of that which attended the debate over whether to use the phrase "drainage basin," "watercourse system," or just "watercourse."³⁵ Some states objected to the use of the "drainage basin" concept because they viewed it as applying to land areas as well.

The use of the "ecosystem" concept would appear responsive to those concerns, in that ecosystems are defined in terms of (usually observable) interrelationships and not directly on the basis of geography. Again, as expressed by Professor Odum, it is the presence of major components that "operate together to achieve some sort of functional stability" that is the key to defining the concept of ecosystem, and not geographic factors.³⁶ Therefore, article 20 rightly places the focus on systems or relationships, rather than geography, thereby ameliorating fears that unrelated lands will be subject to the application of the article.³⁷

b. Breadth of Application

The breadth of the application of the concept of "ecosystem" intended by the ILC is illustrated in the commentary on article 20. The ILC notes that "an external impact affecting one component of an ecosystem causes reactions among other components and may disturb the equilibrium of the entire ecosystem."³⁸ The ILC goes on to recognize that such an impact "may impair or destroy the ability of an ecosystem to function as a life-support system."³⁹

Two comments are in order here. First, the concept of an "ecosystem" does not distinguish between the human species and other species, whether plant or animal. Again,

as stated by Professor Odum, "[p]opulations of men [sic], like other populations, are a part of larger units, i.e., biotic communities and ecosystems."⁴⁰ Assuming that both humans and non-human species actually live in or use the international watercourse under consideration, then all should be considered part of the ecosystem. The language used by the ILC -- that impacts on one component cause reactions among other components -- is entirely consistent with this view.

Therefore, the use of the ecosystem concept in article 20 continues the trend noted earlier to focus more broadly on larger ecological units, such as habitats or drainage units, and less on specific components of those habitats or units. In so doing, the article represents a rebalancing of the role of humans relative to the rest of the biosphere, with other species and elements of the biosphere being afforded increased importance. Such a rebalancing parallels changes and discussions in the U.S. environmental law area⁴¹ and should be viewed as a positive step forward in the effort to treat causes rather than symptoms of environmental degradation.

Second, the focus in article 20 on ecological processes draws attention to the dynamic and changing nature of interactions between human communities and the other elements of the ecosystems of which they are a part. These interactions are not static; they change through time as human populations change in size, if for no other reason.⁴² This has both positive and negative aspects.

The article 20 obligation is phrased in terms of protecting and preserving the ecosystems of international watercourses. The ILC states that the verb "protect" "requires that watercourse states shield the ecosystems of international watercourses from

harm or damage."⁴³ The verb "protect" implies that the current condition of an ecosystem is considered desirable to maintain. Therefore, it is prospective in application, unlike article 21, for example, which explicitly addresses situations where states have an obligation to clean up current degradation resulting from pollution.⁴⁴

Likewise, the verb "preserve" implies protection of the current condition, whatever that may be, although the ILC notes that it intended the obligation to preserve to apply "in particular to freshwater ecosystems that are in pristine or unspoiled condition."⁴⁵

However, many international watercourse ecosystems are currently in degraded states from the standpoint of soil erosion resulting from deforestation, decreases in biological diversity, and the like.⁴⁶ It is not clear that article 21 would apply to situations involving the rectification of current ecosystem degradation, where that degradation does not fall within customary definitions of pollution. This represents a potential problem with the article as it is currently drafted and could perhaps be clarified in the commentary.

As to the article's positive potential, to 'protect' and 'preserve' the ecosystem of an international watercourse implies a breadth of consideration that will prospectively direct the attention of watercourse states to the broader causes of ecosystem degradation, poverty and increased population being two of the most significant. As noted by the ILC, "[t]he obligation to protect and preserve the ecosystems of international watercourses addresses this problem [of unsustainable development], which is already acute in some parts of the world."⁴⁷ In that sense, this article contains a very positive potential for engaging the attention of watercourse states with regard to these issues.

c. Fluctuations in Quantity

Given the very thorough discussion in the commentary on the draft articles of their meaning and intent, as a whole, it is somewhat puzzling that the word "quantity" is not mentioned in the commentary on article 20.⁴⁸ Yet fluctuations or changes in the quantity of water in a watercourse often have significant consequences for a watercourse's ecosystem. The building of a dam can often be the single most significant negative impact on the ecosystem of an international watercourse.⁴⁹ In this context, the recommendation made by the OECD that "[t]he quantitative relationship between water quality and quantity must be thoroughly evaluated prior to a management decision"⁵⁰ bears listening to.

It is not clear from the commentary why this concept is omitted. However, if one takes the language of article 20 seriously, then the expected physical consequences of a project, such as a dam, or any significant diversion of water from an international watercourse, would need to be looked at very carefully in terms of the mandate to protect and preserve the ecosystem of international watercourses provided in article 20.

B. ARTICLE 21

The commentary to article 21 claims that the article finds a broad support in state practice, as evidenced in treaties, decisions of international tribunals, and the work of international organizations. Scholarly organizations, especially the International Law Association and the Institute of International Law have made enormous contributions to the subject in their ongoing studies. Recently, the Experts Groups on Environmental Law of the World Commission on Environment and Development (WCED) drafted legal

principles for environmental protection and sustainable development. The growing worldwide concern with environmental degradation and pollution is reflected in the urgency with which states are willing to address the issue. The upcoming 1992 UN Conference on Environment and Development evidences this concern.

1. Definition of Pollution

Article 21, paragraph 1, defines "pollution" of an international watercourse to mean "any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct."

a. General

In general, the term "pollution" has lacked a precise definition under international law.⁵¹ It is only in a specific and yet contextual setting in which the term is to be applied, for example, pollution of water, air, watercourse, et cetera, so that its meaning can be discerned, and then only by reference to "scientific standards and criteria by which it could be precisely determined in what sense a specific environment can be regarded as impaired and at what point the impairment should be regarded as intolerable."⁵² The definition assumes significance for the determination of the rights and obligations of states which derive from the permissibility or impermissibility of certain acts or omissions causing "pollution."

The starting point in defining water pollution is the 1966 Report of the International Law Association's (ILA's) Committee on the Uses of the Waters of International Rivers, which was adopted by the ILA at its Helsinki Conference in 1966.⁵³ Widely known as the Helsinki Rules, Rules IX-XI address the topic of

pollution.⁵⁴ "Water pollution" in the Helsinki Rules "refers to any detrimental change resulting from human conduct in the natural composition, content, or quality of the waters of an international drainage basin."⁵⁵

The definition was limited to description, as it specifically referred to "the physical alteration in the natural quality or content of the water."⁵⁶ Deliberately excluded were the legal incidents of such alterations.

Although the Report considered it "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,"⁵⁷ in the next article it linked the impermissible legal threshold of pollution to the principle of "equitable utilization."⁵⁸ It explained:

The concept of equitable utilization of the waters of an international drainage basin has the purpose of promoting . . . an accommodation [of the multiple and diverse uses of the co-basin States]. Thus, uses of the waters by a basin State that causes pollution resulting in injury in a co-basin State must be considered from the overall perspective of what constitutes an equitable utilization.⁵⁹

The threshold adopted was that of substantial injury or damage.⁶⁰ Injury or damage to the environment independent of its effects on subsequent users was disregarded.

Six years later, at the New York meeting in 1972, the Committee presented draft articles on "Marine Pollution of Continental Origin," which enunciated a state's obligation to prevent any existing sea-water 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."⁶¹ In the commentary, the Report noted increasing support for the protection of maritime waters "and the flora and fauna living [there] in the interest of all."⁶² However, in its 1982 report which elaborated the Helsinki Rules the Committee stuck to its earlier position that impermissible water pollution is to be determined by the measure of its causing "substantial injury in the territory of another state."⁶³

b. Harm to the Environment of the Watercourse States

By the mid-1970s, several conventions used an expanded definition of "pollution" to include "harm to marine life" and "reduction of amenities," as in the Convention on the Protection of the Marine Environment of the Baltic Sea Area⁶⁴ and the Convention for the Protection of the Mediterranean Sea Against Pollution,⁶⁵ and "harm to marine eco-systems," as in the Convention for the Prevention of Marine Pollution from Land-Based Sources.⁶⁶ Finally, the definition of "pollution of the marine environment" in the 1982 U.N. Convention on the Law of the Sea includes "harm to . . . marine life," and "reduction of amenities."⁶⁷

During the last two decades, there has been an enhanced appreciation for the environment, especially so since the 1972 Stockholm Conference on the Human Environment which declared in Principle 21 states' obligations "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."⁶⁸ The concern derives from our greater awareness and understanding of the interrelatedness between human beings and the environment. In specifically including harm to the environment of watercourse

states as impermissible pollution,⁶⁹ the ILC Draft appropriately reflects and acknowledges these developments.

c. Change in the Quantity of Water

The definition of "pollution" in article 21 again fails to refer to a change in the quantity of water as constituting pollution. One could perhaps read into the "quality" component of the definition an implicit reference to the quantity, for a change in the volume, velocity or turbulence of the water might involve water pollution.⁷⁰ The commentary, however, provides little help on the issue: while suggesting that it is difficult and perhaps even undesirable to define "quality" with precision,⁷¹ the only specific reference under quality is to "the essential nature and degree of purity of water."⁷² The commentary is otherwise thorough in defining and explaining what is included or excluded from a particular term and why. Therefore, the conclusion seems inescapable that while the quantity of water could certainly be considered as an integral component of the Draft's "equitable utilization" concept,⁷³ it is excluded from the determination of "water pollution" under the Draft.

Whatever considerations might have prompted this exclusion, changes in the quantity of water in a watercourse adversely affect the natural assimilation process. As Professor Davis explains:

Diversion of water for irrigation, manufacturing, and public water supply can reduce the flow available to an amount less than the minimum required for natural waste assimilative processes. Unless the volume and concentration of treated and untreated waste discharges can be reduced or

the streamflow increased, the wastes will overwhelm the assimilative processes of the stream. That process will result in insufficient or zero oxygen levels in the water, fish kills and odors. An appropriate balance between streamflow and waste discharges is essential to a healthy stream.⁷⁴

d. Detrimental Alteration

The final comment on the definition of pollution relates to the reference in article 21 to "any detrimental alteration." Unlike some other definitions such as the one used in the 1982 U.N. Convention on the Law of the Sea, which include a risk of such alteration by adding the "likely to result in . . . harm" language,⁷⁵ article 21 seemingly rejects that risk-based approach.

Granted, the second paragraph of article 21 specifically obligates watercourse states to "prevent, reduce and control pollution of an international watercourse that may cause appreciable harm to other watercourse States or to their environment," and the commentary explains that the duty to prevent harm includes the duty to prevent the threat of such harm.⁷⁶ Here, the commentary refers back to the watercourse states' obligation to protect ecosystems under article 20, explaining that "the principle of precautionary action is applicable, especially in respect of dangerous substances such as those that are toxic, persistent or bioaccumulative."⁷⁷ This approach, however, reflects a half-hearted acceptance of the risk factor, without acknowledging that the risk, or perhaps "significant risk," of detrimental alteration constitutes pollution.

There is certainly precedent for such rejection of a risk-based approach in the

ILA's 1982 Draft Articles intended to elaborate the Helsinki Rules. There, the ILA Committee on International Water Resources Law rejected the suggestion to include conduct that "is likely to result in" harm.⁷⁸ In its comment, the Committee said: "The view that Article IX of the Helsinki Rules should be widened to conform with these definitions [which include the "likely to result in" harm language] was rejected by the Committee on the ground that pollution is a fact and not an apprehended state of affairs."⁷⁹

The argument is not persuasive. As the WCED Experts Group on Environmental Law explicitly stated in their proposed article 10, states are obligated to "prevent or abate any transboundary environmental interference or a significant risk thereof which causes substantial harm,"⁸⁰ and in article 11 on liability for transboundary interference resulting from lawful activities,⁸¹ and as the 1982 U.N. Convention on the Law of the Sea explicitly states,⁸² it seems desirable for the ILC to have included the risk of harm in the definition of pollution.

In paragraphs 2 and 3, the ILC Draft builds on the pertinent existing conventions and state practice. Paragraph 2 prescribes the threshold for impermissible pollution. As noted above,⁸³ it includes a watercourse state's obligation to prevent, reduce and control pollution which causes harm to the environment, among other harms. The commentary explains that the reference to the environment encompasses, in particular, matters such as the living resources of the international watercourse, flora and fauna dependent on it, and the amenities connected with it, such as recreation and tourism.⁸⁴ A footnote adds that appreciable pollution harm to a watercourse state's environment could also

encompass harm to human health.⁸⁵ Thus the term "environment" is appropriately viewed by the ILC to be broader than the "ecosystem" concept used earlier in article 20.⁸⁶ This treatment of the environmental harm is in conformity with other such recent formulations.⁸⁷

2. The Concept of Appreciable Harm

Article 2(2) imposes an affirmative obligation on states. What is prohibited under the article is harm. However, not all harm is proscribed; the standard used is that of "appreciable harm." The modifier "appreciable" is introduced earlier under draft article 3, and the standard of appreciable harm is spelled out under draft article 7 which obligates watercourse states to "utilize an international watercourse in such a way as not to cause appreciable harm to other watercourse States."

Article 3, which applies to watercourse agreements, states that such an agreement, which it also defines, "does not adversely affect, to an appreciable extent, the use by one or more other watercourse States of the waters of the international watercourse."⁸⁸ The commentary explains that by "appreciable" adverse effects is meant "a real impairment of use," that is, capable of being established by objective evidence.⁸⁹ It distinguishes the term "appreciable" from "substantial," stating that to be termed "appreciable," the adverse effect "need not rise to the level of being substantial."⁹⁰

The commentary refers to the Lake Lanoux case (between Spain and France, in which Spain challenged the French plan of diversion of water from Lake Lanoux, claiming such diversion to be a violation of prior treaty arrangements),⁹¹ in which the arbitral tribunal held that, in the absence of any assertion that Spanish interests were

affected in a tangible way, Spain could not require maintenance of the natural flow of the waters. The tribunal said:

[T]hanks to the restitution effected by the devices described above, none of the guaranteed users will suffer in his enjoyment of the waters . . . ; at the lowest water level, the volume of the surplus waters of the Carol, at the boundary, will at no time suffer a diminution;⁹²

The commentary to draft article 7 explains that the governing rule of that article, mandating that the utilization of an international watercourse by a watercourse state must not cause "appreciable harm" to other watercourse states, is an application of the maxim sic utere tuo ut alienum non laedas (use your own property so as not to injure the property of others), which itself reflects the sovereign equality of states.⁹³ The obligation, which extends as well to the conduct of private entities operating in a state,⁹⁴ is to prohibit not all harm, but "appreciable" harm, a term bearing the same meaning as in draft articles 3 and 4.

The commentary adds:

The harm must be capable of being established by objective evidence.

There must be a real impairment of use, i.e. a detrimental impact of some consequence upon, for example, public health, industry, property, agriculture or the environment in the affected State. "Appreciable" harm is therefore that which is not insignificant or barely detectable, but is not necessarily "serious." The passages from the arbitral award in the Lake Lanoux case discussed in the commentary to article 3 are also pertinent

here.⁹⁵

Two comments are in order: one concerns the choice of "harm" over "injury," and the other concerns the choice of the adjective "appreciable." In the view of this commentator, both choices are commendable.

a. Harm vs. Injury

The Helsinki Rules prescribe the standard of "substantial injury" for the determination of the proscribed state conduct concerning water pollution in an international drainage basin.⁹⁶ The Restatement (Third) of Foreign Relations Law of the United States (Restatement) also uses the term "injury" to signify prohibited state conduct.⁹⁷ However, the Special Rapporteur proposed, and the Commission accepted, his preference for the factual standard of harm because of its clarity, instead of the legal concept of injury.⁹⁸

b. "Appreciable" vs. "Substantial" or "Significant"

The ILC selected "appreciable" among the many qualifying terms frequently used to modify "harm", such as substantial, significant, sensible (in French and Spanish), and appreciable, because it concluded that among these terms, "appreciable provides the most objective and factual standard."⁹⁹ In the commentary, for illustrative purposes, the Commission enumerates several international instruments which employ the expression "appreciable harm," or its functional equivalent in French and Spanish, which is "sensible."¹⁰⁰

The ILC choice of "appreciable" is noteworthy, especially in light of the use of the term "substantial" both by ILA and the WCED's Experts Group on Environmental Law.

To illustrate, the 1966 Helsinki Rules employ the modifier "substantial"¹⁰¹ and the ILA followed the same nomenclature in its 1982 Rules, revising the Helsinki Rules,¹⁰² "taking into account developments in theory and practice since 1966."¹⁰³ The suggested rule drafted by the WCED's Experts Group would obligate states to "prevent or abate any transboundary environmental interference or a significant risk thereof which causes substantial harm -- i.e., harm which is not minor or insignificant."¹⁰⁴

As to what constitutes "appreciable" harm, the ILC explained that it is "that which is not insignificant or barely detectable, but is not necessarily 'serious.'"¹⁰⁵ As already noted, the WCED's Experts Group on Environmental Law also explained that "substantial" harm is "harm which is not minor or insignificant."¹⁰⁶ Is the difference between these terms then simply a matter of semantics? Perhaps so, but the ILC's intent is clear when it states in the commentary that for the adverse effect to be appreciable, it "need not rise to the level of being substantial."¹⁰⁷ Thus, measured in terms of the degree of harm, the lower threshold standard of impermissible pollution prescribed under the ILC Draft is a positive step forward.

3. Prevention, Reduction and Control of Pollution

The affirmative obligation of watercourse states to "prevent, reduce and control" such impermissible pollution is elaborated in the commentary to article 21(2). The 1982 U.N. Convention on the Law of the Sea uses the same formula in relation to marine pollution.¹⁰⁸ As the commentary explains, prevention relates to new pollution "from existing or planned activities, such as factories, sewage disposal systems, or irrigation projects, to the extent that such pollution 'may cause appreciable harm to other

watercourse States or to their environment."¹⁰⁹ The obligation extends "to prevent the threat of such harm,"¹¹⁰ for the obligation is to prevent pollution which "may cause" appreciable harm. By referring to article 20, the commentary adds that "the principle of precautionary action is applicable, especially in respect of dangerous substances such as those that are toxic, persistent or bioaccumulative."¹¹¹

The commentary states that the obligation to "reduce and control" pollution relates to existing pollution, an obligation reflecting state practice. It explains:

This practice indicates a general willingness to tolerate even appreciable pollution harm, provided - and this is an important proviso - that the watercourse State of origin is making its best efforts to reduce the pollution to a mutually acceptable level. A requirement that existing pollution causing such harm be abated immediately could, in some cases, result in undue hardship, especially where the detriment to the watercourse State of origin was grossly disproportionate to the benefit that would accrue to the watercourse State experiencing the harm. On the other hand, failure of the watercourse State of origin to exercise due diligence in reducing the pollution to acceptable levels would entitle the affected State to claim that the State of origin had breached its obligation to do so.¹¹²

In 1988, Special Rapporteur Professor Stephen McCaffrey had, in his fourth report,¹¹³ canvassed the pertinent state practice, the work of the Institute of International Law, and the publicists' writings in support of the proposition stated here that if the watercourse state of origin is making "its best efforts to reduce the pollution to

a mutually acceptable level," state practice shows "a general willingness to tolerate even appreciable pollution harm."

The "due diligence" standard to prohibit pollution generated lively discussion at the Commission's fortieth session in 1988 when the members debated the earlier version of the draft articles on pollution and on states' obligation concerning impermissible pollution.¹¹⁴ Some members criticized the concept on the ground that it was imprecise, "too weak and too subjective,"¹¹⁵ because it placed a heavy burden on the victim's state to prove that the state of origin had not exercised due diligence.¹¹⁶ Views were also expressed supporting the strict liability standard as well.¹¹⁷

The Special Rapporteur, however, convinced the members that "due diligence" was the proper standard because it was flexible and it had considerable support in state practice. In his words, under the standard,

a watercourse State would be internationally responsible for appreciable pollution harm to another watercourse State only if it had failed to exercise due diligence to prevent harm. In other words, the harm must be the result of a failure to fulfil the obligation of prevention. Mere failure to exercise due diligence, without appreciable harm to another watercourse State, would not entail responsibility, because what was involved in such a case was an obligation of result, not of conduct.¹¹⁸

On the question of responsibility, he convinced the members that "it touched on the topics of State responsibility and liability for acts not prohibited by international law,"¹¹⁹ two topics also under discussion at the International Law Commission. He said

that "there was little, if any, evidence of State practice that recognized strict liability for pollution damage that was non-accidental or did not result from a dangerous activity -- which matters properly fell within the scope of [ILC's discussions on those other topics]."¹²⁰

In the same vein, article 1(c) of ILC's 1982 Rules on Water Pollution in an International Drainage Basin obligates states to "attempt to further reduce any [existing] water pollution to the lowest level that is practicable and reasonable under the circumstances."¹²¹ The commentary to that article states:

By paragraph (c) of this new Article 1, legal pressure is put on states to do more than meet the bare minimum level of pollution required by the "substantial injury" standard. The paragraph imposes the obligation on states to attempt to reduce water pollution below that level to the extent that is practicable and reasonable under the circumstances to do so. This is a weak obligation, but it is not without value. By providing some leverage against states, it will promote the ultimate aim of eliminating pollution that is harmful to health or property or that disturbs the ecological balance or adversely affects the environment.¹²²

The ILC commentary to article 21 appropriately adds that pollution below the threshold prescribed in article 21(2) for state obligation to prevent it, *i.e.*, pollution which "may cause appreciable harm to other watercourse States or their environment," may still be covered either by the article 20 obligation to protect and preserve the ecosystem of international watercourses, or by the article 23 obligation to protect and preserve the

marine environment, including estuaries.¹²³

4. Obligation to Act "Individually or Jointly"

As to the states' obligation to act "individually or jointly" and to take measures to "harmonize their policies" so as to prevent, reduce and control water pollution, the commentary refers to the general obligations contained in draft article 5 (on equitable and reasonable utilization and participation) and draft article 8 (on cooperation). Thus, "[j]oint and cooperative action is to be taken where appropriate, and such action is to be taken on an equitable basis."¹²⁴

The obligation pertaining to the harmonization of the relevant policies and standards of watercourse states is supported by state practice. The commentary refers to several international agreements embodying this obligation, irrespective of the parties' varied concerns concerning certain specific subjects, such as the protection of fisheries, the prevention of adverse effects upon certain uses, or the setting of water quality standards and objectives.¹²⁵ The 1982 UN Convention on the Law of the Sea also prescribes a similar obligation.¹²⁶

If watercourse states adopt varied policies or standards regarding the pollution of international watercourses which diverge -- some being less stringent than others -- they are likely to result in conflicts between and among watercourse states. As the commentary explains, the conflicts may arise in the case of contiguous watercourses, lakes or aquifers straddling boundaries, and among upstream and downstream states as well. Harmonization of the watercourse states' policies and standards concerning water pollution "will help to mitigate or avoid these problems."¹²⁷ Thus, the duty to

harmonize the policies of watercourse States means that they "are to work together in good faith to achieve and maintain" such harmonization. The duty is not to formulate and apply identical policies, but to avoid or remove their conflicts.¹²⁸ Since these draft articles are aimed at encouraging cooperative action to combat watercourse pollution, this obligation is an essential one appropriately included here.

5. The Duty to Consult

The duty to consult is contained in paragraph 3 of article 21. It obligates watercourse states to consult "at the request of any of them, . . . with a view to establishing lists of substances, the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored." There is a long-established state practice of establishing lists of such substances which are "toxic, persistent or bioaccumulative," and are especially dangerous and of long-lasting nature.¹²⁹

There was considerable discussion on this subject at the fortieth session of the Commission in 1988.¹³⁰ It was proposed that mention should be made of international organs of cooperation, for it was not sufficient to provide for cooperation at the request of a watercourse state.¹³¹ As to the suggestion for the development of an international standard to draw up the lists, the Special Rapporteur

drew attention to the list of environmentally harmful chemical substances and the definition of "hazardous wastes" prepared by UNEP. It might be possible to stipulate that the lists must be drawn up in accordance with internationally accepted standards, such as those contained in the 1973 and

1978 MARPOL Conventions and in the 1974 Paris Convention on the Prevention of Marine Pollution from Land-based Sources.¹³²

He said that there was "very little authority" in state practice for a provision to ban the introduction of toxic substances in an international watercourse, although he "could agree with those members" who suggested that this be done. He suggested that specific agreements could cover such a prohibition, since the identification of the banned substances might vary with each watercourse system. As an alternative approach he suggested a provision on the model of principle 8(d) of the set of principles adopted by in 1987 by ECE on cooperation in the field of transboundary waters.¹³³ Model principle 8(d) provides:

In the prevention and control of transboundary water pollution, special attention should be paid to hazardous substances, especially those which are toxic, persistent and bioaccumulative, whose introduction into transboundary waters should be prohibited or at least prevented by using the best available technology; such pollutants should be eliminated within a reasonable period of time.¹³⁴

The drafting committee left the essence of the originally drafted article intact with one change under which it separated the introduction of species into a new article, article 22, which is next the subject of the comments here.

C. ARTICLE 22

Article 22 states that watercourse states "shall take all measures necessary to prevent the introduction of species, alien or new, into an international watercourse which

may have effects detrimental to the ecosystem of the watercourse resulting in appreciable harm to other watercourse States."

The commentary accompanying this article explains that this new article was added to fill a gap left by the definition of pollution in article 21, since that definition did not include biological alterations. Under this article, watercourse states are obligated to take "all measures necessary" to prevent the introduction of alien or new species into an international watercourse.

The obligation to prevent is aimed at the introduction of such species which may detrimentally affect the ecosystem of the watercourse, and the threshold is reached when "appreciable harm" to other watercourse states results. The obligation is that of due diligence. Thus all that is required of a watercourse state is to do "all that can reasonably be expected to prevent the introduction of such species."¹³⁵

First, as noted in the commentary, the introduction of such species of flora or fauna into a watercourse can upset its ecological balance and result in serious problems including the clogging of intakes and machinery, the spoiling of recreation, the acceleration of eutrophication, the disruption of food webs, the elimination of other, often valuable species, and the transmission of disease. Once introduced, alien and new species can be highly difficult to eradicate.¹³⁶

It must be the growing awareness of this danger to which can be attributed a trend in international conservation agreements to provide for the control of both the deliberate and accidental introduction of such species. WCED's experts group cited the

examples of 1976 Asia Convention on Conservation of Nature in the South Pacific and the 1979 Berne Convention on the Conservation of European Wildlife and Natural Habitats.¹³⁷ The U.N. Law of the Sea Convention specifically provides that states "shall take all necessary measures to prevent, reduce and control . . . the intentional or accidental introduction of species, alien or new, which may cause significant and harmful changes thereto."¹³⁸

Second, the commentary clarifies certain terms, such as "alien" referring to non-native species, and "new" encompassing species produced or altered through biological engineering.¹³⁹ As the article addresses the introduction of such species only in the watercourse itself, fish farming or other activities conducted outside the watercourse are not covered.

Anticipating the inquiry as to a state's obligation to prevent any alien or new species entering into the watercourse as a result of such activities, the commentary adds in a footnote that "[a]ppropriate precautionary measures may be required," to prevent this from happening.¹⁴⁰ This explanation is unnecessarily confusing. Does not a state's obligation to take the necessary measures to prevent the introduction of such species into the watercourse cover both the "direct" and "indirect" introduction of such species? If so, why give this "indirect" introduction obligation an appearance of an after thought?

Third, the legal obligation in article 22 is kept in harmony with the general rule in article 7 pertaining to a watercourse state's obligation not to cause "appreciable harm" to other watercourse states. What is contemplated is the inclusion of the environment of such states as well. Also, as in prior articles, both individual and joint preventive action

may be called for.¹⁴¹

Two points seem pertinent. One, it is not clear as to when a "detrimental" effect is to be determined. Some effects will not be seen or evidenced immediately. Second, since such species may severely disrupt the ecosystem of the watercourse as of a watercourse state, this is one article where the Commission's task of providing "progressive development of international law" should lead it to explore seriously the use of strict liability.

D. ARTICLE 23

Watercourse States shall, individually or jointly, take all measures with respect to an international watercourse that are necessary to protect and preserve the main environment, including estuaries, taking into account generally accepted international rules and standards.

At the 1988 session of the International Law Commission when the initial Draft of this article, which then constituted paragraph 2 of article 7, a suggestion was made by Mr. Yanko for a separate article on the subject.¹⁴² He offered two reasons for his suggestion: (1) "to bring out the question involved," and (2) "because the main sources of the marine environment were rivers, canals and like, and because the provision should state the obligation of State to take all appropriate measures to protect the marine environment, including estuaries or mouths of rivers which flowed directly into the sea."¹⁴³

The Special Rapporteur accepted the suggestion,¹⁴⁴ as he did some other suggestions, such as adding the words "and preserve" between "protect" and the "marine

environment," specially referring to the U.N. Convention on the Law of the Sea, and providing that the mouths of rivers were covered.¹⁴⁵

The commentary refers to the pertinent provisions of the 1982 U.N. Convention on the Law of the Sea¹⁴⁶ and to several regional seas conventions which recognize state obligation not to cause pollution damage to the marine environment from land-based sources.¹⁴⁷ His commentary explains that state obligation under this article is

separate from, and additional to, the obligations set forth in articles 20 to 22. Thus a watercourse State could conceivably damage an estuary through pollution of an international watercourse without breaching its obligation not to cause appreciable harm to other watercourse States. Article 23 would require the former watercourse State to take the measures necessary to protect and preserve the estuary.¹⁴⁸

The commentary also explains that the phrase "generally accepted international rules and standards"

refers both to rules of general international law and to those derived from international agreements, as well as to standards adopted by States and international organizations pursuant to those agreements. Watercourse States are to take these rules and standards into account in planning and implementing the measures to be taken under the present article, with a view to ensuring that such measures are consistent with any applicable rules and standards governing protection and preservation of the marine environment.¹⁴⁹

Even if the article were, to a large extent, to be viewed as a reaffirmation of the existing state obligations under prior conventions, its inclusion as a separate article is a recognition of how serious the adverse effects of the pollution of international watercourses can be on the marine environment. The article also attempts to harmonize the law of international watercourses and the law of the sea on this important subject.

E. ARTICLE 24

Article 24 addresses prevention and mitigation of harmful conditions by watercourse states. This article originally was proposed in 1988, together with article 25, as part of a draft article addressing "pollution or environmental emergencies."¹⁵⁰ As a result of discussion of that draft, the Special Rapporteur split the article into its present form, a form which was initially adopted by the ILC in 1990.¹⁵¹ The obligation contained in article 24 to prevent and mitigate harmful conditions was not explicitly addressed in that earlier draft, and so remains relatively unexplored as to its implications.

For example, the WCED Legal Experts on Environmental Law did not include such an "anticipatory" article in their legal principles on environmental protection and sustainable development.¹⁵² They did, however, include a more cumbersome version of article 25 dealing with emergencies. Yet that article requires either "a significant risk" of harm or the actual "causing [of] substantial harm," in a manner analagous to article 25 of the ILC's 1991 draft articles, discussed below.

Article 24 mandates that watercourse states "shall . . . take all appropriate measures to prevent or mitigate conditions that may be harmful to other watercourse States." As discussed by the ILC, the reason for the mandatory nature of the language is

that "there is no doubt that [the problems addressed by the article] are of serious consequence for watercourse States."¹⁵³

The mandatory nature of the article is softened by the qualification that the watercourse State need only "take all appropriate measures." The ILC makes clear that "all appropriate measures" means that watercourse states "are to take measures that are tailored to the situation involved, and that are reasonable in view of the circumstances of the watercourse State in question."¹⁵⁴ As a consequence, the analysis of what the appropriate measures are will, necessarily, focus on the specific factual context. A balancing between the seriousness and magnitude of the harmful condition with the capabilities of the watercourse State appears to be called for by the ILC in determining what the appropriate measures might be.

The ILC describes the standard to be used to determine the obligation arising under this article in two slightly differing fashions. First, the ILC states that "all appropriate measures" means "reasonable in view of the circumstances," before going on to articulate a slightly higher standard: "[t]he obligation is [to] exercise [the watercourse State's] best efforts."¹⁵⁵ Presumably, these standards are to fit together in a complementary fashion, such that, based upon a particular set of circumstances, a given watercourse state is obligated to exercise its best efforts.

The appropriate measures called for in article 24 are to be directed towards preventing or mitigating the conditions that may be harmful. The commentary highlights the fact that the verbs "prevent" and "mitigate" are "of an anticipatory nature."¹⁵⁶ The article reinforces the anticipatory nature of the obligation by including language that

requires some measure of risk assessment by watercourse states. The article states that the conditions for which watercourse states shall take all appropriate measures to prevent or mitigate are those "that may be harmful." Certainty is not required before the obligation arises.

Although the commentary does not address this issue, presumably the level of harm which triggers the obligation must rise to the level of "appreciable harm" that is used elsewhere in the draft articles. The ILC makes clear that the source of the harm, whether naturally caused or related to human conduct, does not obviate the obligation, stating "[t]he conditions dealt with in article 24 may result from natural causes, human conduct, or a combination of the two."¹⁵⁷ As examples, the ILC notes that floods and siltation may result from deforestation coupled with heavy rains or a flood may be caused by earthquake damage to a dam.¹⁵⁸ Furthermore, the ILC notes that the examples listed in the article are intended to be just that, stating: "[t]he list of conditions provided at the end of the article is non-exhaustive."¹⁵⁹

Finally, the article leaves the kinds of appropriate measures that shall be undertaken undefined. The commentary on article 24 states in paragraph (5) that these measures "are many and varied. They range from the regular and timely exchange of data and information . . . to taking all reasonable steps to ensure that activities . . . are so conducted as not to cause conditions that may be harmful to other watercourse States." In so providing this flexibility, the ILC has again emphasized the contextual nature of the obligation laid down in this article.

F. ARTICLE 25

The bulk of article 25 addresses those instances where the anticipatory prevention and mitigation called for in article 24 have not been effective, resulting in an "emergency" that "causes, or poses an imminent threat of causing, serious harm to watercourse States or other states." As the ILC notes, the obligation contained in the first three paragraphs of article 25 call for responsive action, rather than anticipatory action.¹⁶⁰

The article is divided into four paragraphs, with the first devoted to a definition of the term "emergency," the second and third addressing responses to emergencies and the fourth focusing on contingency planning for emergencies. Paragraph 1 of article 25 defines the term "emergency," as quoted above. The ILC points out that "[t]he seriousness of the harm involved, together with the suddenness of the emergency's occurrence, justifies the measures required by [paragraphs 2 and 3 of] the article."¹⁶¹ As did article 24, paragraph 1 of article 25 also makes clear that the source of the emergency, whether from natural causes or human conduct, does not change the obligations laid down in the article.

What is not made clear in paragraph 1, nor in the commentary, is whether the definition of emergency provided would include emergencies that are not related to the international watercourse, but which, nonetheless, cause or pose an imminent threat of causing serious harm to watercourse States or other States. The example which comes to mind is Chernobyl, where the radioactive fallout was transported primarily through the atmosphere and not by water. While the intent of article 25 seems to be to address water-borne harms, the literal reading of the language of article 25 would seem to allow

its application to harms transported by other mediums.¹⁶² Such an expansive reading of the article would need to be carefully coordinated with other applicable international agreements.

Indeed, a review of the ILC discussion of the original draft of this article makes clear that the ILC intended an expansive reading of the term "emergency". The Special Rapporteur, in summarizing the discussion of the original draft language "noted that most speakers had agreed that a comprehensive article dealing with all kinds of emergency situations, not only those related to the environment, should be included."¹⁶³

Paragraphs 2 and 3 of article 25 set forth the specific measures which result from the obligation laid down by the article. Paragraph 2, which addresses the notification requirement, provides that "[a] watercourse State shall, without delay and by the most expeditious means available, notify other potentially affected States and competent international organizations of any emergency originating within its territory." As the ILC points out, "[t]he words 'without delay' mean immediately upon learning of the emergency, and the phrase "'by the most expeditious means available' means that the most rapid means of communication that is accessible is to be utilized."¹⁶⁴ Significantly, paragraph 2 of article 25 also extends the obligation of who must be notified beyond watercourse States to non-watercourse States and "competent international organizations."

While paragraph 2 addresses the manner of notification, paragraph 3 of article 25 delineates the nature of the measures required to be undertaken in the event of an emergency. The language in paragraph 3 which accomplishes this states that a

watercourse state shall take "immediately all practicable measures necessitated by the circumstances." The ILC clarifies that "all practicable measures" means "those that are feasible, workable and reasonable."¹⁶⁵ As with article 24, these measures are to be contextually defined by "the factual situation of the emergency and its possible effect upon other States."¹⁶⁶

The final paragraph of article 25 is of an anticipatory nature, as opposed to the responsive character noted above for the first three paragraphs of the article. This paragraph lays down the obligation of watercourse States, "where necessary," to "develop contingency plans for responding to emergencies". The ILC clarifies the qualifying phrase "when necessary," stating,

that the circumstances of some watercourse States and international watercourses may not justify the effort and expenses that are involved in the development of contingency plans. Whether such plans would be necessary would depend, for example, upon whether the characteristics of the natural environment of the watercourse, and the uses made of the watercourse and adjacent land areas, would indicate that it was possible for emergencies to arise.¹⁶⁷

This qualification is not intended as an excuse for not undertaking the contingency planning, as the ILC notes "that with respect to most international watercourses in the world today, the development of contingency plans would be advisable, if not strictly necessary."¹⁶⁸

G. ARTICLE 29

Article 29 reads: "International watercourses and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and internal armed conflict and shall not be used in violation of those principles and rules."

As the commentary states, the article does not amend or alter existing law; its principal function is to remind states that the law of armed conflicts applies both to the protection of international watercourses and works and to their use.¹⁶⁹ The article is addressed to all states, not just watercourse states. However, it "does not purport to extend the application of any instrument to States not parties to that instrument."¹⁷⁰

The commentary illustrates how the rules and principles governing armed conflict are applicable under the article. It specifically refers to the 1907 Hague Conventions, pertinent articles of the 1977 Protocols I and II Additional to the 1949 Geneva Conventions, and in cases not covered by a specific rule, to the protections afforded under the "Martens Clause."¹⁷¹

Assuming that the provisions of this article were included in a framework convention to which Iraq was a party, and assuming further that Iraq had also acceded to the 1977 Protocols, Iraq would have been in breach of its obligations under this article by its having caused massive oil spills in the Gulf.¹⁷² The article, however, does not purport to add anything substantive or procedural to Iraq's obligations for its conduct or for the result of such conduct.

Granted that the subject is of "signal importance," as the commentary states.¹⁷³

However, one has to question the usefulness of including this article in this framework convention.

III. CONCLUSION

(A 2 to 3 page appraisal of the ILC contribution toward "progressive development of international law" on the subject will constitute the concluding part.)

*Thompson G. Marsh Professor of Law
Director, International Legal Studies Program
University of Denver College of Law

I gratefully acknowledge the research assistance of Bruce Bailey, Esq., J.D., University of Denver College of Law, Ph.D. student and Ford Fellow at the Graduate School of International Studies at the University of Denver.

ENDNOTES

1. Statute of the International Law Commission, art. 1, para. 1, U.N. Doc. A/CN.4/4/Rev. 2 (1982).
2. For a detailed discussion of the history of the International Law Commission's efforts in this area, see McCaffrey, International Organizations and the Holistic Approach to Water Problems, 31 NAT. RES. J. 139 (1991).
3. See Draft Articles on the Law of the Non-navigational Uses of International Watercourses and Commentaries Thereto Adopted by the International Law Commission on First Reading, 1991, para. 2 of the commentary on art. 20 [hereinafter ILC 1991 Draft].
4. [1988] II. Y.B. INT'L L. COMM'N, pt. 2 [hereinafter 1988 ILC Yearbook Summary].
5. See draft art. 17 in id.
6. See id., at para. 176.
7. See, for example, the comments of the Soviet delegate to the ILC, in [1988] 1 Y.B. INT'L L. COMM'N, 160, para. 13 [hereinafter 1988 ILC Y.B.].
8. Id., at 165, para. 64.
9. Tansley, The Use and Abuse of Vegetational Concepts and Terms, 16 ECOLOGY 284, 299 (1935). (emphasis in original).
10. Lindeman, The trophic-dynamic aspect of ecology, 23 ECOLOGY 399, 400 (1942). (emphasis in original).
11. P. EHRLICH, A. EHRLICH, AND J. HOLDEN, ECOSCIENCE: POPULATION, RESOURCES, ENVIRONMENT 97 (1977), quoted in Teclaff and Teclaff, International Control of Cross-Media Pollution -- an Ecosystem Approach, 27 NAT. RES. J. 21, n. 2 (1987).
12. ILC 1991 Draft, supra note 3, para. 2 of the commentary to article 20.

13. E. ODUM, FUNDAMENTALS OF ECOLOGY 6 (2d ed. 1959).
14. See generally Schultz, The Ecosystem as a Conceptual Tool in the Management of Natural Resources, 139-161, at 141, in NATURAL RESOURCES: QUALITY AND QUANTITY: PAPERS PRESENTED BEFORE A FACULTY SEMINAR AT THE UNIVERSITY OF CALIFORNIA, BERKELEY, 1961-1965 (S.V. Ciriacy-Wantrup and J.J. Parsons eds.(1967).
15. Caldwell, The Ecosystem as a Criterion for Public Land Policy, 10 NAT. RES. J. 203 (1970).
16. Keiter, NEPA and the Emerging Concept of Ecosystem Management on the Public Lands, 24 LAND & WATER L. REV. 43, 44 (1990).
17. See, e.g., OECD, THE STATE OF THE ENVIRONMENT 69 (1991).
18. THE WORLD ENVIRONMENT 1972-1982: A REPORT BY THE UNITED NATIONS ENVIRONMENT PROGRAM 124 (M. Holdgate, M. Kassas and G. White eds. 1982).
19. ILC 1991 Draft, supra note 3, para. 6 of the commentary to article 20.
20. Article II, T.I.A.S. No. 9257 (1978).
21. Done May 7, 1980, T.I.A.S. No. 8826, reprinted in 19 I.L.M. 841 (1980).
22. G.A. Res. 7, 36 U.N. GAOR Supp. (No. 51) at 17, U.N. Doc. A/51 (1982).
23. The word "eco-systems" is used in The Convention for the Prevention of Marine Pollution From Land-Based Sources, art. I, reprinted in 13 I.L.M. 352 (1974); yet, it is not clear that the term was used in that context in a manner consistent with the definitions discussed in this paper. The only use of the term occurs in Article I, where the Convention speaks of avoidance of pollution that would cause, among other things, harm to "marine eco-systems."
24. Indicative of this dearth of usage at the level of international agreements is the absence of the term in the discussion of international environmental law contained in the ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW, North-Holland (1986). See also R. BOARDMAN, INTERNATIONAL ORGANIZATION AND THE CONSERVATION OF NATURE 62-67 (1981).
25. See generally Keiter, supra note 16.
26. ILC 1991 Draft, supra note 3, para. 9 of the commentary to article 20.
27. E. ODUM, supra note 13, at 11.

28. E. Vlachos, *The Challenges of Transboundary River Basins, The Management of International River Basin Conflicts* (Sept. 22-25, 1986) (paper presented at the Workshop on Management of International River Conflicts, International Institute for Applied Systems Analysis, Laxenburg, Austria), cited in Linnerooth, *The Danube River Basin: Negotiating Settlements to Transboundary Environmental Issues*, 30 NAT. RES. J. 629, 630 (1990).

29. ILC 1991 Draft, supra note 3, para. 2 of the commentary to article 20.

30. Id.

31. Id., para. 5 of the commentary to article 2.

32. *Ground Water in Eastern and Northern Europe*, U.N. Doc. ST/TCD/11 (1990).

As to the general lack of information regarding ground water resources in developing country, see *Development and Conservation of Ground-Water Resources and Water-Related Natural Disasters and Their Mitigation*, U.N. Doc. ST/ESCAP/Ser.F/66.

For a survey of the general state of the law of transboundary groundwater, see Barberis, *The Development of International Law of Transboundary Groundwater*, 31 NAT. RES. J. 167 (1991).

33. In the U.S., one wildlife refuge has been closed as a result of selenium poisoning of migratory birds. The selenium leached into the refuge's waters from farmland adjacent to the river which flowed into the refuge. See Comment, *The Migratory Bird Treaty Act -- Protecting Wildlife in Our National Refuges -- California's Kesterson Reservoir, a Case in Point*, 26 NAT. RES. J. 609 (1986).

34. ILC 1991 Draft, supra note 3, para. 5 of the commentary to article 7.

35. See McCaffrey, supra note 2.

36. E. ODUM, supra note 13, at 11. In this regard, the definition provided by the Experts Group on Environmental Law of the World Commission on Environment and Development, that an ecosystem is a system of plants, animals and micro-organisms together with the non-living components of their environment, is perhaps closer to the true sense of the concept than the definition provided in the commentary.

ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT --
LEGAL PRINCIPLES AND RECOMMENDATIONS, commentary to article 3 (1986)
[hereinafter Legal Principles].

37. The "appreciable harm" standard set forth in article 7 would also serve to address this concern, as not just any harm is subject to the articles. The harm must be appreciable.

38. ILC 1991 Draft, supra, note 3, para. 2 of the commentary to article 20, quoting "Ecosystems approach to water management", para.224, U.N.Doc. ENVWA/WP.3/R.7/Rev. 1.

39. ILC 1991 Draft, supra note 3, para. 2 of the commentary to article 20.

40. E. ODUM, supra, note 13, at 487.

41. The spotted owl situation in the Pacific northwest revolves around both the protection to be afforded to the old growth ecosystem and the extent to which a non-human species' habitat requirements should impact human communities. See generally Bonnett and Zimmerman, Politics and Preservation: The Endangered Species Act and the Northern Spotted Owl, 18 ECOLOGY L. Q. 105 (1991).

42. The ILC explicitly recognizes this change, as it notes that "increasing human populations place ever greater demands on finite water resources." ILC 1991 Draft, supra note 3, para. 2 of the commentary to article 20.

43. Id., para. 3 of the commentary to article 20.

44. See, for example, id. at para. (4) of the commentary to article 21.

45. Id., para. 3 of the commentary to article 20.

46. See generally UNITED NATIONS, GLOBAL OUTLOOK 2000: AN ECONOMIC, SOCIAL AND ENVIRONMENTAL PERSPECTIVE (1990); WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE (1987), especially Part II. Specifically, as to the off-site costs associated with soil erosion, including impacts to watercourses, see The Off-Site Costs of Soil Erosion, Proceedings of a Symposium Held in May 1985 (T. Waddell ed. (1986).

47. ILC 1991 Draft, supra note 3, para. 2 of the commentary to article 20.

48. The ILC points out that the scope of the draft articles "is meant to embrace not only measures taken to deal with degradation of water quality, . . . , but also those aimed at solving other watercourse problems, such as those relating to . . . flood control". Id., para. 3 of the commentary to article 1. Yet there is no such specific reference in the commentary on article 20.

49. See generally Reisner and McDonald, The High Costs of High Dams, in BORDERING ON TROUBLE: RESOURCES & POLITICS IN LATIN AMERICA, 270 (A. Maguire and J. Welsh Brown eds. 1986); Scudder, The Need and Justification for Maintaining Transboundary Flood Regimes: The Africa Case, 31 NAT. RES. J. 75 (1991); Krolopp-Kirn and Marts, The Skagit-High Ross Controversy: Negotiation and Settlement, 26 NAT. RES. J. 261 (1986); Linnerooth, supra note 28.

50. OECD, supra note 17, at 65.
51. See generally Springer, Toward a Meaningful Concept of Pollution in International Law, 26 INT'L & COMP. L. Q. 531 (1977); J. LAMMERS, POLLUTION OF INTERNATIONAL WATERCOURSES 7-17 (1984).
52. J. BARROS & D. M. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION 3 (1974).
53. See ILA, Report of the Fifty-Second Conference, Helsinki, August 14-20, 1966, at xi, 484-533 (1967).
54. See id. at 494-505.
55. Id. at 494.
56. Id. at 495.
57. Id. at 496 (emphasis added).
58. See id. at 496-501.
59. Id. at 499.
60. See id. at art. X(1).
61. See ILA, Report of the Fifty-Fifth Conference, New York, 1972, at 100 (art. 2) (1974) (emphasis added).
62. See id. at 101.
63. See ILA, Report of the Sixtieth Conference, Montreal, 1982, at 535 (art. 1 (a) and (b)).
64. Reprinted in 13 INT'L LEG. MAT. 544, 547 (1974) (art. 2).
65. Reprinted in 15 INT'L LEG. MAT. 290 (1976) (art. 2(a)).
66. Reprinted in 13 INT'L LEG. MAT. 352, 353 (1974) (art. 1 (1)).
67. See (art. 1(1)(4)) U.N. Doc. A/CONF. 62/122, Oct. 7, 1982, reproduced in 21 INT'L LEG. MAT. 1261, 1271 (1982).
68. See Declaration of the United Nations Conference on the Human Environment, in Report of the United Nations Conference on the Human Environment (Stockholm, 5-16 June 1972), U.N. Doc. A/CONF. 48/14/ Rev. 1, at 2, 7 (1972), reprinted in 11 INT'L LEG. MAT. 1416, 1420 (1972) [hereinafter Stockholm Report].

69. ILC 1991 Draft, supra note 3, article 21, para. 2.
70. See, e.g., J. LAMMERS, supra note 51, at 9-10.
71. See ILC 1991 Draft, supra note 3, para. 2 of the commentary to article 21.
72. See id.
73. See id., article 5 and the commentary, especially para. 9, which states:

In many cases, the quality and quantity of water in an international watercourse will be sufficient to satisfy the needs of all watercourse States. But where the quantity or quality of the water is such that all the reasonable and beneficial uses of all watercourse States cannot be fully realized, a "conflict of uses" results. In such a case, international practice recognizes that some adjustments or accommodations are required in order to preserve each watercourse State's equality of right. These adjustments or accommodations are to be arrived at on the basis of equity, and can best be achieved on the basis of specific watercourse agreements. (Footnote omitted.)

74. Davis, Protecting Waste Assimilation Streamflows by the Law of Water Allocation, Nuisance, and Public Trust, and by Environmental Statutes, 28 NAT. RES. J. 357, 358 (1988) (footnote omitted).
75. See supra note 67.
76. See n. 268 in the commentary and accompanying text (footnote renumbered). See also article 24 and the commentary.
77. See n. 269 and accompanying text in the commentary (footnote renumbered). See also article 24 and the commentary.
78. See supra note 63, art. 1.
79. See id. at 536.
80. LEGAL PRINCIPLES, supra note 36, at 75.
81. See id. at 80.
82. See United Nations Convention on the Law of the Sea, done at Montego Bay, Dec. 10, 1982, U.N. Doc. A/CONF. 62/122 (1982), art. 1 (4) [hereinafter 1982 UNCLOS], which defines pollution of the marine environment to mean

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.

83. See supra notes 76-77 and accompanying text.
84. See ILC 1991 Draft, supra note 3, para. 6 of the commentary to article 21.
85. See id. n. 275.
86. See id.
87. See e.g., supra notes 65-70 and accompanying text.
88. See ILC 1991 Draft, supra note 3, art. 3 (2) (emphasis added).
89. See id., paras. 14-15 of the commentary to article 3.
90. See id., para. 15 of the commentary. See also id., article 4(2) and para. 7 of the commentary to that article (application of the term "appreciable" to the right of a watercourse state whose use of an international watercourse may be affected to an appreciable extent by the implementation of a proposed watercourse agreement that applies only to a part of the watercourse or to a particular project, programme or use" to participate in consultations and negotiations pertaining to such an agreement).
91. See id., paras. 14, 19-20 of the commentary to article 3.
92. Cited id., para. 14 to the commentary to article 3.
93. See id., para. 1 of the commentary to article 7.
94. See id., para. 4.
95. Id., para. 5 (footnote omitted).
96. See supra notes 53-56.
97. See A.L.I., 2 RESTATEMENT (3RD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES § 601 (1) and (2), at 103 [hereinafter RESTATEMENT].
98. See Report of the International Law Commission on the Work of Its Fortieth Session, U.N. GAOR Supp. (No. 10), U.N. Doc. A/43/10, at 28 (1988) [hereinafter 1988 ILC Rep.]; McCaffrey, The Law of International Watercourses: Some Recent Developments and Unanswered Questions, 17 DEN. J. INT'L L. & POL'Y 505, 518

(1989). The WCED's Experts Group on Environmental Law uses the term "harm." See infra note 106. The Convention on the Regulation of Antarctic Mineral Resources Activities uses the standard of "adverse effect." See 27 INT'L LEG. MAT. 868, 871 (1988) (art. 4, Para. 2(a)). The U.N. Convention on the Law of the Sea uses the term "damage." See 1982 UNCLOS, supra note 82 art.

99. See ILC 1991 Draft, supra note 3, para. 6.

100. See id., para. 7.

101. See supra notes 53-60 and accompanying text.

102. See supra note 63 and accompanying text.

103. Id. at 535.

104. LEGAL PRINCIPLES, supra note 36, at 75 (art. 10); 75-80 (Comment to art. 10).

105. See supra note 90 and accompanying text.

106. See supra note 95 and accompanying text.

107. Supra note 90.

108. See 1982 UNCLOS, supra note 82, art. 194, para. 1.

109. ILC 1991 Draft, supra note 3, para. 3 of the commentary to article 21.

110. Id.

111. Id. (footnote omitted).

112. Id. (footnotes omitted).

113. See ILC, 40th Sess. (Geneva, 9 May-20 July 1988), Fourth Report on the Law of the Non-navigational Uses of International Watercourses, U.N. Doc. A/CN. 4/412/Add. 2, para. 11, at 12-13 (1988) [hereinafter Fourth Report].

114. See 1988 ILC Rep., supra note 98 at 29-31. For extensive discussion on the topic, see generally 1988 ILC Y.B., supra note 7, at 121-64.

115. Id. at 153 (Mr. Pawlak).

116. See, e.g., id. at 127 (Mr. Calero Rodriguez); 141 (Mr. Shi and Mr. Arangio-Ruiz); 142 Mr. Reuter); 146 (Mr. Tomuschat); 147 (Mr. Al-Khasawneh); and 159-60 (Mr. Thiem). For the Special Rapporteur's summary of the criticism and his response, see id. at 164.

117. For the Special Rapporteur's summary, see id. at 163.
118. Id. at 164, para. 53.
119. Id. at 163, para. 48.
120. Id. at para. 49.
121. Supra note 63.
122. Id. at 538 (para. 10). See also supra note 53, at 503-04 (comment (d) to Helsinki Rule XI); art. 194, para. 2 of the U.N. Convention on the Law of the Sea, supra note 82.
123. See ILC 1991 Draft, supra note 3, at para. 6 of the commentary to article 21.
124. See id., para. 5.
125. See id., para 7 n. 276. For an extensive survey, see Fourth Report supra note 113, at paras. 39-48. For a still more extensive survey, see S. Schwebel, Third Report on the Law of the Non-navigational Uses of International Watercourses, [1982] 2 Y.B. INT'L L. COMM'N 65.
126. See 1982 UNCLOS, supra note 82, art. 194, para. 1.
127. See ILC 1991 Draft, supra note 3, para. 7 of the commentary to article 21.
128. See id.
129. Id., para. 8 of the commentary to article 21, especially at n. 278, 280.
130. See, e.g., 1988 ILC Y.B., supra note 7, at 130-31 (Mr. Graefrath); 135 (Mr. Ogiso); 137 (Mr. Sepulvada Gutierrez); 144 (Mr. Barsegov); 146 (Mr. Tomuschat); 147-48 (Mr. L-Khasawneh); 151 (Mr. S. Rao); 158 (Mr. Al-Qaysi); and 161 (Mr. Diaz Gonzalez).
131. See id. at 160 (Mr. Thiem).
132. Id. at 165, para. 60 (footnotes omitted).
133. See id. at para. 61.
134. U.N. Doc. E/ECE (42)/L. 19 at 18, cited in Fourth Report, supra note 113, at 27 para. 56.
135. ILC 1991 Draft, supra note 3, para. 3 of the commentary to article 22.
136. Id., at para. 1.

137. See LEGAL PRINCIPLES, supra note 36, at 49.
138. 1982 UNCLOS, supra note 82, art. 196.
139. See ILC 1991 Draft, para. 2 of the commentary to article 22.
140. See id., n. 287.
141. See id., at para. 4.
142. See 1988 ILC Y.B., supra note 7, at 155, para. 8. See also id. at 152, para. 58 (statement on marine pollution by Mr. Roncounas).
143. Id. at 155, para. 8.
144. See id. at 165, para. 62.
145. See id.
146. See id., at para. 65.
147. See ILC 1991 Draft, supra note 3, para. 1 n. 290 of the commentary to article 23.
148. Id. at para. 2.
149. Id., at para. 4 (footnote omitted).
150. For the full text of the 1988 draft article, see 1988 ILC Y.B. supra note 7 at 121.
151. ILC 1991 Draft, supra, note 3, para. 1 of the commentary on article 24.
152. See LEGAL PRINCIPLES, supra, note 36, article 19.
153. ILC 1991 draft, supra, note 3, para. 1 of the commentary on article 24.
154. Id., at para. 2.
155. Id., at para 2.
156. Id., at para. 1.
157. Id., at para. 3.
158. Id., n. 299.
159. Id., at para. 4.

160. Id., para. 1 of the commentary on article 25.
161. Id., at para. 2.
162. As to the issue of cross-media pollution, see generally Teclaff and Teclaff, supra, note 11.
163. 1988 ILC Y.B., supra, note 7, at 165.
164. ILC 1991 Draft, supra, note 3, para. 3 of the commentary on article 25.
165. Id., at para. 4.
166. Id., at para. 4.
167. Id., at para. 6.
168. Id.
169. See Id., at 3, paras. 1, 2 of the commentary on art. 29.
170. Id., at para. 2.
171. See id., at para. 3.
172. On the environmental impact of the Gulf War, see generally W. ARKIN, D. DURRANT & M. CHERNI, ON IMPACT: MODERN WARFARE AND THE ENVIRONMENT, A CASE STUDY OF THE GULF WAR (A Greenpeace Study, London, May 1991).
173. See ILC 1991 Draft, / , at para. 2.