

Chapter IV

SHARED NATURAL RESOURCES

A. Introduction

34. The Commission, at its fifty-fourth session (2002), decided to include the topic “Shared natural resources” in its programme of work and appointed Mr. Chusei Yamada as Special Rapporteur.⁹ A Working Group was also established to assist the Special Rapporteur in sketching out the general orientation of the topic in the light of the syllabus prepared in 2000.¹⁰ The Special Rapporteur indicated his intention to deal with confined transboundary groundwaters, oil and gas in the context of the topic and proposed a step-by-step approach beginning with groundwaters.¹¹

35. From its fifty-fifth (2003) to its fifty-ninth (2007) sessions, the Commission received and considered four reports from the Special Rapporteur.¹² During this period, the Commission also established four working groups: the first, in 2004, chaired by the Special Rapporteur, assisted in furthering the Commission’s consideration of the topic; the second, in 2005, chaired by Mr. Enrique Candioti, reviewed and revised the 25 draft articles on the law of transboundary aquifers proposed by the Special Rapporteur in his third report, taking into account the debate in the Commission; the third, in 2006, chaired by Mr. Enrique Candioti, completed the review and revision of the draft articles submitted by the Special Rapporteur in his third report, culminating in the completion, on first reading, of the draft articles on the law of transboundary aquifers (2006); the fourth, in 2007, chaired by Mr. Enrique Candioti, assisted the Special Rapporteur in considering a future work programme, in particular the relationship between aquifers and any future consideration of oil and gas, consequently agreeing with the proposal of the Special Rapporteur that the Commission should proceed to a second reading of the draft articles on the law of transboundary aquifers in 2008 and treat that subject independently of any future work by the Commission on oil and gas.

36. The Commission, at its fifty-eighth session (2006), adopted on first reading draft articles on the law of transboundary aquifers consisting of 19 draft articles,¹³ together

⁹ *Yearbook ... 2002*, vol. II (Part Two), p. 100, paras. 518–519. The General Assembly, in paragraph 2 of resolution 57/21 of 19 November 2002, took note of the Commission’s decision to include the topic “Shared natural resources” in its programme of work. See also General Assembly resolution 55/152 of 12 December 2000.

¹⁰ *Yearbook ... 2000*, vol. II (Part Two), annex, p. 141.

¹¹ *Yearbook ... 2002*, vol. II (Part Two), pp. 100–102, para. 520.

¹² First report: *Yearbook ... 2003*, vol. II (Part One), document A/CN.4/533 and Add.1; second report: *Yearbook ... 2004*, vol. II (Part One), document A/CN.4/539 and Add.1; third report: *Yearbook ... 2005*, vol. II (Part One), document A/CN.4/551 and Add.1; and fourth report: *Yearbook ... 2007*, vol. II (Part One), document A/CN.4/580.

¹³ At the 2885th meeting on 9 June 2006.

with commentaries thereto,¹⁴ and decided, in accordance with articles 16 to 21 of its statute, to transmit the draft articles, through the Secretary-General, to Governments for comments and observations, with the request that such comments and observations be submitted to the Secretary-General by 1 January 2008.¹⁵

B. Consideration of the topic at the present session

37. At the present session, the Commission had before it the fifth report of the Special Rapporteur (A/CN.4/591), containing a set of 20 draft articles on the law of transboundary aquifers for the consideration of the Commission on second reading. The Commission also had before it the comments and observations received from Governments on the draft articles adopted on first reading (A/CN.4/595 and Add.1).¹⁶ The Special Rapporteur introduced the fifth report at the 2956th meeting, on 5 May 2008 and the Commission considered it at its 2957th, 2958th and 2959th meetings, on 6, 7 and 8 May 2008, respectively. The debate focused primarily on the substantive consideration of the draft articles proposed by the Special Rapporteur, as well as on the form of the draft articles, taking into account draft article 20 on the relation to other conventions and international agreements proposed by the Special Rapporteur, and his recommendation that a two-step approach be followed with regard to the draft articles, consisting in the General Assembly: (a) taking note of the draft articles, to be annexed to its resolution and recommending that appropriate action by States be taken, and (b) deciding at a later stage on the possibility of concluding a convention on the topic.

38. At its 2958th and 2959th meetings, on 7 and 8 May 2008, respectively, the Commission decided to refer draft articles 1 to 13 and 14 to 20 contained in the fifth report to the Drafting Committee. Moreover, at the latter meeting, the Commission requested the Special Rapporteur to prepare a draft preamble, and at its 2965th meeting, on 21 May 2008, following its consideration of a note by the Special Rapporteur containing such a preamble (A/CN.4/L.722), the Commission decided to refer the draft preamble to the Drafting Committee.

¹⁴ At the 2903rd, 2905th and 2906th meetings on 2, 3 and 4 August 2006. See the draft articles with commentaries thereto adopted by the Commission on first reading in *Yearbook ... 2006*, vol. II (Part Two), p. 94, para. 76.

¹⁵ See the 2885th and 2903rd meetings on 9 June and 2 August 2006, respectively.

¹⁶ See also the topical summaries, prepared by the Secretariat, of the discussion held in the Sixth Committee of the General Assembly during its sixty-first (A/CN.4/577 and Add.1–2, section A (mimeographed; available on the Commission’s website, documents of the fifty-ninth session)) and sixty-second sessions (A/CN.4/588, section B (mimeographed; available on the Commission’s website, documents of the sixtieth session)).

1. RELATIONSHIP BETWEEN THE DRAFT
ARTICLES AND OTHER INSTRUMENTS

39. The proposal by the Special Rapporteur for the inclusion of a draft article 20,¹⁷ on the relation to other conventions and international agreements, was seen as related to the draft articles becoming a convention, a possible outcome envisaged in the two-stage approach he had also suggested. The Drafting Committee decided to omit draft article 20, in the main, it being considered that issues concerning the relationship with other instruments were linked to questions concerning final form. Accordingly, it was premature, having adopted a two-step approach (see section C below), for the Commission to address such issues, particularly considering also that questions of relationship raised a variety of policy considerations that were best left to negotiating parties to resolve. Such an article sought in part, on the basis of paragraph 1 of article 311 of the United Nations Convention on the Law of the Sea, to define the relationship between the present draft articles and other conventions and international agreements wholly or in part regulating matters concerning transboundary aquifers, as well as additionally clarifying the relationship between the present draft articles and the Convention on the Law of the Non-Navigational Uses of International Watercourses (hereinafter “1997 Watercourses Convention”), particularly in respect of a transboundary aquifer or aquifer system that was hydraulically connected to an international watercourse in such a way as to be subject to both the present draft articles and the 1997 Watercourses Convention.

40. The matters raised by the draft article were the subject of comments in the plenary and in the Drafting Committee, where the point was also made that the usefulness of such an article was not precluded by whether the draft articles became a convention. Accordingly, it was important that the Commission convey its views on the text in order to assist States in their future consideration of the issue. However, some members viewed this to be a matter that could only be dealt with on a conditional basis without taking a definitive position.

41. Paragraph 1 of the proposed article 20 was criticized for not saying much and leaving a lot to implication, not least that in the event of an inconsistency the provisions of the draft articles would prevail. However, in the present case, for some members it was not at all clear whether in all instances the draft articles would necessarily have priority. A number of policy choices needed to be made before deciding which option ought to be taken in the event that a binding instrument would be negotiated, including: (a) whether the draft articles were

¹⁷ Draft article 20 as proposed read as follows:

“Relation to other conventions and international agreements

“1. The present draft articles shall not alter the rights and obligations of the States parties which arise from other conventions and international agreements compatible with the present draft articles and which do not affect the enjoyment by other States parties of their rights or the performance of their obligations under the present draft articles.

“2. Notwithstanding the provisions of paragraph 1, when the States parties to the present draft articles are parties also to the Convention on the Law of the Non-navigational Uses of International Watercourses, the provisions of the latter concerning transboundary aquifers or aquifer systems apply only to the extent that they are compatible with those of the present draft articles.”

intended to override existing regional or other agreements, or (b) whether any future conventions ought to conform with the provisions of the present draft articles. It was recalled that article 311 of the United Nations Convention on the Law of the Sea emerged from a negotiating process which took into account policy imperatives specific to that Convention. A similar situation arose in the negotiation of the 1997 Watercourses Convention, whose articles 3 and 4 reflect a variety of choices developed in the negotiation.

42. On the relationship between the draft articles, in the event of their becoming a convention, and the 1997 Watercourses Convention, it was considered useful that such matter be dealt with. However, two viewpoints regarding a possible overlap emerged. One view countenanced that, from a legal perspective, no such overlap existed; such a conclusion was logical since the definition of an aquifer or aquifer system for purposes of the present draft articles covered essentially “confined groundwaters” and in any event did not include the discharge zone. In contrast, article 2 (a) of the 1997 Watercourses Convention defined a watercourse for the purposes of that convention as a system of surface waters and groundwaters constituting “by virtue of their physical relationship a unitary whole and normally flowing into a common terminus”.¹⁸ Moreover, the prior discussions of the Commission with water experts seemed to confirm that the term “aquifer” applied to a body of water that was independent and did not contribute water directly to a common terminus through a river system or receive a significant amount of water from any extant surface water body. To confirm that two separate legal regimes were contemplated as covered by the two instruments, it would be important to reflect such an understanding in a preamble to the draft articles or, at the very least, the Commission should refrain from conveying in the commentary a message that an overlap existed.

43. The other view pointed to the possibility that such overlap could not be disregarded. It was noted that article 2 (a) of the 1997 Watercourses Convention offered a definition of watercourse that encompassed some groundwaters and that, in the negotiation of the 1997 Watercourses Convention, there was no discussion regarding the hydrological link, and it would therefore be difficult to exclude any overlap particularly in situations where not all aquifers were “confined”. The Commission, in its 1994 resolution on confined groundwaters,¹⁹ adopted on the completion of the draft articles,²⁰ which led to the adoption of the 1997 Watercourses Convention, commended States to be guided by the principles contained in the draft articles on the law of the non-navigational uses of international watercourses, where appropriate, in regulating transboundary groundwaters. Accordingly, there could be instances where two States sharing an aquifer would be governed one by the Convention and another by the present draft articles, in which case a conflict existed.

¹⁸ Article 2 (a) of the 1997 Watercourses Convention reads: “‘Watercourse’ means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.”

¹⁹ *Yearbook ... 1994*, vol. II (Part Two), p. 135, para. 222.

²⁰ *Ibid.*, pp. 89–135.

44. On whether the draft articles should have priority over the 1997 Watercourses Convention, some members noted that such a presumption of priority was merited because of the nature of the present draft articles as a special regime in dealing with aquifers. Some other members observed that it may not always be the case that the provisions of the draft articles would have priority.

45. In addition to dealing with other conventions and international agreements, the point was made that it would be necessary to address particular relationships with existing and future bilateral and regional agreements. Equally important would be to address the question of the settlement of disputes, and it was proposed that an article on this matter be considered.

2. ADOPTION OF THE DRAFT ARTICLES AND COMMENTARIES THERETO

46. At its 2970th and 2971st meetings, on 3 and 4 June 2008, the Commission received the report of the Drafting Committee (A/CN.4/L.724*), and at the latter meeting adopted a preamble and an entire set of 19 draft articles on the law of transboundary aquifers (see section E.1 below).

47. At its 2989th to 2991st meetings on 4 and 5 August 2008, the Commission adopted the commentaries to the aforementioned draft articles (see section E.2 below).

48. In accordance with its statute, the Commission submits the draft articles to the General Assembly, together with the recommendation set out below (see section C below).

C. Recommendation of the Commission

49. At its 2991st meeting, on 5 August 2008, the Commission decided, in accordance with article 23 of its statute, to recommend to the General Assembly:

(a) to take note of the draft articles on the law of transboundary aquifers in a resolution, and to annex these articles to the resolution;

(b) to recommend to States concerned to make appropriate bilateral or regional arrangements for the proper management of their transboundary aquifers on the basis of the principles enunciated in these articles;

(c) to also consider, at a later stage, and in view of the importance of the topic, the elaboration of a convention on the basis of the draft articles.

D. Tribute to the Special Rapporteur, Mr. Chusei Yamada

50. At its 2991st meeting, on 5 August 2008, the Commission adopted the following resolution by acclamation:

“The International Law Commission,

“Having adopted the draft articles on the law of transboundary aquifers,

“Expresses to the Special Rapporteur, Mr. Chusei Yamada, its deep appreciation and warm congratulations for the outstanding contribution he has made to the preparation of the draft articles through his tireless efforts and devoted work, and for the results achieved in the elaboration of the draft articles on the law of transboundary aquifers.”

51. The Commission also acknowledged the untiring efforts of the Special Rapporteur during the development of the topic in organizing various briefings by experts on groundwaters from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Economic Commission for Europe (UNECE) and the International Association of Hydrogeologists. In this connection, the Commission also noted that the International Association of Hydrogeologists honoured the Special Rapporteur with a distinguished associate membership award for his outstanding contribution to the field.

52. The Commission also expressed its deep appreciation to Mr. Enrique Candioti, as Chairperson for several years of the Working Group on shared natural resources, for his significant contribution to the work on the topic.

E. Draft articles on the law of transboundary aquifers

1. TEXT OF THE DRAFT ARTICLES

53. The text of the preamble and draft articles adopted, on second reading, by the Commission at its sixtieth session is reproduced below.

THE LAW OF TRANSBOUNDARY AQUIFERS

...

Conscious of the importance for humankind of life-supporting groundwater resources in all regions of the world,

Bearing in mind Article 13, paragraph 1 (a), of the Charter of the United Nations, which provides that the General Assembly shall initiate studies and make recommendations for the purpose of encouraging the progressive development of international law and its codification,

Recalling General Assembly resolution 1803 (XVII) of 14 December 1962 on permanent sovereignty over natural resources,

Reaffirming the principles and recommendations adopted by the United Nations Conference on Environment and Development of 1992 in the Rio Declaration on Environment and Development and Agenda 21,

Taking into account increasing demands for freshwater and the need to protect groundwater resources,

Mindful of the particular problems posed by the vulnerability of aquifers to pollution,

Convinced of the need to ensure the development, utilization, conservation, management and protection of groundwater resources in the context of the promotion of the optimal and sustainable development of water resources for present and future generations,

Affirming the importance of international cooperation and good neighbourliness in this field,

Emphasizing the need to take into account the special situation of developing countries,

Recognizing the necessity to promote international cooperation,

...

PART I

INTRODUCTION

Article 1. Scope

The present draft articles apply to:

- (a) utilization of transboundary aquifers or aquifer systems;
- (b) other activities that have or are likely to have an impact upon such aquifers or aquifer systems; and
- (c) measures for the protection, preservation and management of such aquifers or aquifer systems.

Article 2. Use of terms

For the purposes of the present draft articles:

- (a) “aquifer” means a permeable water-bearing geological formation underlain by a less permeable layer and the water contained in the saturated zone of the formation;
- (b) “aquifer system” means a series of two or more aquifers that are hydraulically connected;
- (c) “transboundary aquifer” or “transboundary aquifer system” means respectively, an aquifer or aquifer system, parts of which are situated in different States;
- (d) “aquifer State” means a State in whose territory any part of a transboundary aquifer or aquifer system is situated;
- (e) “utilization of transboundary aquifers or aquifer systems” includes extraction of water, heat and minerals, and storage and disposal of any substance;
- (f) “recharging aquifer” means an aquifer that receives a non-negligible amount of contemporary water recharge;
- (g) “recharge zone” means the zone which contributes water to an aquifer, consisting of the catchment area of rainfall water and the area where such water flows to an aquifer by runoff on the ground and infiltration through soil;
- (h) “discharge zone” means the zone where water originating from an aquifer flows to its outlets, such as a watercourse, a lake, an oasis, a wetland or an ocean.

PART II

GENERAL PRINCIPLES

Article 3. Sovereignty of aquifer States

Each aquifer State has sovereignty over the portion of a transboundary aquifer or aquifer system located within its territory. It shall exercise its sovereignty in accordance with international law and the present draft articles.

Article 4. Equitable and reasonable utilization

Aquifer States shall utilize transboundary aquifers or aquifer systems according to the principle of equitable and reasonable utilization, as follows:

- (a) they shall utilize transboundary aquifers or aquifer systems in a manner that is consistent with the equitable and reasonable accrual of benefits therefrom to the aquifer States concerned;
- (b) they shall aim at maximizing the long-term benefits derived from the use of water contained therein;

(c) they shall establish individually or jointly a comprehensive utilization plan, taking into account present and future needs of, and alternative water sources for, the aquifer States; and

(d) they shall not utilize a recharging transboundary aquifer or aquifer system at a level that would prevent continuance of its effective functioning.

Article 5. Factors relevant to equitable and reasonable utilization

1. Utilization of a transboundary aquifer or aquifer system in an equitable and reasonable manner within the meaning of draft article 4 requires taking into account all relevant factors, including:

- (a) the population dependent on the aquifer or aquifer system in each aquifer State;
- (b) the social, economic and other needs, present and future, of the aquifer States concerned;
- (c) the natural characteristics of the aquifer or aquifer system;
- (d) the contribution to the formation and recharge of the aquifer or aquifer system;
- (e) the existing and potential utilization of the aquifer or aquifer system;
- (f) the actual and potential effects of the utilization of the aquifer or aquifer system in one aquifer State on other aquifer States concerned;
- (g) the availability of alternatives to a particular existing and planned utilization of the aquifer or aquifer system;
- (h) the development, protection and conservation of the aquifer or aquifer system and the costs of measures to be taken to that effect;
- (i) the role of the aquifer or aquifer system in the related ecosystem.

2. The weight to be given to each factor is to be determined by its importance with regard to a specific transboundary aquifer or aquifer system in comparison with that of other relevant factors. In determining what is equitable and reasonable utilization, all relevant factors are to be considered together and a conclusion reached on the basis of all the factors. However, in weighing different kinds of utilization of a transboundary aquifer or aquifer system, special regard shall be given to vital human needs.

Article 6. Obligation not to cause significant harm

1. Aquifer States shall, in utilizing transboundary aquifers or aquifer systems in their territories, take all appropriate measures to prevent the causing of significant harm to other aquifer States or other States in whose territory a discharge zone is located.

2. Aquifer States shall, in undertaking activities other than utilization of a transboundary aquifer or aquifer system that have, or are likely to have, an impact upon that transboundary aquifer or aquifer system, take all appropriate measures to prevent the causing of significant harm through that aquifer or aquifer system to other aquifer States or other States in whose territory a discharge zone is located.

3. Where significant harm nevertheless is caused to another aquifer State or a State in whose territory a discharge zone is located, the aquifer State whose activities cause such harm shall take, in consultation with the affected State, all appropriate response measures to eliminate or mitigate such harm, having due regard for the provisions of draft articles 4 and 5.

Article 7. General obligation to cooperate

1. Aquifer States shall cooperate on the basis of sovereign equality, territorial integrity, sustainable development, mutual benefit and good faith in order to attain equitable and reasonable utilization and appropriate protection of their transboundary aquifers or aquifer systems.

2. For the purpose of paragraph 1, aquifer States should establish joint mechanisms of cooperation.

Article 8. Regular exchange of data and information

1. Pursuant to draft article 7, aquifer States shall, on a regular basis, exchange readily available data and information on the condition of their transboundary aquifers or aquifer systems, in particular of a geological, hydrogeological, hydrological, meteorological and ecological nature and related to the hydrochemistry of the aquifers or aquifer systems, as well as related forecasts.

2. Where knowledge about the nature and extent of a transboundary aquifer or aquifer system is inadequate, aquifer States concerned shall employ their best efforts to collect and generate more complete data and information relating to such aquifer or aquifer system, taking into account current practices and standards. They shall take such action individually or jointly and, where appropriate, together with or through international organizations.

3. If an aquifer State is requested by another aquifer State to provide data and information relating to an aquifer or aquifer system that are not readily available, it shall employ its best efforts to comply with the request. The requested State may condition its compliance upon payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing such data or information.

4. Aquifer States shall, where appropriate, employ their best efforts to collect and process data and information in a manner that facilitates their utilization by the other aquifer States to which such data and information are communicated.

Article 9. Bilateral and regional agreements and arrangements

For the purpose of managing a particular transboundary aquifer or aquifer system, aquifer States are encouraged to enter into bilateral or regional agreements or arrangements among themselves. Such agreements or arrangements may be entered into with respect to an entire aquifer or aquifer system or any part thereof or a particular project, programme or utilization except insofar as an agreement or arrangement adversely affects, to a significant extent, the utilization, by one or more other aquifer States of the water in that aquifer or aquifer system, without their express consent.

PART III

PROTECTION, PRESERVATION AND MANAGEMENT

Article 10. Protection and preservation of ecosystems

Aquifer States shall take all appropriate measures to protect and preserve ecosystems within, or dependent upon, their transboundary aquifers or aquifer systems, including measures to ensure that the quality and quantity of water retained in an aquifer or aquifer system, as well as that released through its discharge zones, are sufficient to protect and preserve such ecosystems.

Article 11. Recharge and discharge zones

1. Aquifer States shall identify the recharge and discharge zones of transboundary aquifers or aquifer systems that exist within their territory. They shall take appropriate measures to prevent and minimize detrimental impacts on the recharge and discharge processes.

2. All States in whose territory a recharge or discharge zone is located, in whole or in part, and which are not aquifer States with regard to that aquifer or aquifer system, shall cooperate with the aquifer States to protect the aquifer or aquifer system and related ecosystems.

Article 12. Prevention, reduction and control of pollution

Aquifer States shall, individually and, where appropriate, jointly, prevent, reduce and control pollution of their transboundary aquifers or aquifer systems, including through the recharge process, that may cause significant harm to other aquifer States. Aquifer States shall take a precautionary approach in view of uncertainty about the nature and extent of a transboundary aquifer or aquifer system and of its vulnerability to pollution.

Article 13. Monitoring

1. Aquifer States shall monitor their transboundary aquifers or aquifer systems. They shall, wherever possible, carry out these monitoring activities jointly with other aquifer States concerned and, where appropriate, in collaboration with competent international organizations. Where monitoring activities cannot be carried out jointly, the aquifer States shall exchange the monitored data among themselves.

2. Aquifer States shall use agreed or harmonized standards and methodology for monitoring their transboundary aquifers or aquifer systems. They should identify key parameters that they will monitor based on an agreed conceptual model of the aquifers or aquifer systems. These parameters should include parameters on the condition of the aquifer or aquifer system as listed in draft article 8, paragraph 1, and also on the utilization of the aquifers or aquifer systems.

Article 14. Management

Aquifer States shall establish and implement plans for the proper management of their transboundary aquifers or aquifer systems. They shall, at the request of any of them, enter into consultations concerning the management of a transboundary aquifer or aquifer system. A joint management mechanism shall be established, wherever appropriate.

Article 15. Planned activities

1. When a State has reasonable grounds for believing that a particular planned activity in its territory may affect a transboundary aquifer or aquifer system and thereby may have a significant adverse effect upon another State, it shall, as far as practicable, assess the possible effects of such activity.

2. Before a State implements or permits the implementation of planned activities which may affect a transboundary aquifer or aquifer system and thereby may have a significant adverse effect upon another State, it shall provide that State with timely notification thereof. Such notification shall be accompanied by available technical data and information, including any environmental impact assessment, in order to enable the notified State to evaluate the possible effects of the planned activities.

3. If the notifying and the notified States disagree on the possible effect of the planned activities, they shall enter into consultations and, if necessary, negotiations with a view to arriving at an equitable resolution of the situation. They may utilize an independent fact-finding body to make an impartial assessment of the effect of the planned activities.

PART IV

MISCELLANEOUS PROVISIONS

Article 16. Technical cooperation with developing States

States shall, directly or through competent international organizations, promote scientific, educational, legal and other cooperation with developing States for the protection and management of transboundary aquifers or aquifer systems, including, *inter alia*:

- (a) strengthening their capacity-building in scientific, technical and legal fields;
- (b) facilitating their participation in relevant international programmes;
- (c) supplying them with necessary equipment and facilities;
- (d) enhancing their capacity to manufacture such equipment;
- (e) providing advice on and developing facilities for research, monitoring, educational and other programmes;
- (f) providing advice on and developing facilities for minimizing the detrimental effects of major activities affecting their transboundary aquifer or aquifer system;

(g) providing advice in the preparation of environmental impact assessments;

(h) supporting the exchange of technical knowledge and experience among developing States with a view to strengthening cooperation among them in managing the transboundary aquifer or aquifer system.

Article 17. Emergency situations

1. For the purpose of the present draft article, “emergency” means a situation, resulting suddenly from natural causes or from human conduct, that affects a transboundary aquifer or aquifer system and poses an imminent threat of causing serious harm to aquifer States or other States.

2. The State within whose territory the emergency originates shall:

(a) without delay and by the most expeditious means available, notify other potentially affected States and competent international organizations of the emergency;

(b) in cooperation with potentially affected States and, where appropriate, competent international organizations, immediately take all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate any harmful effect of the emergency.

3. Where an emergency poses a threat to vital human needs, aquifer States, notwithstanding draft articles 4 and 6, may take measures that are strictly necessary to meet such needs.

4. States shall provide scientific, technical, logistical and other cooperation to other States experiencing an emergency. Cooperation may include coordination of international emergency actions and communications, making available emergency response personnel, emergency response equipment and supplies, scientific and technical expertise and humanitarian assistance.

Article 18. Protection in time of armed conflict

Transboundary aquifers or aquifer systems and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and non-international armed conflict and shall not be used in violation of those principles and rules.

Article 19. Data and information vital to national defence or security

Nothing in the present draft articles obliges a State to provide data or information vital to its national defence or security. Nevertheless, that State shall cooperate in good faith with other States with a view to providing as much information as possible under the circumstances.

2. TEXT OF THE DRAFT ARTICLES WITH COMMENTARIES THERETO

54. The text of the draft articles with commentaries thereto on the law of transboundary aquifers as adopted on second reading by the Commission at its sixtieth session are reproduced below.

General commentary

(1) The International Law Commission decided, at its fifty-fourth session (2002), on the inclusion in its programme of work of the topic entitled “Shared natural resources”. It was generally understood that this topic included groundwaters, oil and natural gas, although the point was made that the topic could also include such resources as migratory birds and other animals. The Commission decided to adopt a step-by-step approach and to

focus on the consideration of transboundary groundwaters as the follow-up to the Commission’s previous work on the codification of the law of surface waters,²¹ at least during the first reading of the draft articles. The Commission adopted on first reading a set of 19 draft articles on the law of transboundary aquifers and commentaries thereto in 2006 and transmitted them to Governments for comments and observations, as well as on the final form of the draft articles, to be submitted by 1 January 2008. The Commission, in 2007, while awaiting the comments from Governments, addressed the question of relationship between its work on transboundary aquifers and that on oil and natural gas. It indicated its preference to proceed with and complete the second reading of the law of transboundary aquifers independently of its possible future work on oil and natural gas.²²

(2) During the debates on the reports of the Commission in the Sixth Committee of the General Assembly at the sixty-first (2006) and sixty-second (2007) sessions, Governments offered their oral comments.²³ Written comments were also transmitted to the Secretary-General pursuant to the Commission’s request.²⁴ The comments made by Governments on the draft articles adopted on first reading were in general favourable and supportive, and the Commission was encouraged to proceed with the second reading on the basis of the first reading text of the draft articles while certain suggestions were offered for improvements. On the question of the relationship between the work on transboundary aquifers and that on oil and natural gas, the overwhelming majority supported the view that the law on transboundary aquifers should be treated independently of any future work of the Commission on the issues related to oil and natural gas. On the question of the final form of the draft articles, the views of Governments were divergent. Some supported the adoption of a legally binding instrument while some others favoured a non-legally binding instrument.

(3) The Commission, at its sixtieth session (2008), considered various comments from Governments and adopted on second reading revised texts containing a set of 19 draft articles on the law of transboundary aquifers. The adopted second reading texts are presented in the form of draft articles. Consistent with the practice of the Commission, the term “draft articles” has been used without prejudice as to the final form of the product. As the views of Governments on the final form of the draft articles were divided, the Commission decided to recommend to the General Assembly a two-step approach, consisting of the General Assembly: (a) taking note of the draft articles to be annexed to its resolution and recommending that States concerned make appropriate bilateral and regional arrangements for the proper management of their transboundary aquifers on the basis of the principles enunciated in the draft articles; and (b) considering, at a later stage, the elaboration of a convention on the basis of the draft articles. Since

²¹ 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses.

²² See *Yearbook ... 2007*, vol. II (Part Two), pp. 56–60, paras. 160–183.

²³ Topical summaries in documents A/CN.4/577 and Add.1–2 (see footnote 16 above) and A/CN.4/588 (*idem*).

²⁴ A/CN.4/595 and Add.1.

there would be some time before a decision is made on the second step, the Commission decided to refrain from formulating a draft article on the relationship between these draft articles and other international agreements and also a draft article on the settlement of disputes, the formulation of which would become necessary only when the second step would be initiated.

(4) The Commission considered carefully for each draft article the question whether it would be necessary to structure the draft articles in such a way as to have obligations that would apply to all States generally, obligations of aquifer States *vis-à-vis* other aquifer States and obligations of aquifer States *vis-à-vis* non-aquifer States. It was decided that, in order to be effective, some draft articles would have to impose obligations on States that did not share the transboundary aquifers in question and in certain cases give rights to the latter States towards aquifer States. Moreover, in some other instances, the obligations would be generally applicable to all States. In reaching these conclusions, the Commission recognized the need to protect transboundary aquifers.

(5) The draft articles take into account many existing bilateral, regional and international agreements and arrangements on groundwaters. Many such instruments have been compiled in a publication by FAO in association with UNESCO.²⁵ The work on transboundary aquifers by the Commission was facilitated by the valuable contribution and assistance of groundwater scientists (hydrogeologists), groundwater administrators and water law experts. Since 2003, UNESCO, which is the coordinating agency of the United Nations system on global water problems, played a significant role through its International Hydrological Programme (UNESCO-IHP) in providing scientific and technical advice to the Special Rapporteur and the Commission. It mobilized coordinated action with other United Nations agencies, commissions and programmes, such as FAO, UNECE and the United Nations Environment Programme/Global Environmental Facility, as well as the International Atomic Energy Agency. It also collaborated with the International Association of Hydrogeologists, the Organization of American States (OAS), the International Groundwater Resources Assessment Centre, the Franco–Swiss Genevese Aquifer Management Commission and the Guarani Aquifer System Project. To those organizations, the Special Rapporteur and the Commission were sincerely grateful. The Commission also held an informal meeting in 2004 with the Water Resources Law Committee of the International Law Association and wished to acknowledge its comments on the Commission's draft articles adopted on first reading, as well as its appreciation of the International Law Association Berlin Rules of 2004.²⁶

(6) The second reading text of the draft articles on the law of transboundary aquifers adopted by the Commission in 2008 contains several changes from the text adopted on first reading, most of which are explained in the corresponding commentaries.

²⁵ S. Burchi and K. Mechlem, *Groundwater in International Law: Compilation of Treaties and Other Legal Instruments*, Rome, FAO/UNESCO, 2005.

²⁶ International Law Association, *Report of the Seventy-First Conference, Berlin, 16–21 August 2004*, London, 2004, pp. 335–412.

PREAMBLE

...

Conscious of the importance for humankind of life-supporting groundwater resources in all regions of the world,

Bearing in mind Article 13, paragraph 1 (a), of the Charter of the United Nations, which provides that the General Assembly shall initiate studies and make recommendations for the purpose of encouraging the progressive development of international law and its codification,

Recalling General Assembly resolution 1803 (XVII) of 14 December 1962 on permanent sovereignty over natural resources,

Reaffirming the principles and recommendations adopted by the United Nations Conference on Environment and Development of 1992 in the Rio Declaration on Environment and Development and Agenda 21,

Taking into account increasing demands for freshwater and the need to protect groundwater resources,

Mindful of the particular problems posed by the vulnerability of aquifers to pollution,

Convinced of the need to ensure the development, utilization, conservation, management and protection of groundwater resources in the context of the promotion of the optimal and sustainable development of water resources for present and future generations,

Affirming the importance of international cooperation and good neighbourliness in this field,

Emphasizing the need to take into account the special situation of developing countries,

Recognizing the necessity to promote international cooperation,

...

Commentary

(1) The preamble was added on second reading in order to provide a contextual framework for the draft articles. The draft preamble follows previous precedents elaborated by the Commission, in particular on the draft articles on prevention of transboundary harm from hazardous activities²⁷ and the draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities.²⁸

(2) The first preambular paragraph is overarching in recognizing the importance of groundwater as a life-supporting resource for humankind. Fresh water is indispensable for the survival of humankind. Humankind depends

²⁷ *Yearbook ... 2001*, vol. II (Part Two) and corrigendum, pp. 146–148, para. 97.

²⁸ *Yearbook ... 2006*, vol. II (Part Two), pp. 58–59, para. 66.

on it for drinking and sanitation (washing and cleaning), for agricultural production and for raising livestock. There exists no substitute natural resource. Ninety-seven per cent of readily available freshwater is stored underground.²⁹ Due to rapid population growth and accelerated economic development, groundwater resources are being overextracted and polluted. There exists an urgent need to introduce proper management of groundwater resources.

(3) The third preambular paragraph recalls General Assembly resolution 1803 (XVII) on permanent sovereignty over natural resources. The fourth preambular paragraph reaffirms the 1992 Rio Declaration on the Environment and Development (“Rio Declaration”)³⁰ and Agenda 21 of the United Nations Conference on Environment and Development, chapter 18 of which espouses the application of integrated approaches to the development, management and use of water resources.³¹

(4) The fifth, sixth and seventh preambular paragraphs state the main purposes of the present draft articles, mainly utilization and protection of groundwater resources, bearing in mind the increasing demands for freshwater (and thus the need to protect groundwater resources), the particular problems posed by the vulnerability of the aquifers, and the needs of present and future generations. The eighth, ninth and tenth preambular paragraphs accord particular emphasis on international cooperation and, bearing in mind the principles of common but differentiated responsibilities, take into account the special situation of developing countries.

PART I

INTRODUCTION

Article 1. Scope

The present draft articles apply to:

(a) utilization of transboundary aquifers or aquifer systems;

(b) other activities that have or are likely to have an impact upon such aquifers or aquifer systems; and

(c) measures for the protection, preservation and management of such aquifers or aquifer systems.

Commentary

(1) Draft article 1 defines the scope to which the present draft articles apply. While it is generally appropriate to denote a body of underground waters as “groundwaters”, for the purposes of the present draft articles the technical term “aquifer” is opted for, as the term defined

in draft article 2 is more scientifically precise and leaves no ambiguity for both lawyers and groundwater scientists and administrators. An aquifer is often hydraulically connected to one or more aquifers. In such a case, these aquifers must be treated as a single system for proper management as there is hydraulic consistency between them. This series of two or more aquifers is termed an “aquifer system”. In the draft articles, aquifers and aquifer systems are always referred to jointly.

(2) The mandate given to the Commission was to codify the law on “shared natural resources”. Accordingly, the present draft articles apply only to “transboundary” aquifers or aquifer systems. All the transboundary aquifers and aquifer systems will be governed by the present draft articles, regardless of whether they are hydraulically connected to international watercourses. Though groundwaters covered by the 1997 Watercourses Convention in accordance with its article 2 (a) possess more characteristics of surface waters, in that the Convention covers a system of surface waters and groundwaters constituting “by virtue of their physical relationship a unitary whole and normally flowing into a common terminus”, the possibility that such groundwaters are also governed by the present draft articles could not be completely disregarded. Accordingly, when the present draft articles were to become a legally binding instrument, the need would arise to determine the relationship between the present draft articles and the 1997 Watercourses Convention.

(3) Draft article 1 addresses three different categories of activities, in subparagraphs (a) to (c), which are to be covered by the draft articles. Subparagraph (a) deals with utilization of aquifers that has most direct impact on aquifers. The term “utilization” was opted for instead of “uses”, as “utilization” includes also the mode of uses. “Utilization” is defined in draft article 2.

(4) Subparagraph (b) deals with activities other than utilization that have or are likely to have an impact upon aquifers. The subparagraph may, at first sight, seem overly broad and could be interpreted as imposing unnecessary limitations on such activities. However, in the case of aquifers, it is absolutely necessary to regulate such activities in order to properly manage an aquifer or aquifer system. The obligation with respect to those activities is precisely spelled out in the substantive draft articles. Such activities are those that are carried out just above or close to an aquifer or aquifer system and cause or may cause some adverse effects on it. There must, of course, be a causal link between the activities and the effects. For example, the careless use of chemical fertilizer or pesticides in farming on the ground above an aquifer or aquifer system may pollute waters in the aquifer or aquifer system. The construction of a subway without appropriate surveys may destroy a geological formation of an aquifer or aquifer system or impair its recharge or discharge process. The impact upon aquifers would include deterioration of water quality, reduction of water quantity and adverse change in the functioning of the aquifers. In and of itself, the term “impact” does not relate to either a positive or a negative effect. However, the term may be understood to have a negative connotation if the context in which it is used is negative as in the case of subparagraph (b). “Impact” is broader than the concept of “harm”

²⁹ See Burchi and Mechlem, *op. cit.* (footnote 25 above), foreword. See also P.H. Gleick, “Water resources”, in S. H. Schneider (ed.), *Encyclopedia of Climate Change and Weather*, vol. 2, New York, Oxford University Press, 1996, pp. 817–823.

³⁰ *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992* (United Nations publication, Sales No. E.93.I.8 and corrigendum), vol. I: *Resolutions adopted by the Conference*, resolution 1, Annex I.

³¹ *Ibid.*, Annex II, paras. 18.1–18.90.

or “damage”, which is more specific. The determination of the threshold of the impact is left to later substantive draft articles.

(5) In subparagraph (c), “measures” are meant to embrace not only those to be taken to deal with degradation of aquifers, but also with their improvements and the various forms of cooperation, whether or not institutionalized.

Article 2. Use of terms

For the purpose of the present draft articles:

(a) “aquifer” means a permeable water-bearing geological formation underlain by a less permeable layer and the water contained in the saturated zone of the formation;

(b) “aquifer system” means a series of two or more aquifers that are hydraulically connected;

(c) “transboundary aquifer” or “transboundary aquifer system” means, respectively, an aquifer or aquifer system, parts of which are situated in different States;

(d) “aquifer State” means a State in whose territory any part of a transboundary aquifer or aquifer system is situated;

(e) “utilization of transboundary aquifers or aquifer systems” includes extraction of water, heat and minerals, and storage and disposal of any substance;

(f) “recharging aquifer” means an aquifer that receives a non-negligible amount of contemporary water recharge;

(g) “recharge zone” means the zone which contributes water to an aquifer, consisting of the catchment area of rainfall water and the area where such water flows to an aquifer by runoff on the ground and infiltration through soil;

(h) “discharge zone” means the zone where water originating from an aquifer flows to its outlets, such as a watercourse, a lake, an oasis, a wetland or an ocean.

Commentary

(1) Draft article 2 defines eight terms that have been employed in the present draft articles. The technical terms have been used to make the text friendly to its intended users, namely scientific personnel and water management administrators. There are various definitions of aquifer and groundwaters in existing treaties and other international legal documents.³² However, for the purposes of the present draft articles, the definition of an aquifer in

subparagraph (a) offers the precise description of the two elements of which an aquifer consists and the activities relating to which they must be regulated. One element is the underground geological formation which functions as a container for water. The other element is the water stored therein which is extractable. The term “water-bearing” is used in order to leave no doubt that the coverage of the present draft articles does not extend to oil and natural gas. The reference to “underground” in the first reading text has been deleted, as it is self-evident that aquifers are a subsurface geological formation. A “geological formation” consists of naturally occurring materials such as rock, gravel and sand. All the aquifers are underlain by less permeable layers which serve, as it were, as the bottom of the container. Some aquifers are also upper-lain by less permeable layers. The waters stored in such aquifers are referred to as confined groundwaters as they are pressurized by more than atmospheric pressure.

(2) The definition of the “water” in an aquifer is limited to that stored in the saturated zone of the geological formation, as only such water is easily extractable. The water located above the saturated zone of the geological formation is, like the water located underground outside an aquifer, kept in pores and in the form of vapour and cannot be easily extracted. It is like shale oil. It is of course theoretically possible to separate such waters from air and soil, but it is not technically nor economically possible to do so at present. The question was raised whether the draft articles should also apply to the formations containing only minimal amounts of water. While it is obvious

quantities of groundwater.” (*Official Journal of the European Communities*, No. L 327 of 22 December 2000, p. 6).

The United Nations Compensation Commission, Report and recommendations made by the Panel of Commissioners concerning the Third Instrument of “F4” Claims:

“Aquifer: Natural water-bearing geological formation found below the surface of the earth” (S/AC.26/2003/31, Glossary).

Article 1, paragraph 1, of the Bellagio Model Agreement Concerning the Use of Transboundary Groundwaters of 1989:

“‘Aquifer’ means a subsurface waterbearing geologic formation from which significant quantities of water may be extracted.” (Burchi and Mechlem, *op. cit.* (footnote 25 above), p. 537).

Article 3, paragraph 2, of the International Law Association Berlin Rules on Water Resources, 2004:

“‘Aquifer’ means a subsurface layer or layers of geological strata of sufficient porosity and permeability to allow either a flow of or the withdrawal of usable quantities of groundwater” (*Report of the Seventy-First Conference* (see footnote 26 above), p. 9).

Article 1, paragraph 2 (a), of Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances (*Official Journal of the European Communities*, No. L 020 of 26 January 1980, p. 43); article 2 (a) of Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (*ibid.*, No. L 375 of 31 December 1991, p. 6); article 2, paragraph 3 of the Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes; and article 2, paragraph 2, of Directive 2000/60/EC of the European Parliament and of the Council of 23 October establishing a framework for Community action in the field of water policy:

“‘Groundwater’ means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.”

Article 3, paragraph 11 of the International Law Association Berlin Rules on Water Resources, 2004:

“‘Groundwater’ means water beneath the surface of the ground located in a saturated zone and in direct contact with the ground or soil.”

³² Article 2, paragraph 11 of Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy:

“‘Aquifer’ means a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant

that States are not concerned with an aquifer that has no significance to them, it would not be possible to define an absolute criterion for that. The water that is dealt with by the draft articles is essentially fresh water, a life support resource of humankind. The freshness of the water is implied in the definition and experts would use the WHO Guidelines for Drinking-water Quality. Geological formations containing such fresh water are only found below the surface of the land. Submarine geological formations under the continental shelf do not hold fresh water and accordingly such formations and water therein fall outside the scope of the present draft articles. However, some aquifers hold brackish water, and coastal aquifers that discharge into the sea interface with salt water. Brackish and low-salinity water in such aquifers could be used for irrigation or could be desalinated. The present draft articles apply also to such aquifers.

(3) An “aquifer system” consists of two or more aquifers that are hydraulically connected to each other. Such aquifers are not only of the same geological formation but could also be of different geological formations. Aquifers could be hydraulically connected vertically or horizontally as well. “Hydraulically connected” refers to a physical relationship between two or more aquifers whereby an aquifer is capable of transmitting some quantity of water to the other aquifers and *vice versa*. The quantity of water that is capable of being transmitted is important since an insignificant or *de minimis* quantity of water may not translate into a true hydraulic connection. The standard for determining whether a quantity is significant is directly related to the potential of the transmitting aquifer to have an effect on the quantity and quality of waters in the receiving aquifers. It would not be possible to formulate general and absolute criteria for such an effect. A judgement has to be made in each specific case on whether those aquifers should be treated as a system for the proper management of the aquifers.

(4) Subparagraph (c) defines the terms “transboundary aquifer” and “transboundary aquifer system”, which are used in draft article 1 on scope and in many other draft articles. The focus in this paragraph is on the adjective “transboundary”. The paragraph provides that, in order to be regarded as a “transboundary” aquifer or aquifer system, parts of the aquifer or aquifer system in question must be situated in different States. Whether parts of an aquifer or aquifer system are situated in different States depends on physical factors. In the case of surface waters, the existence of such factors can be easily established by simple observation. In the case of groundwaters, the determination of the existence of transboundary aquifers requires more sophisticated methods, relying on drilling and technology such as isotope tracing to define the outer limit of the aquifers.

(5) Subparagraph (d) defines the term “aquifer State”, which is used throughout the draft articles. When the existence of a part of a transboundary aquifer or aquifer system is established in the territory of a particular State, that State is an aquifer State for the purposes of the draft articles. Territory includes the territorial waters. In some exceptional cases, a third State may administer the territory of another State where a part of a transboundary aquifer or aquifer system is located. Whether an

administering State should be deemed as an aquifer State must be decided case by case, taking into account the benefit of the population utilizing such aquifer.

(6) Subparagraph (e) was formulated on second reading. Extraction of fresh water is of course the main utilization of aquifers. Other kinds of utilization, however exceptional and peripheral, should not be ignored. “Utilization” is defined in a non-exhaustive manner to include not only extraction of water, but also extraction of heat for thermo-energy and extraction of minerals that may be found in aquifers, as well as storage or disposal of waste, such as a new experimental technique to utilize an aquifer for carbon dioxide sequestration. It is anticipated that rules on disposal of toxic, radioactive and other hazardous waste will also be applicable.

(7) An aquifer may be recharging or non-recharging. Somewhat different rules apply to each of them. Subparagraph (f) defines a recharging aquifer. For the purposes of management of aquifers, a “non-recharging” aquifer is one that receives “negligible” water recharge “contemporarily”. The term “non-negligible” refers to the recharge of some quantity of waters. Whether such quantity is “non-negligible” should be assessed with reference to the specific characteristics of the receiving aquifer, including the volume of water in the receiving aquifer, the volume of water discharged from it, the volume of water that recharges it and the rate at which the recharge occurs. The term “contemporarily” should be understood for convenience as the timespan of approximately 100 years, 50 years in the past and 50 years in the future. Scientists generally classify those aquifers located in an arid zone where an annual rainfall is less than 200 mm as non-recharging aquifers. It is possible to ascertain whether a particular aquifer has been receiving water recharge during the period of approximately the last 50 years by using radioactive tracers. These tracers are cesium and tritium from nuclear weapons tests with a peak of injection at 1963/1964, and krypton from the continuous emission of the nuclear industry from mid-1950s. They have been floating in the atmosphere for the last 50 years and can be detected in the aquifer that receives recharge from rainfall during that period.

(8) Each aquifer may have a “recharge zone”, including a catchment area that is hydraulically connected to an aquifer and a “discharge zone”, through which water from an aquifer flows to its outlet. The definitions of “recharge zone” and “discharge zone” are given in subparagraphs (g) and (h). These zones are outside the aquifer although they are hydraulically connected to it. A recharge zone contributes water to an aquifer and includes the zone where the rainfall water directly infiltrates the ground, the zone of surface run-off which eventually infiltrates the ground and the underground unsaturated zone of infiltration. The discharge zone is the area through which water from the aquifer flows to its outlet, which may be a river, a lake, an ocean, an oasis or a wetland. Such outlets are not part of the discharge zone itself. The aquifer and its recharge and discharge zones form a dynamic continuum in the hydrological cycle. The recognition of the need to protect those zones points to the importance of the protection of the overall environment on which the life of an aquifer depends. Those zones are subject to particular measures and cooperative arrangements under the provisions of the present draft articles.

PART II

GENERAL PRINCIPLES

Article 3. Sovereignty of aquifer States

Each aquifer State has sovereignty over the portion of a transboundary aquifer or aquifer system located within its territory. It shall exercise its sovereignty in accordance with international law and the present draft articles.

Commentary

(1) The need to have an explicit reference in the form of a draft article to the sovereignty of States over the natural resources within their territories was reaffirmed by many States, particularly by those aquifer States that are of the opinion that water resources belong to the States in which they are located and are subject to the exclusive sovereignty of those States. It was also pointed out that groundwaters must be regarded as belonging to the States where they are located, along the lines of oil and natural gas. Reference was made, in that regard, to General Assembly resolution 1803 (XVII) of 14 December 1962, entitled “Permanent sovereignty over natural resources”. The reference to that resolution has been made in the preamble.

(2) Many treaties and other legal instruments refer to sovereignty of States over natural resources.³³ Draft article 3 reiterates the basic principle that States have sovereignty

³³ (a) Treaties referring to the concept within their preambles: the Vienna Convention for the Protection of the Ozone Layer (1985); the 1991 Agreement on air quality between Canada and the United States (United Nations, *Treaty Series*, vol. 1852, No. 31532, p. 79, reproduced in ILM, vol. 30 (1991), p. 678); the United Nations Framework Convention on Climate Change (1992); the Convention on Biological Diversity (1992); the Convention to combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa (1994); and the Convention on the sustainable management of Lake Tanganyika (2003);

(b) Treaties referring to the concept within their provisions: the Vienna Convention on succession of States in respect of treaties (1978); the African Charter on Human and Peoples’ Rights (1981); the United Nations Convention on the Law of the Sea (1982); the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (1986); the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995); the Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1999); and the African Convention on the Conservation of Nature and Natural Resources (2003);

(c) Non-binding international instruments referring to the concept: the draft articles on prevention of transboundary harm from hazardous activities, adopted by the Commission at its fifty-third session, in 2001 (see footnote 27 above); “Concerted action for economic development of economically less developed countries” (General Assembly resolution 1515 (XV) of 15 December 1960); “Permanent sovereignty over natural resources” (General Assembly resolution 1803 (XVII) of 14 December 1962); the Declaration of the United Nations Conference on the Human Environment (“Stockholm Declaration”) (1972) (*Report of the United Nations Conference on the Human Environment, Stockholm, 5–16 June 1972* (United Nations publication, Sales No. E.73.II.A.14), part one, chap. I); the Charter of Economic Rights and Duties of States (General Assembly resolution 3281 (XXIX) of 12 December 1974); the Declaration on the Right to Development (General Assembly resolution 41/128 of 4 December 1986); and the Rio Declaration (1992) (see footnote 30 above);

(d) Other related treaties: the ASEAN Agreement on the Conservation of Nature and Natural Resources (1985, not in force).

over an aquifer, or portions of an aquifer, located within their territory. There are basically two types of formulation in State practice with regard to this issue. One type is positive formulation. Some have limiting conditions to the exercise of this sovereign right. An example is:

States have, in accordance with the Charter of the United Nations and the principles of international law, a sovereign right to exploit their own resources pursuant to their environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of their national jurisdiction.³⁴

The other type is the saving or disclaimer clause such as: “Nothing in this Convention shall affect the sovereign right of States to exploit, develop and manage their own natural resources.”³⁵

(3) Draft article 3 adopts the positive type and represents an appropriately balanced text. The two sentences in the draft article are necessary in order to maintain such a balance. In essence, each aquifer State has sovereignty over the transboundary aquifer or aquifer system to the extent located within its territory. The reference to “international law” has been added to indicate that, although the present draft articles have been elaborated against the background of the continued application of customary international law, there are other rules of general international law that remain applicable.

(4) The term “sovereignty” here is a reference to sovereignty over an aquifer located within the territory of an aquifer State, including the territorial sea, and is to be distinguished from the “exercise of sovereign rights”, such as those exercisable over the continental shelf or in the exclusive economic zone adjacent to the territorial sea. As noted earlier in paragraph (2) of the commentary to draft article 2, aquifers in the continental shelf are excluded from the scope of the present articles.

Article 4. Equitable and reasonable utilization

Aquifer States shall utilize transboundary aquifers or aquifer systems according to the principle of equitable and reasonable utilization, as follows:

(a) they shall utilize transboundary aquifers or aquifer systems in a manner that is consistent with the equitable and reasonable accrual of benefits therefrom to the aquifer States concerned;

(b) they shall aim at maximizing the long-term benefits derived from the use of water contained therein;

(c) they shall establish individually or jointly a comprehensive utilization plan, taking into account present and future needs of, and alternative water sources for, the aquifer States; and

[Treaties referring to the concept of peoples’ right over natural resources.]

The International Covenant on Economic, Social and Cultural Rights (1966); the International Covenant on Civil and Political Rights (1966); and the African Charter on Human and Peoples’ Rights (1981).

³⁴ African Convention on the Conservation of Nature and Natural Resources (2003), preamble.

³⁵ Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (1986), art. 4, para. 6.

(d) they shall not utilize a recharging transboundary aquifer or aquifer system at a level that would prevent continuance of its effective functioning.

Commentary

(1) Transboundary aquifers are shared natural resources. Utilization of the aquifer can be divided into two categories, as the aquifer consists of the geological formation and the waters contained in it. The use of its water is most common and the water is mainly used for drinking and other human life support, such as sanitation, irrigation and industry. The utilization of the geological formation is rather rare. A typical example is the artificial recharge being undertaken in the Franco–Swiss Genevise Aquifer System where the water from the River Arve is used for such recharge. The functioning of the aquifer treats the waters with less cost than building a water treatment installation and also produces high quality water. As noted previously, an aquifer may also be used for disposal, in particular through a new experimental technique to utilize aquifers for carbon dioxide sequestration.³⁶ This use is peripheral to the present draft articles.

(2) Draft articles 4 and 5 are closely related. One lays down the general principle of the utilization of aquifers and the other sets out the factors of implementation of the principle. Draft article 4 in its *chapeau* establishes the basic principle applicable to the utilization of shared natural resources of “equitable and reasonable utilization”. This principle is further elaborated in subparagraphs (a) to (d). While the concept of equitable utilization and that of reasonable utilization are different, they are closely interrelated and often combined in various legal regimes.³⁷

(3) Subparagraph (a) explains that equitable and reasonable utilization of aquifers should result in equitable allocation of benefits among the States sharing the aquifer. It is understood that “equitable” is not coterminous with “equal”.

(4) Subparagraphs (b) to (d) are more related to reasonable utilization. In various legal regimes concerning renewable natural resources, “reasonable utilization” is often defined as “sustainable utilization” or “optimum utilization”. There is a well-established scientific definition of this doctrine. It is to take measures on the best scientific evidence available to maintain at, or to restore to, the level of the resources which produces the maximum sustainable yield.³⁸ It requires measures to keep resources in perpetuity. The 1997 Watercourses Convention dealt with renewable waters that receive substantial recharge and, in that context, the principle of sustainable utilization fully applied. In the case of aquifers, the situation is entirely different. The waters in aquifers, whether recharging or non-recharging, are more or less non-renewable, unless they are in artificially recharging aquifers. Thus, the aim is to “maximize the

long-term benefits from the use of such waters”. Such maximization could be realized through the establishment of a comprehensive utilization plan by the aquifer States concerned, taking into account present and future needs, as well as alternative water resources available to them. Subparagraphs (b) and (c) reflect these requirements. In order to acknowledge the concerns of sustainability and intergenerational equity, paragraph 7 of the preamble alludes to these matters. In subparagraph (c), the phrase “individually or jointly” is included to signify the importance of having a prior plan, but it is not necessary that such a plan be a joint endeavour, at least in the initial stage, by the aquifer States concerned. A “comprehensive utilization plan” is only for a particular transboundary aquifer, not the whole water resources of the aquifer States concerned. Accordingly, alternative water resources available should be taken into account.

(5) For a recharging aquifer, it is desirable to plan a much longer period of utilization than in the case of a non-recharging aquifer. However, it is not necessary to limit the level of utilization to the level of recharge. Subparagraph (d) concerns recharging aquifers, including the ones that receive an artificial recharge. It is crucial that they maintain certain physical qualities and characteristics. Accordingly, the paragraph provides that the utilization level should not be such as to prevent continuance of the effective functioning of such aquifers.

(6) Paragraph 2 of the comparable article 5 of the 1997 Watercourses Convention provides another principle for equitable and reasonable participation³⁹ by watercourse States, which includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof. It is not included here as it serves as an underlying basis for the provisions concerning international cooperation to be formulated in later draft articles.⁴⁰

Article 5. Factors relevant to equitable and reasonable utilization

1. Utilization of a transboundary aquifer or aquifer system in an equitable and reasonable manner within the meaning of draft article 4 requires taking into account all relevant factors, including:

(a) the population dependent on the aquifer or aquifer system in each aquifer State;

(b) the social, economic and other needs, present and future, of the aquifer States concerned;

(c) the natural characteristics of the aquifer or aquifer system;

(d) the contribution to the formation and recharge of the aquifer or aquifer system;

(e) the existing and potential utilization of the aquifer or aquifer system;

³⁶ See paragraph (6) of commentary to draft article 2 above.

³⁷ See, for example, article 5, paragraph 1, of the 1997 Watercourses Convention.

³⁸ See article 119 of the United Nations Convention on the Law of the Sea.

³⁹ See paragraphs (5) and (6) of the commentary to article 5 of the draft articles on the law of the non-navigational uses of international watercourses, adopted by the Commission at its forty-sixth session, *Yearbook ... 1994*, vol. II (Part Two), p. 97.

⁴⁰ Draft arts. 7–16.

(f) the actual and potential effects of the utilization of the aquifer or aquifer system in one aquifer State on other aquifer States concerned;

(g) the availability of alternatives to a particular existing and planned utilization of the aquifer or aquifer system;

(h) the development, protection and conservation of the aquifer or aquifer system and the costs of measures to be taken to that effect;

(i) the role of the aquifer or aquifer system in the related ecosystem.

2. The weight to be given to each factor is to be determined by its importance with regard to a specific transboundary aquifer or aquifer system in comparison with that of other relevant factors. In determining what is equitable and reasonable utilization, all relevant factors are to be considered together and a conclusion reached on the basis of all the factors. However, in weighing different kinds of utilization of a transboundary aquifer or aquifer system, special regard shall be given to vital human needs.

Commentary

(1) Draft article 5 lists the factors to be taken into account in determining equitable and reasonable utilization as provided for in draft article 4. It is not easy to arrange the factors so as to separate those that apply to "equitable utilization" from those that apply to "reasonable utilization". In some instances, the factors apply to both. The subparagraphs have nevertheless been arranged to achieve an internal coherence and logic without establishing any order of priority, except to the extent provided for in paragraph 2 of the present draft article. "Factors" include "circumstances". The rules of equitable and reasonable utilization are necessarily general and flexible and require, for their proper application, that aquifer States take into account concrete factors and circumstances of the resources as well as of the need of the aquifer States concerned. What is an equitable and reasonable utilization in a specific case will depend on a weighing of all relevant factors and circumstances. This draft article is almost a reproduction of article 6 of the 1997 Watercourses Convention.

(2) In subparagraph (c), "natural characteristics" is used instead of listing factors of a natural character as referred in the 1997 Watercourses Convention. The reason for this is that factors of a natural character should be taken into account, not one by one, but as characteristics relevant to aquifers. Natural characteristics refer to the physical characteristics that define and distinguish a particular aquifer. If a system approach is followed, one can separate the natural characteristics into three categories: input variables, output variables and system variables. Input variables are related to groundwater recharge from precipitation, rivers and lakes. Output variables are related to groundwater discharge to springs and rivers. System variables relate to aquifer conductivity (permeability) and storability, which describe the state of the system. They are groundwater-level distribution and water characteristics such as

temperature, hardness, pH (acidity and alkalinity), electro-conductivity and total dissolved solids. Together, the three categories of variables describe aquifer characteristics in terms of quantity, quality and dynamics. In effect, these characteristics are identical to those identified in paragraph 1 of draft article 8, on regular exchange of data and information.

(3) Subparagraph (g) relates to whether there are available alternatives to a particular planned or existing utilization of an aquifer. In practice, an alternative would take the form of another source of water supply and the overriding factors would be comparable feasibility, practicability and cost-effectiveness in comparison with the planned or existing utilization of the aquifer. For each of the alternatives, a cost/benefit analysis needs to be performed. Beside feasibility and sustainability, the viability of alternatives plays an important role in the analysis. For example, a sustainable alternative could be considered preferable in terms of aquifer recharge and discharge ratio, but less viable than a controlled depletion alternative.

(4) Subparagraphs (d) and (i) are factors additional to those listed in the 1997 Watercourses Convention. The contribution to the formation and recharge of the aquifer or aquifer system in subparagraph (d) means the comparative size of the aquifer in each aquifer State and the comparative importance of the recharge process in each State where the recharge zone is located. Subparagraph (i) may not seem to fall perfectly into the category of factors. The "role" signifies the variety of purposive functions that an aquifer has in a related ecosystem. This may be a relevant consideration, in particular in an arid region. There exist different meanings attached to the term "ecosystem" within the scientific community. The term "related ecosystem" must be considered in conjunction with "ecosystems" in draft article 10. It refers to an ecosystem that is dependent on aquifers or on groundwaters stored in aquifers. Such an ecosystem may exist within aquifers, such as in karst aquifers, and be dependent on the functioning of aquifers for its own survival. A related ecosystem may also exist outside aquifers and be dependent on aquifers for a certain volume or quality of groundwaters for its existence. For instance, in some lakes, an ecosystem is dependent on aquifers. Lakes may have a complex groundwater flow system associated with them. Some lakes receive groundwater inflow throughout their entire bed. Some have seepage loss to aquifers throughout their entire bed. Others receive groundwater inflow through part of their bed and have seepage loss to aquifers through other parts. The lowering of lake water levels as a result of groundwater pumping can affect the ecosystems supported by the lake. The reduction of groundwater discharge to the lake significantly affects the input of dissolved chemicals to the lake, even in cases where such discharge is a small component of the water budget of the lake, and may result in altering key constituents of the lake, such as nutrients and dissolved oxygen.

(5) Paragraph 2 clarifies that, in determining what is equitable and reasonable utilization, all relevant factors are to be considered together and a conclusion must be reached on the basis of all of them. It remains a valid consideration that the weight to be accorded to individual factors, as well as their relevance, will vary with the

circumstances. However, in weighing different kinds of utilization, special regard shall be given to vital human needs. It should be recalled that, during the elaboration of the 1997 Watercourses Convention, the Working Group of the Whole took note of the following statement of understanding pertaining to “vital human needs”: “In determining ‘vital human needs’, special attention is to be paid to providing sufficient water to sustain human life, including both drinking water and water required for production of food in order to prevent starvation.”⁴¹

Article 6. Obligation not to cause significant harm

1. Aquifer States shall, in utilizing transboundary aquifers or aquifer systems in their territories, take all appropriate measures to prevent the causing of significant harm to other aquifer States or other States in whose territory a discharge zone is located.

2. Aquifer States shall, in undertaking activities other than utilization of a transboundary aquifer or aquifer system that have, or are likely to have, an impact on that transboundary aquifer or aquifer system, take all appropriate measures to prevent the causing of significant harm through that aquifer or aquifer system to other aquifer States or other States in whose territory a discharge zone is located.

3. Where significant harm nevertheless is caused to another aquifer State or a State in whose territory a discharge zone is located, the aquifer States whose activities cause such harm shall take, in consultation with the affected State, all appropriate response measures to eliminate or mitigate such harm, having due regard for the provisions of draft articles 4 and 5.

Commentary

(1) Further to draft article 4, draft article 6 deals with another basic principle for aquifer States. It addresses questions of significant harm arising from utilization and activities other than utilization, both as contemplated in draft article 1 as well as questions of elimination and mitigation of significant harm occurring despite due diligence efforts to prevent such harm. These aspects are respectively addressed in paragraphs 1, 2 and 3. Other than aquifer States, the State in whose territory a discharge zone of the transboundary aquifer is located may also be most likely to be affected by the circumstances envisaged in the draft article. Accordingly, the draft article has been extended to cover such other State.

(2) *Sic utere tuo ut alienum non laedas* (use your own property so as not to injure that of another) is the established principle of international liability. The obligation contained in this draft article is that of “to take all appropriate measures”. In the case of paragraph 1, it is implicit that the harm is caused to other States through transboundary aquifers. In the case of paragraph 2, it is expressly made clear that the draft article applies only to the harm that is caused to other States “through that aquifer or aquifer system”.

⁴¹ Report of the Sixth Committee convening as the Working Group of the Whole, document A/51/869 of 11 April 1997, para. 8.

(3) On the question of the threshold of “significant” harm, in its previous work, the Commission has understood “significant” as meaning something that is more than “detectable” but need not be at the level of “serious” or “substantial”.⁴² The threshold of “significant harm” is a flexible and relative concept. Factual considerations, rather than a legal determination, have to be taken into account in each specific case, in this case also bearing in mind the fragility of aquifers.

(4) Paragraph 3 deals with the eventuality of significant harm even if all appropriate measures are taken by the aquifer States. The reference to “activities” in the paragraph covers both “utilization” and “other activities” in paragraphs 1 and 2, as envisaged in draft article 1. That eventuality is possible because such activities have a risk of causing harm and such risk may not be eliminated. Appropriate response measures to be taken by the aquifer States also include measures of restoration.

(5) Draft article 6 is silent on the question of compensation in circumstances where significant harm resulted despite efforts to prevent such harm. It is understood that the issue of compensation is an area that will be governed by other rules of international law, such as those relating to State responsibility or to international liability for acts not prohibited by international law, and does not require specialized treatment in the present draft articles.

Article 7. General obligation to cooperate

1. Aquifer States shall cooperate on the basis of sovereign equality, territorial integrity, sustainable development, mutual benefit and good faith in order to attain equitable and reasonable utilization and appropriate protection of their transboundary aquifers or aquifer systems.

2. For the purpose of paragraph 1, aquifer States should establish joint mechanisms of cooperation.

Commentary

(1) Draft article 7 sets out the principle of a general obligation of the aquifer States to cooperate with each other and contemplates procedures for such cooperation. Cooperation among aquifer States is a prerequisite for shared natural resources, and the draft article serves to provide a background context for the application of the provisions on specific forms of cooperation, such as regular exchange of data and information, as well as protection, preservation and management. The importance of the obligation to cooperate is indicated in Principle 24 of the Stockholm Declaration.⁴³ The importance of such an obligation for the present subject is confirmed by the United Nations Water

⁴² See, for example, commentaries to the draft articles on the law of the non-navigational uses of international watercourses, *Yearbook ... 1994*, vol. II (Part Two), para. 222; commentaries to the draft articles on prevention of transboundary harm from hazardous activities, *Yearbook ... 2001*, vol. II (Part Two) and corrigendum, para. 98; and commentaries to the draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities, *Yearbook ... 2006*, vol. II (Part Two), para. 67.

⁴³ See footnote 33 above.

Conference in the Mar del Plata Action Plan in 1977⁴⁴ and Chapter 18 of Agenda 21 on the Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources, of the 1992 United Nations Conference on Environment and Development.⁴⁵ A wide variety of international instruments on surface waters and groundwater issues call for cooperation between the parties with regard to the protection, preservation and management of transboundary aquifers.⁴⁶

(2) Paragraph 1 provides for the basis and objectives of cooperation and reproduces in substance the text of article 8 of the 1997 Watercourses Convention. The principles of “sovereign equality” and “territorial integrity” are underlined as the basis for cooperation. The principle of “sustainable development” has been included as a general principle that ought to be taken into account as well. The term “sustainable development” denotes the general principle of sustainable development and should be distinguished from the concept of “sustainable utilization”.⁴⁷

(3) Paragraph 2 envisages the establishment of “joint mechanisms for cooperation” which refers to a mutually agreeable means of decision-making among aquifer States. It does not exclude the possibility of using existing mechanisms. In practical terms, such joint mechanisms include a commission, an authority or other institution established by the aquifer States concerned to achieve a specified purpose. The types of cooperation may include exchange of information and databases, ensuring the compatibility of such databases, coordinated communication, monitoring, early warning and alarm system, management as well as research and development. The competence of such a body would be for the aquifer States concerned to determine. Such a mechanism is also useful in averting disputes among aquifer States.

(4) Europe has a long tradition of international river commissions such as the International Commission for the Protection of the Rhine, the Maas Commission and the Danube Commission. Within these commissions or in close cooperation with them, bilateral cross-border commissions such as the Permanent Dutch–German Cross-border Water Commission operate. The existing commissions deal primarily with surface water

issues. The European Union water framework Directive 2000/60/EC⁴⁸ is implemented mainly through commissions for delineation and monitoring. These commissions will increasingly become responsible for transboundary aquifer management as well.⁴⁹ In other parts of the world, it is also expected that comparable regional organizations will play a role in promoting the establishment of similar joint mechanisms.⁵⁰ It is also noted that such joint mechanisms could be established by local administrations on both sides of the border, such as the Franco–Swiss Genevese Aquifer Management Commission established by the Canton of Geneva and the Prefecture of Haute-Savoie (1996).

Article 8. Regular exchange of data and information

1. Pursuant to draft article 7, aquifer States shall, on a regular basis, exchange readily available data and information on the condition of their transboundary aquifers or aquifer systems, in particular of a geological, hydrogeological, hydrological, meteorological and ecological nature and related to the hydrochemistry of the aquifers or aquifer systems, as well as related forecasts.

2. Where knowledge about the nature and extent of a transboundary aquifer or aquifer system is inadequate, aquifer States concerned shall employ their best efforts to collect and generate more complete data and information relating to such aquifer or aquifer system, taking into account current practices and standards. They shall take such action individually or jointly and, where appropriate, together with or through international organizations.

3. If an aquifer State is requested by another aquifer State to provide data and information relating to an aquifer or aquifer system that are not readily available, it shall employ its best efforts to comply with the request. The requested State may condition its compliance upon payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing such data or information.

4. Aquifer States shall, where appropriate, employ their best efforts to collect and process data and information in a manner that facilitates their utilization by the other aquifer States to which such data and information are communicated.

⁴⁴ See *Report of the United Nations Water Conference, Mar del Plata, 14–25 March 1977* (United Nations publication, Sales No. E.77.II.A.12), part one, p. 51 (recommendation 85).

⁴⁵ *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992* (see footnotes 30 and 31 above).

⁴⁶ ASEAN Agreement on the Conservation of Nature and Natural Resources (1985), Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992), Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1999), Convention on cooperation for the protection and sustainable use of the river Danube (1994), Convention for the Protection of the Rhine (1999), African Convention on the Conservation of Nature and Natural Resources (2003), Framework Convention on the Protection and Sustainable Development of the Carpathians (2003), Convention on the sustainable management of Lake Tanganyika (2003), and Protocol for Sustainable Development of Lake Victoria Basin (2003).

⁴⁷ See paragraph (4) of the commentary to draft article 4 above.

⁴⁸ See footnote 32 above.

⁴⁹ The European Union water framework Directive requires member States to establish a management plan. See also guidelines 2 and 8 of the Guidelines on Monitoring and Assessment of Transboundary Groundwaters of the UNECE, Institute for Inland Water Management and Waste Water Treatment, *UN/ECE Task Force on Monitoring & Assessment under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992): Work programme 1996/1999*. See also Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration, *Official Journal of the European Communities*, No. L 372 of 27 December 2006, p. 19.

⁵⁰ African Union: paragraph 3 of article VII (Water) of the African Convention on the Conservation of Nature and Natural Resources, and SADC: article 5 (Institutional framework for implementation) of the Revised Protocol on Shared Watercourses in the Southern African Development Community.

Commentary

(1) Exchange of data and information on a regular basis is the first step for cooperation among aquifer States. The text of article 9 of the 1997 Watercourses Convention has been adjusted to meet the special characteristics of aquifers. It sets out the general and minimum requirements for the exchange between aquifer States of the data and information necessary to ensure the equitable and reasonable utilization of transboundary aquifers. Aquifer States require data and information concerning the condition of the aquifer in order to apply draft article 5, which calls for aquifer States to take into account “all relevant factors” and circumstances in implementing the obligation of equitable and reasonable utilization laid down in draft article 4. The rules contained in draft article 8 are residual. They apply in the absence of specially agreed regulation of the subject and they do not prejudice the regulation set out by an arrangement concluded among the States concerned for a specific transboundary aquifer. In fact, the need is clear for aquifer States to conclude such agreements among themselves in order to provide, *inter alia*, for the collection and exchange of data and information in the light of the characteristics of the transboundary aquifer concerned.

(2) The requirement of paragraph 1 that data and information be exchanged on a regular basis is designed to ensure that aquifer States will have the facts necessary to enable them to comply with their obligations under draft articles 4, 5 and 6. In requiring the “regular” exchange of data and information, paragraph 1 provides for an ongoing and systematic process, as distinct from the *ad hoc* provision of such information as concerning planned activities envisaged in draft article 15. Paragraph 1 requires that aquifer States exchange data and information that are “readily available”. This expression is used to indicate that, as a matter of general legal duty, an aquifer State is under an obligation to provide only such data and information as is at its disposal readily, for example, that it has already collected for its own use or is easily accessible. In a specific case, whether data and information are “readily” available depends on an objective evaluation of such factors as the efforts and costs that their provision would entail, taking into account the human, technical, financial and other relevant resources of the requested aquifer State. The term “readily”, as used in paragraphs 1 and 3, is thus a term of art having a meaning corresponding roughly to the expression “in the light of all the relevant circumstances” or to the word “feasible”, rather than, for example, “rationally” or “logically”. The importance of the exchange of data and information is indicated in a wide variety of agreements.⁵¹

⁵¹ Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992), Programme for the Development of a Regional Strategy for the utilisation of the Nubian Sandstone Aquifer System (2000), Framework Convention on the Protection and Sustainable Development of the Carpathians (2003), African Convention on the Conservation of Nature and Natural Resources (2003), Convention on cooperation for the protection and sustainable use of the river Danube (1994), Tripartite Interim Agreement Between the Republic of Mozambique, the Republic of South Africa and the Kingdom of Swaziland for Co-operation on the Protection and Sustainable Utilisation of the Water Resources of the Incomati and Maputo Watercourses (2002), Framework Agreement on the Sava River Basin (2002), Convention on the sustainable management of Lake Tanganyika (2003),

(3) The phrase in paragraph 1 “in particular of a geological, hydrogeological, hydrological, meteorological and ecological nature and related to the hydrochemistry of the aquifers or aquifer systems” relates to the data and information that define and distinguish characteristics of the aquifer. “Geology” describes the age, composition and structure of the aquifer matrix. “Hydrogeology” describes the ability of the aquifer to store, transmit and discharge groundwaters. “Hydrology” describes elements other than groundwaters of the water cycle, primarily effective precipitation and surface water that are important for aquifer recharge, the aquifer regime, storage and discharge. Effective precipitation is the part of precipitation which enters aquifers. In other words, it is total precipitation minus evaporation, surface run-off and water retained by vegetation. “Meteorology” provides data on precipitation, temperature and humidity which is necessary to calculate evaporation. “Ecology” provides data on plants necessary to calculate plants’ transpiration. “Hydrochemistry” yields data on chemical composition of the water necessary to define water quality. Aquifer States are required by paragraph 1 to exchange not only data and information on the present condition of the aquifer, but also related forecasts. The forecasts envisaged would relate to such matters as weather patterns and the possible effects thereof upon water levels and flow; the amount of recharge and discharge; foreseeable ice conditions; possible long-term effects of present utilization; and the condition or movement of living resources. The requirement in paragraph 1 applies even in the relatively rare instances in which an aquifer State is not utilizing, or has no plan of utilizing, the transboundary aquifer.

(4) Paragraph 2 is formulated recognizing full well that there is a lack of information and knowledge regarding the nature and scope of some aquifers. Data and information in this draft article relate to data and information concerning the conditions of aquifers. Such data and information include not only raw statistics, but also the results of research and analysis. Data and information concerning monitoring, utilization of aquifers, other activities affecting aquifers and their impact on aquifers are dealt with in later draft articles. There is also the need to encourage States to establish inventories of aquifers. Many States are still unaware of the extent, quality and quantity of their aquifers.

(5) Paragraph 3 concerns requests for data or information that are not readily available in the State from which they are sought. In such cases, the State in question is to employ its “best efforts” to comply with the request. It is to act in good faith and in a spirit of cooperation in endeavouring to provide the data or information sought by the requesting aquifer State. In the absence of agreement to the contrary, aquifer States are not required to process the data and information to be exchanged. Under paragraph 3, however, they are to employ their best efforts to comply with the request. However, the requested State

Protocol for Sustainable Development of Lake Victoria Basin (2003), Protocol amending the 1978 Agreement between the United States of America and Canada on Great Lakes water quality, as amended in 1983 (signed at Toledo on 18 November 1987, United Nations, *Treaty Series*, vol. 2185, No. 18177, p. 504), and Agreement on cooperation for the protection and sustainable use of the waters of the Spanish–Portuguese hydrographic basins (signed at Albufeira on 30 November 1998, *ibid.*, vol. 2099, No. 36496, p. 314).

may condition its compliance with the request on payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing the data. The expression “where appropriate” is used in order to provide a measure of flexibility, which is necessary for several reasons. In some cases, it may not be necessary to process data and information in order to render it usable by another State. In other cases, such processing may be necessary in order to ensure that the material is usable by other States, but this may entail undue burdens for the State providing the material.

(6) For data and information to be of practical value to aquifer States, they must be in a form which allows them to be easily usable. Paragraph 4 therefore requires aquifer States to use their “best efforts to collect and process data and information in a manner that facilitates their utilization” by the other aquifer State. A collective effort should be made to integrate and make compatible, whenever possible, existing databases of information.

Article 9. *Bilateral and regional agreements and arrangements*

For the purpose of managing a particular transboundary aquifer or aquifer system, aquifer States are encouraged to enter into bilateral or regional agreements or arrangements among themselves. Such agreements or arrangements may be entered into with respect to an entire aquifer or aquifer system or any part thereof or a particular project, programme or utilization except insofar as an agreement or arrangement adversely affects, to a significant extent, the utilization, by one or more other aquifer States of the water in that aquifer or aquifer system, without their express consent.

Commentary

(1) The importance of bilateral or regional agreements and arrangements that take due account of the historical, political, social and economic characteristics of the region and of the specific transboundary aquifer must be stressed. The draft article has thus been placed in Part II dealing with general principles. The first sentence of the draft article calls upon the aquifer States to cooperate among themselves and encourages them to enter into bilateral or regional agreements or arrangements for the purpose of managing the particular transboundary aquifer. The concept of reserving the matter to the group of aquifer States concerned with the particular aquifer is based on the principles that are set forth in the United Nations Convention on the Law of the Sea.⁵² It also corresponds to the “watercourse agreements” provided for in article 3 of the 1997 Watercourses Convention. In the case of surface watercourses, numerous bilateral and regional agreements have been concluded. In the case of aquifers, international collective measures are still in an embryonic stage and the framework for cooperation remains to be properly developed. Therefore, the term “arrangements” has been used in addition to “agreements”.

⁵² United Nations Convention on the Law of the Sea, article 118 (Co-operation of States in the conservation and management of living resources) and article 197 (Co-operation on a global or regional basis).

(2) This draft article also provides that the States concerned should have equal opportunity to participate in such agreements or arrangements. Such agreements or arrangements may be entered into with respect to an entire aquifer or aquifer system or any part thereof or a particular project, programme or utilization. When an agreement or arrangement is for the entire aquifer or aquifer system, all the aquifer States sharing the same aquifer or aquifer system are most likely to be involved except for some rare cases. On the other hand, when an agreement or arrangement is for any part of the aquifer or for a particular project, only a few of the aquifer States sharing the same aquifer would be involved. In any event, the second sentence obligates the aquifer States not to enter into an agreement or arrangement which would adversely affect, to a significant extent, the position of the excluded aquifer States without their express consent. It is not meant to give a veto power to those other States. The determination of adverse effect to a significant extent to the excluded aquifer States would have to be made only on a case-by-case basis.

PART III

**PROTECTION, PRESERVATION
AND MANAGEMENT**

Article 10. *Protection and preservation of ecosystems*

Aquifer States shall take all appropriate measures to protect and preserve ecosystems within, or dependent upon, their transboundary aquifers or aquifer systems, including measures to ensure that the quality and quantity of water retained in an aquifer or aquifer system, as well as that released through its discharge zones, are sufficient to protect and preserve such ecosystems.

Commentary

(1) Draft article 10 introduces Part III by laying down a general obligation to protect and preserve the ecosystems within a transboundary aquifer and also the outside ecosystems dependent on the aquifer by ensuring adequate quality and sufficient quantity of discharge water. Like article 192 of the United Nations Convention on the Law of the Sea and article 20 of the 1997 Watercourses Convention, draft article 10 contains obligations of both protection and preservation. These obligations relate to the “ecosystems” within and outside transboundary aquifers. “Ecosystem” refers generally to an ecological unit consisting of living and non-living components that are interdependent and function as a community. An external impact affecting one component of an ecosystem may cause reactions among other components and may disturb the equilibrium of the entire ecosystem, resulting in impairing or destroying the ability of an ecosystem to function as a life-support system.

(2) There are certain differences in the modalities of the protection and preservation of the ecosystem within aquifers and those of the outside ecosystems dependent on the aquifers. Protection and preservation of aquatic ecosystems within the aquifers help to ensure their continued viability as life-support systems. Protection and preservation of the quality and quantity of the discharge

water exert great influence on the outside ecosystems such as in oases and lakes. Protection and preservation of the ecosystems in the recharge and discharge zones by non-aquifer States are to be governed by draft article 11, paragraph 2.

(3) The obligation to “protect” the ecosystems requires the aquifer States to shield the ecosystems from harm or damage. The obligation to “preserve” the ecosystems applies in particular to freshwater ecosystems that are in a pristine or unspoiled condition. It requires that these ecosystems be treated in such a way as to maintain, as much as possible, their natural state. Together, protection and preservation of aquatic ecosystems help to ensure their continued viability as life-support systems.

(4) The obligation of States to take “all appropriate measures” is limited to the protection of relevant ecosystems. This allows States greater flexibility in the implementation of their responsibilities under this provision. It was noted, in particular, that there may be instances in which changing an ecosystem in some appreciable way may be justified by other considerations, including the planned usage of the aquifer in accordance with the draft articles.

(5) There are ample precedents for the obligation contained in draft article 10 in the practice of States and the works of international organizations. The ASEAN Agreement on the Conservation of Nature and Natural Resources (1985) provides for the obligation of conservation of species and ecosystems and conservation of ecological processes. The Convention on the Protection and Use of Transboundary Watercourses and International Lakes sets out the obligation to “ensure conservation and, where necessary, restoration of ecosystems” (art. 2). The Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes provides for the obligation to “take all appropriate measures for the purpose of ensuring ... [e]ffective protection of water resources used as sources of drinking water, and their related water ecosystems, from pollution from other causes” (art. 4). The Tripartite Interim Agreement Between the Republic of Mozambique, the Republic of South Africa and the Kingdom of Swaziland for Co-operation on the Protection and Sustainable Utilisation of the Water Resources of the Incomati and Maputo Watercourses (2002) provides that “[t]he Parties shall, individually and, where appropriate, jointly, take all measures to protect and preserve the ecosystems of the Incomati and Maputo watercourses” (art. 6). The Protocol for Sustainable Development of Lake Victoria Basin (2003) provides for the obligation to “take all appropriate measures, individually or jointly and where appropriate with participation of all stakeholders to protect, conserve and where necessary rehabilitate the Basin and its ecosystems”.

Article 11. Recharge and discharge zones

1. Aquifer States shall identify the recharge and discharge zones of transboundary aquifers or aquifer systems that exist within their territory. They shall take appropriate measures to prevent and minimize detrimental impacts on the recharge and discharge processes.

2. All States in whose territory a recharge or discharge zone is located, in whole or in part, and which are not aquifer States with regard to that aquifer or aquifer system, shall cooperate with the aquifer States to protect the aquifer or aquifer system and related ecosystems.

Commentary

(1) Groundwater experts explain the importance of the measures to be taken for the protection and preservation of recharge and discharge zones in order to ensure the proper functioning of an aquifer. Maintenance of a normal recharge or a discharge process is vital for the proper functioning of aquifers. Pursuant to the definition of “aquifer” in paragraph (a) of draft article 2, recharge or discharge zones are located outside aquifers. Accordingly, a separate draft article is required to regulate such zones. Paragraph 1 deals with the obligations of aquifer States with regard to the protection of recharge and discharge zones that exist within their territory. There are two phases for implementing such obligations. The first is to identify the recharge or discharge zones and the second is to take appropriate measures to prevent and/or minimize detrimental impacts on the recharge and discharge process. Once the recharge and discharge zones are identified and as far as they are located in the territories of the aquifer States concerned, those States are under the obligation to take appropriate measures to minimize detrimental impacts on recharge and discharge processes. Such measures play a pivotal role for the protection and preservation of the aquifer. It is noted that it is vitally important to take all measures in recharge zones to prevent pollutants from entering the aquifer. However, the obligation to protect the recharge zone from polluting the aquifers is dealt with in the context of draft article 12 which deals specifically with pollution.

(2) Paragraph 2 deals with the case where the recharge or discharge zone of a particular transboundary aquifer is located in a State other than the aquifer State that shares the transboundary aquifer in question. Considering the importance of the recharge and discharge process, a non-aquifer State in whose territory a recharge or discharge zone is located is required to cooperate with aquifer States to protect the aquifer and its related ecosystem. It should be recalled, in this regard, that aquifer States are themselves covered by the general duty to cooperate in draft article 7.

Article 12. Prevention, reduction and control of pollution

Aquifer States shall, individually and, where appropriate, jointly, prevent, reduce and control pollution of their transboundary aquifers or aquifer systems, including through the recharge process, that may cause significant harm to other aquifer States. Aquifer States shall take a precautionary approach in view of uncertainty about the nature and extent of a transboundary aquifer or aquifer system and of its vulnerability to pollution.

Commentary

(1) Draft article 12 sets forth the general obligation of aquifer States to prevent, reduce and control pollution of

their transboundary aquifers that may cause significant harm to other aquifer States through the transboundary aquifers and the aquifer-related environment. The problem dealt with here is essentially the quality of water contained in the aquifers. This provision is a specific application of the general principles contained in draft articles 4 and 6.

(2) Some transboundary aquifers are already polluted to varying degrees, while others are not. In view of this state of affairs, draft article 12 employs the formula “prevent, reduce and control” in relation to pollution. This expression is used in the 1982 United Nations Convention on the Law of the Sea in connection with marine pollution and in the 1997 Watercourses Convention.⁵³ With respect to both the marine environment and international watercourses, the situation is similar. The obligation to “prevent” relates to new pollution, while the obligations to “reduce” and “control” relate to existing pollution. As with the obligation to “protect” ecosystems under draft article 10, the obligation to “prevent ... pollution ... that may cause significant harm” includes the duty to exercise due diligence to prevent the threat of such harm. This obligation is signified by the words “may cause”. The requirement that aquifer States “reduce and control” existing pollution reflects the practice of States. A requirement that existing pollution causing such harm be abated immediately could, in some cases, result in undue hardship, especially where the detriment to an aquifer State of origin would be grossly disproportionate to the benefit that would accrue to an aquifer State experiencing the harm. On the other hand, failure of the aquifer 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.

(3) This draft article requires that the measures in question be taken “individually and, where appropriate, jointly”. The obligation to take joint action derives from certain general obligations contained in draft article 7, in particular in its paragraph 2.

(4) The obligations of prevention, reduction and control all apply to pollution “that may cause significant harm to other aquifer States”. Pollution below that threshold might not fall within the present article but, depending upon the circumstances, might be covered by draft article 10.

(5) The second sentence of this draft article obligates aquifer States to take a “precautionary approach”. Considering the fragility and scientific uncertainty of aquifers, a precautionary approach is required. The Commission was well aware of the differing views on the concept of “precautionary approach” as opposed to that of “precautionary principle”. It decided to opt for the term “precautionary approach” because it is the less disputed formulation, on the understanding that the two concepts lead to similar results in practice when applied in good faith. It is true that there are several regional treaties or conventions in

which “precautionary principle” is expressly mentioned.⁵⁴ As far as universal treaties or conventions are concerned, different expressions, such as “precautionary approach” and “precautionary measures” are used.⁵⁵

Article 13. Monitoring

1. Aquifer States shall monitor their transboundary aquifers or aquifer systems. They shall, wherever possible, carry out these monitoring activities jointly with other aquifer States concerned and, where appropriate, in collaboration with competent international organizations. Where monitoring activities cannot be carried out jointly, the aquifer States shall exchange the monitored data among themselves.

2. Aquifer States shall use agreed or harmonized standards and methodology for monitoring their transboundary aquifers or aquifer systems. They should identify key parameters that they will monitor based on an agreed conceptual model of the aquifers or aquifer systems. These parameters should include parameters on the condition of the aquifer or aquifer system as listed in draft article 8, paragraph 1, and also on the utilization of the aquifers or aquifer systems.

Commentary

(1) Draft article 13 applies to aquifer States and serves as precursor to draft article 14 on management. Most groundwater experts (scientists and administrators) emphasize that monitoring is indispensable for the proper management of a transboundary aquifer. In practice, monitoring is usually initiated individually by the State concerned, and also in many cases by local government, and develops later into a joint effort with the neighbouring States concerned. However, experts agree that the ultimate and ideal monitoring is joint monitoring based on an agreed conceptual model of the aquifer. Where it is not feasible for the aquifer States to act jointly, it is important that they share data on their monitoring activities.

⁵⁴ The Convention for the protection of the marine environment of the North-East Atlantic, 1992 (OSPAR Convention), the Convention on the protection of the marine environment of the Baltic Sea (1992), the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (1995), the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992), the Treaty establishing the European Economic Community (1957), the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (1991), the Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1999), the Framework Convention on the Protection and Sustainable Development of the Carpathians (2003), the Convention on cooperation for the protection and sustainable use of the river Danube (1994), the Convention on the Protection of the Rhine (1999), the Convention on the sustainable management of Lake Tanganyika (2003), and the Protocol for Sustainable Development of Lake Victoria Basin (2003).

⁵⁵ For example, the 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995) use the expression “precautionary approach”. The United Nations Framework Convention on Climate Change (1992) provides for the obligation to take “precautionary measures”.

⁵³ See, for example, the United Nations Convention on the Law of the Sea, article 195 (Duty not to transfer damage or hazards or transform one type of pollution into another) and article 196 (Use of technologies or introduction of alien or new species) and the 1997 Watercourses Convention, article 21 (Prevention, reduction and control of pollution).

(2) Paragraph 1 sets forth the general obligation to monitor and the sequence of such monitoring activities, whether jointly or individually. The purposes of monitoring are to: (a) clarify the conditions and utilization of a specific transboundary aquifer in order to take effective measures for its protection, preservation and management; and (b) keep regular surveillance of the aquifer in order to acquire the information about any change or damage at an early stage. Monitoring needs to cover not only the conditions of the aquifer but also utilization of the aquifer such as withdrawal and artificial recharge of water. Effective monitoring through international cooperation will also contribute to further development of scientific knowledge about transboundary aquifers. The importance of monitoring is widely recognized in many international instruments, for example, the Charter on Ground-water Management 1989⁵⁶ and the Guidelines on Monitoring and Assessment of Groundwaters 2000,⁵⁷ both prepared by UNECE; the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes; and the African Convention on the Conservation of Nature and Natural Resources.

(3) There are various international instruments that provide for joint monitoring of a specific transboundary aquifer. The Programme for the Development of a Regional Strategy for the utilisation of the Nubian Sandstone Aquifer System established in 2000 provides an example. One of the agreements for the execution of this programme is the Terms of Reference for Monitoring and Exchange of Groundwater Information.⁵⁸ The 2003 Framework Convention on the Protection and Sustainable Development of the Carpathians also provides for the obligation to pursue the policies aiming at joint or complementary monitoring programmes, including the systematic monitoring of the state of the environment. The 1994 Convention on cooperation for the protection and sustainable use of the river Danube provides not only for an obligation to harmonize individual monitoring, but also for an obligation to elaborate and implement joint programmes for monitoring the riverine conditions in the Danube catchment area concerning water quality and quantity, sediments and the riverine ecosystem. The European Union water framework Directive 2000/60/EC sets out that “Member States shall ensure the establishment of programmes for the monitoring of water status in order to establish a coherent and comprehensive overview of water status within each river basin district” (art. 8).⁵⁹

(4) Where the aquifer States can agree to establish such a joint mechanism, it is the most effective approach. However, there are many cases where the aquifer States concerned have not yet initiated any consultation or have not yet reached any agreement to establish a joint mechanism. Even in such cases, they are, at least, under an

obligation to conduct individual monitoring and share the result with the other aquifer States concerned. The 2003 African Convention on the Conservation of Nature and Natural Resources sets out the obligation of each party to monitor the status of their natural resources as well as the impact of development activities and projects upon such resources. The 2003 Convention on the sustainable management of Lake Tanganyika includes the obligation of monitoring in the provision for the prevention and control of pollution. The 2003 Protocol for Sustainable Development of Lake Victoria Basin provides for the obligation of monitoring undertaken by individual States in a standardized and harmonized manner.

(5) Draft article 13 is also related to draft article 8 on regular exchange of data and information. For the implementation of the obligation of regular exchange of data and information, effective monitoring is required. However, the data and information required by draft article 8 are limited to those concerning the condition of the aquifer. Paragraph 2 addresses more directly the modalities and parameters for monitoring. It provides the essential elements of the obligation of aquifer States to realize effective monitoring, i.e. the agreement or harmonization of the standard and the methodology for monitoring. It is important that aquifer States agree on the standards and methodology to be used for monitoring or on means to have their different standards or methodology harmonized as a common indicator for monitoring. Without such agreement or harmonization, collected data would not be useful. Before a State can use data collected by other States, it must first understand when, where, why and how such data were collected. With such “metadata” (data about data), the State can independently assess the quality of those data sets and, if they meet their minimum data standards, the State can proceed with harmonizing available data and interpreting the consolidated database. In the case of the Franco-Swiss Genevese Aquifer Management Commission, the two sides started with their own data standards and, with time and practice, reached the level of harmonized data. The aquifer States should also agree on the conceptual model of the specific aquifer in order to be able to select key parameters that they will monitor. There are two kinds of conceptual models. One is the physical matrix and the other is the hydrodynamic model. The aquifer States can agree on a model at the beginning and then change it as they gain better knowledge of the aquifer as a result of monitoring. Key parameters to be monitored include the condition of the aquifer and the utilization of the aquifer. The data on the condition of the aquifer relate to extent, geometry, flow path, hydrostatic pressure distribution, quantities of flow, hydrochemistry, etc., and are equivalent to those fields listed in paragraph 1 of draft article 8.

(6) The 2002 Tripartite Interim Agreement between the Republic of Mozambique, the Republic of South Africa and the Kingdom of Swaziland for Co-operation on the Protection and Sustainable Utilisation of the Water Resources of the Incomati and Maputo Watercourses sets out the obligation of each party to establish comparable monitoring systems, methods and procedures and implement a regular monitoring programme, including biological and chemical aspects for the Incomati and Maputo watercourses and report, at the intervals established by the Tripartite Permanent Technical Committee, on the status and trends of the associated aquatic, marine and

⁵⁶ Adopted by UNECE in 1989. See *Charter on Ground-Water Management* (United Nations publication, Sales No. E.89.II.E.21), document E/ECE/1197-ECE/ENVWA/12.

⁵⁷ Drafted by the UNECE Task Force on Monitoring and Assessment under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes and endorsed by the parties to the Convention in March 2000 (see footnote 49 above).

⁵⁸ These agreements were prepared within the framework of the programme but are not yet in force.

⁵⁹ See footnote 32 above.

riparian ecosystems in relation to the water quality of the said watercourses. The 2002 Framework Agreement on the Sava River Basin provides for the obligation of the parties to agree to establish a methodology of permanent monitoring of implementation of the Agreement and activities based upon it.

(7) While the general obligations are formulated in mandatory language, the modalities for achieving compliance with the main obligations remain recommendatory, in order to facilitate compliance by States. Monitoring would generally be less important when the aquifer or aquifer system is not utilized.

Article 14. Management

Aquifer States shall establish and implement plans for the proper management of their transboundary aquifers or aquifer systems. They shall, at the request of any of them, enter into consultations concerning the management of a transboundary aquifer or aquifer system. A joint management mechanism shall be established, wherever appropriate.

Commentary

(1) Draft article 14 sets out the obligation of the aquifer States to establish and implement plans for the proper management of their transboundary aquifers. In view of the sovereignty over the aquifer located in the State's territory and the need for cooperation among aquifer States, two kinds of obligations are introduced in the present draft article: first, the obligation of each aquifer State to establish its own plan with regard to its aquifer and to implement it; and second, the obligation to enter into consultations with other aquifer States concerned at the request of any of the latter States.

(2) Paragraph 2 of article 24 of the 1997 Watercourses Convention provides that "management" refers, in particular, to: (a) [p]lanning of the sustainable development of an international watercourse and providing for the implementation of any plans adopted; and (b) [o]therwise promoting the rational and optimal utilization, protection and control of the watercourse". Exactly the same definition is accepted in the 2000 Revised Protocol on Shared Watercourses in the Southern African Development Community. This Protocol entered into force in 2003. Such a definition could be used in the present subject *mutatis mutandis*, bearing in mind draft article 4.

(3) The rules in relation to the management of transboundary aquifers are provided in Part II. The obligations to utilize them in an equitable and reasonable manner, not to cause harm to other aquifer States and to cooperate with other aquifer States are the basis of the proper management of transboundary aquifers. The term "management" encompasses the measures to be taken for the maximization of the long-term benefits derived from the utilization of aquifers. It also includes the protection and preservation of transboundary aquifers.

(4) It is understood that the principles provided by the present draft articles are intended to provide a framework to assist States in elaborating plans of management of the

aquifers. Consultations among aquifer States are an essential component of the management process. There is great value in the joint management of aquifers and it should be done wherever appropriate and possible. However, it is also recognized that in practice it may not always be possible to establish such a mechanism. Thus the establishment and implementation of such plans may be done individually or jointly.

(5) The Convention on the Protection and Use of Transboundary Watercourses and International Lakes provides for the obligation to manage water resources "so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs" (art. 2). The 1999 Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes further clarifies the elements to be considered for the purpose of water management. The Framework Convention on the Protection and Sustainable Development of the Carpathians sets out the obligation of "river basin management" (art. 4). The African Convention on the Conservation of Nature and Natural Resources provides for the obligation to "manage their water resources so as to maintain them at the highest possible quantitative and qualitative levels" (art. VII).

(6) There are some examples in which a regional institution or mechanism is established for the purpose of the management of a specific water regime. The 2000 Revised Protocol on Shared Watercourses in the Southern African Development Community "seeks to: ... promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses" (art. 2). The 2002 Framework Agreement on the Sava River Basin provides for the obligation to "cooperate ... to achieve [the e]stablishment of sustainable water management" (art. 2). It also sets out the obligation "to develop joint and/or integrated Plan on the management of the water resources of the Sava River Basin" (art. 12). The 2003 Convention on the sustainable management of Lake Tanganyika sets out the obligation of the management of the natural resources of Lake Tanganyika and establishes the Lake Tanganyika Authority. One of the functions of this Authority is to advance and represent the common interest of the contracting States in matters concerning the management of Lake Tanganyika and its Basin. The 2003 Protocol for Sustainable Development of Lake Victoria Basin provides for the obligations of parties and the Commission established by this Protocol with regard to the management plans for the conservation and the sustainable utilization of the resources of the Basin.

Article 15. Planned activities

1. When a State has reasonable grounds for believing that a particular planned activity in its territory may affect a transboundary aquifer or aquifer system and thereby may have a significant adverse effect upon another State, it shall, as far as practicable, assess the possible effects of such activity.

2. Before a State implements or permits the implementation of planned activities which may affect a

transboundary aquifer or aquifer system and thereby may have a significant adverse effect upon another State, it shall provide that State with timely notification thereof. Such notification shall be accompanied by available technical data and information, including any environmental impact assessment, in order to enable the notified State to evaluate the possible effects of the planned activities.

3. If the notifying and the notified States disagree on the possible effect of the planned activities, they shall enter into consultations and, if necessary, negotiations with a view to arriving at an equitable resolution of the situation. They may utilize an independent fact-finding body to make an impartial assessment of the effect of the planned activities.

Commentary

(1) It is recalled that the 1997 Watercourses Convention has nine articles with detailed provisions on planned activities on the basis of State practice. In contrast, a minimalist approach is taken in this draft article due to the scarcity of State practice with respect to aquifers. The draft article applies to any State that has reasonable ground for believing that a planned activity in its territory could affect a transboundary aquifer and thereby cause a significant adverse effect on another State. Thus, the provision does not apply only to aquifer States.

(2) The activities to be regulated in this draft article could be carried out either by organs of States or by private enterprises. This draft article sets out a sequence of actions or procedures that may be contemplated. Paragraph 1 sets out the minimum obligation of a State to undertake prior assessment of the potential effect of the planned activity. A State is required to assess the potential effects of the planned activity only when it has reasonable grounds for anticipating the probability of adverse effects. Moreover, the State is not under this obligation if the assessment is not practicable. Planned activities include not only utilization of transboundary aquifers but also other activities that have or are likely to have an impact upon those aquifers.

(3) The obligation of the assessment by a State that is planning an activity is provided in a wide variety of treaties and conventions. For example, the 1985 ASEAN Agreement on the Conservation of Nature and Natural Resources sets forth the obligation to “endeavour ... to make environmental impact assessment before engaging in any activity that may create a risk of significantly affecting the environment or the natural resources of another Contracting Party or the environment or natural resources beyond national jurisdiction” (art. 20). The 2003 African Convention on the Conservation of Nature and Natural Resources provides for the obligation to “ensure that policies, plans, programmes, strategies, projects and activities likely to affect natural resources, ecosystems and the environment in general are the subject of adequate impact assessment at the earliest possible stage” (art. XIV). The 1998 Agreement on cooperation for the protection and sustainable use of the waters of the Spanish–Portuguese hydrographic basins provides that “[t]he Parties shall adopt the necessary provisions to ensure that

projects and activities covered by this Agreement which, owing to their nature, size and location, must be subjected to transborder impact assessment are so assessed before they are approved” (art. 9).⁶⁰ Furthermore, the Protocol on Environmental Protection to the Antarctic Treaty, in its article 8, provides that all activities in the Antarctic Treaty area shall be subject to environmental impact assessment procedures.

(4) The importance of the environmental impact assessment is also indicated in the instruments prepared by the United Nations. For example, the Charter on Groundwater Management (1989) prepared by UNECE provides that “[a]ll projects in any economic sector expected to affect aquifers adversely should be subject to an assessment procedure aiming at evaluating the project’s possible impact on the water regime and/or the quality of groundwater resources, with particular attention to the important role groundwater plays in the ecological system” (art. XIV).⁶¹ Chapter 18 of Agenda 21 on the Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources, of the 1992 United Nations Conference on Environment and Development, suggests that all States should implement “[m]andatory environmental impact assessment of all major water resource development projects potentially impairing water quality and aquatic ecosystems.”⁶²

(5) The results from the assessment contribute to the sound planning of the activity. They also constitute the basis for the further procedures in paragraphs 2 and 3. Those paragraphs establish a procedural framework designed to avoid disputes relating to planned activities. When the assessment of the potential effects of a planned activity conducted in accordance with paragraph 1 indicates that such activity would cause adverse effect on the transboundary aquifers and that it may have a significant adverse effect on other States, the State of origin is obliged under paragraph 2 to notify the States concerned of its finding. Such timely notification is to be accompanied by available technical data and information, including environmental impact assessment, and is to provide the potentially affected States with the necessary information to make their own evaluation of the possible effects of the planned activity.

(6) If the notified States are satisfied with the information and the assessment provided by the notifying States, they have common ground to deal with the planned activity. On the other hand, if they disagree on the assessment of the effects of the planned activity, they have an obligation to endeavour to arrive at an equitable resolution of the situation in accordance with paragraph 3. The precondition to such resolution would be for the States concerned to have a common understanding of the possible effects. To that end, consultations, and, if necessary, negotiations or independent fact-finding are envisaged in this draft article with a view to reaching an equitable solution

⁶⁰ See footnote 51 above.

⁶¹ See footnote 56 above.

⁶² *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992* (see footnotes 30 and 31 above), para. 40.

to a particular situation. Article 33 of the 1997 Watercourses Convention provides for a compulsory recourse to such fact-finding. It seems that there exists no evidence as yet for such an obligation in relation to groundwaters. Accordingly, an optional reference to such a fact-finding mechanism is provided. The lack of explicit detailed procedures should not be construed as authorizing any action which would nullify the purpose of this draft article. For instance, the States concerned would in principle refrain, upon request, from implementing or permitting implementation of the planned activity during the course of the consultation or negotiation, which must be amicably completed within a reasonable period of time. The States concerned should act in good faith.

(7) The procedure provided for in this draft article is based on the criterion that the planned activity may have “a significant adverse effect” upon other States. This threshold of “significant adverse effect” is contingent and anticipatory and is lower than that of “significant harm” under draft article 6.

PART IV

MISCELLANEOUS PROVISIONS

Article 16. Technical cooperation with developing States

States shall, directly or through competent international organizations, promote scientific, educational, technical, legal and other cooperation with developing States for the protection and management of transboundary aquifers or aquifer systems, including, *inter alia*:

(a) strengthening their capacity-building in scientific, technical and legal fields;

(b) facilitating their participation in relevant international programmes;

(c) supplying them with necessary equipment and facilities;

(d) enhancing their capacity to manufacture such equipment;

(e) providing advice on and developing facilities for research, monitoring, educational and other programmes;

(f) providing advice on and developing facilities for minimizing the detrimental effects of major activities affecting their transboundary aquifer or aquifer system;

(g) providing advice in the preparation of environmental impact assessments;

(h) supporting the exchange of technical knowledge and experience among developing States with a view to strengthening cooperation among them in managing the transboundary aquifer or aquifer system.

Commentary

(1) Draft article 16 deals with technical cooperation with developing States. It should be highlighted that the term “cooperation” was preferred to the term “assistance” in this draft article; it better represents the two-sided process necessary to foster sustainable growth in developing States through the protection and management of aquifers or aquifer systems. Pursuant to the *chapeau* of draft article 16, States are required to promote scientific, educational, technical, legal and other cooperation for protection and management of transboundary aquifers and they may do so directly or through competent international organizations. Legal cooperation has been included on second reading. It is understood that the list of activities in the subparagraphs is neither cumulative nor exhaustive. The types of cooperation listed represent some of the various options available to States to fulfil the obligation to promote cooperation in the areas contemplated by the draft article. States are not required to engage in each of the types of cooperation listed, but will be allowed to choose their means of cooperation, including those not listed, such as financial assistance.

(2) The science of groundwaters, hydrogeology, is rapidly developing. Such new and rapidly developing scientific knowledge is mainly owned by developed States and is not yet fully shared by many developing States. Scientific and technical cooperation with developing States has been provided through the competent international organizations. UNESCO-IHP plays a central role in this field and is the global intergovernmental scientific programme of the United Nations system that can respond to specific national and regional needs and demands. The regional arrangements are also developing successfully due to a wide range of types of assistance rendered by the competent international organizations. In subparagraph (a), the broader concept of strengthening capacity-building is employed to emphasize the need for training, and in subparagraph (h), the need to provide support to the exchange of technical knowledge and experience among developing States is stressed.

(3) The obligation under this draft article is one of the modalities of cooperation among States and its roots are to be found in article 202 (Scientific and technical assistance to developing States) of the 1982 United Nations Convention on the Law of the Sea. The Stockholm Declaration⁶³ indicates the importance of technological assistance as a supplement to the domestic effort of the development and the special consideration of developing States for the purpose of development and environmental protection (Principles 9 and 12). The Rio Declaration⁶⁴ suggests the common but differentiated responsibilities in Principle 7. Principle 9 of this Declaration mentions that “States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies”.

⁶³ See footnote 33 above.

⁶⁴ See footnote 30 above.

(4) The elements of cooperation stipulated in this draft article are also mentioned in several conventions and treaties. The Convention on the Protection and Use of Transboundary Watercourses and International Lakes provides for the obligation of mutual assistance. The Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes emphasizes the importance of the “education and training of the professional and technical staff who are needed for managing water resources and for operating systems of water supply and sanitation” and of the “updating and improvement of their knowledge and skills” (art. 9). In its article 14, this Protocol enumerates the aspects in which international support for national action is required as follows:

(a) [p]reparation of water-management plans in transboundary, national and/or local contexts and of schemes for improving water supply and sanitation; (b) [i]mproved formulation of projects, especially infrastructure projects, in pursuance of such plans and schemes, in order to facilitate access to sources of finance; (c) [e]ffective execution of such projects; (d) [e]stablishment of systems for surveillance and early-warning systems, contingency plans and response capacities in relation to water-related disease; (e) [p]reparation of legislation needed to support the implementation of this Protocol; (f) [e]ducation and training of key professional and technical staff; (g) [r]esearch into, and development of, cost-effective means and techniques for preventing, controlling and reducing water-related disease; (h) [o]peration of effective networks to monitor and assess the provision and quality of water-related services, and development of integrated information systems and databases; (i) [a]chievement of quality assurance for monitoring activities, including inter-laboratory comparability.

It is also noted that the 1994 Convention to combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa provides a specific article regarding the obligations of developed country parties in article 6. It enumerates such obligations and one of them is to “promote and facilitate access by affected country Parties, particularly affected developing country Parties, to appropriate technology, knowledge and know-how”.

(5) The obligation of mutual cooperation is also provided in regional conventions. One of the examples is the 2003 African Convention on the Conservation of Nature and Natural Resources, which sets out the obligation to “encourage and strengthen cooperation for the development and use, as well as access to and transfer of, environmentally sound technologies on mutually agreed terms”, and, to this effect, to “adopt legislative and regulatory measures which provide for, inter alia, economic incentives for the development importation, transfer and utilization of environmentally sound technologies in the private and public sectors” (art. XIX).

(6) The importance of the scientific and technical assistance is also mentioned in other non-binding declarations. The Mar del Plata Action Plan adopted in the United Nations Water Conference in 1977 points out the lack of sufficient scientific knowledge about water resources. With regard to groundwater, it recommends that the countries should:

(i) Offer assistance for the establishment or strengthening of observational networks for recording quantitative and qualitative characteristics of ground-water resources; (ii) Offer assistance for the establishment of ground-water data banks and for reviewing the studies, locating gaps and formulating programmes of future investigations and prospection;

(iii) Offer help, including personnel and equipment, to make available the use of advanced techniques, such as geophysical methods, nuclear techniques, mathematical models etc.⁶⁵

(7) Chapter 18 of Agenda 21 adopted in the United Nations Conference on Environment and Development (1992) points out that one of the four principal objectives to be pursued is “[t]o identify and strengthen or develop, as required, in particular in developing countries, the appropriate institutional, legal and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth”.⁶⁶ And it suggests that:

[a]ll States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities to improve integrated water resources management: ... Development and strengthening, as appropriate, of cooperation, including mechanisms where appropriate, at all levels concerned, namely: ... (iv) At the global level, improved delineation of responsibilities, division of labour and coordination of international organizations and programmes, including facilitating discussions and sharing of experiences in areas related to water resources management.⁶⁷

It also points out that one of the three objectives to be pursued concurrently to integrate water-quality elements into water resource management is “human resources development, a key to capacity-building and a prerequisite for implementing water-quality management”.⁶⁸ The Plan of Implementation of the World Summit on Sustainable Development (2002) also mentions technical assistance.⁶⁹

Article 17. Emergency situations

1. For the purpose of the present draft article, “emergency” means a situation, resulting suddenly from natural causes or from human conduct, that affects a transboundary aquifer or aquifer system and poses an imminent threat of causing serious harm to aquifer States or other States.

2. The State within whose territory the emergency originates shall:

(a) without delay and by the most expeditious means available, notify other potentially affected States and competent international organizations of the emergency;

(b) in cooperation with potentially affected States and, where appropriate, competent international organizations, immediately take all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate any harmful effect of the emergency.

⁶⁵ *Report of the United Nations Water Conference* (see footnote 44 above), pp. 9–10 (recommendation 4 (b)).

⁶⁶ *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992* (see footnote 30 above), para. 9 d.

⁶⁷ *Ibid.*, para. 12.

⁶⁸ *Ibid.*, para. 38 c.

⁶⁹ *Report of the World Summit on Sustainable Development, Johannesburg (South Africa), 26 August–4 September 2002* (A/CONF.199/20, United Nations publication, Sales No. E.03.II.A.1), chap. I, resolution 2 (Plan of Implementation of the World Summit *Report of the United Nations Conference on Sustainable Development*, of 4 September 2002, Annex, chap. IV, para. 25).

3. Where an emergency poses a threat to vital human needs, aquifer States, notwithstanding draft articles 4 and 6, may take measures that are strictly necessary to meet such needs.

4. States shall provide scientific, technical, logistical and other cooperation to other States experiencing an emergency. Cooperation may include coordination of international emergency actions and communications, making available emergency response personnel, emergency response equipment and supplies, scientific and technical expertise and humanitarian assistance.

Commentary

(1) Draft article 17 deals with the obligations of States in responding to actual emergency situations that are related to transboundary aquifers. The 1997 Watercourses Convention contains a similar provision in article 28. In the case of aquifers, emergencies might not be as numerous and destructive as in the case of watercourses. However, an article on this aspect is necessary in view, for example, of the devastating tsunami disaster along the coast of the Indian Ocean, which resulted from a great earthquake that occurred off Banda Aceh, Indonesia, in December 2004. A tsunami or cyclone could flood seawater into an aquifer or an earthquake could destroy an aquifer.

(2) Paragraph 1 gives the definition of “emergency” for the purposes of the draft article. The commentary to paragraph 1 of article 28 of the 1997 Watercourses Convention explains that the definition of “emergency” contains a number of important elements, and includes several examples that are provided for purposes of illustration. As defined, an “emergency” must cause, or pose an imminent threat of causing, “serious harm” to other States. The seriousness of the harm involved, together with the suddenness of the emergency’s occurrence, justifies the measures required by the draft article. The element of “suddenness” is crucial for the application of the draft article. However, it also covers instances that could be predicted by weather forecast. Moreover, it may include creeping situations, including those that occur suddenly but are a consequence of factors accumulated over a period of time. The term “imminent threat” has a factual meaning which should not be conflated with notions associated with threats to international peace and security and any attendant consequences that may ensue in accordance with the Charter of the United Nations. The term “serious harm” means harm more grave than “significant harm”. Finally, the situation may result either “from natural causes or from human conduct”.

(3) The State in whose territory the emergency originates is required under paragraph 2, subparagraph (a), to notify, “without delay and by the most expeditious means available”, other potentially affected States and competent international organizations of the emergency. A similar obligation is contained, for example, in the 1986 Convention on Early Notification of a Nuclear Accident,⁷⁰ the 1982 United Nations Convention on the Law of the Sea⁷¹ and a number of agreements concerning transboundary aquifers. “Without delay” means 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. The States to be notified are not confined to aquifer States, since non-aquifer States may also be affected by an emergency. The subparagraph also calls for the notification of “competent international organizations”. Such an organization would have to be competent to participate in responding to the emergency by virtue of its constituent instrument. Most frequently, such an organization would be one established by the aquifer States to deal, *inter alia*, with emergencies. The question of compensation is not addressed nor implied at all by the present draft articles. While there may well be no liability on the part of a State for the harmful effects in another State of an emergency originating in the former and resulting entirely from natural causes, the obligations under paragraph 2, subparagraphs (a) and (b), would nonetheless apply to such an emergency.

(4) Paragraph 2, subparagraph (b), requires that a State within whose territory an emergency originated “immediately take all practicable measures ... to prevent, mitigate and eliminate any harmful effects of the emergency”. The effective action to counteract most emergencies resulting from human conduct is that to be taken where the industrial accident, vessel grounding or other incident occurs. However, the paragraph requires only that all “practicable” measures be taken, meaning those that are feasible, workable and reasonable. Further, only such measures as are “necessitated by the circumstances” need to be taken, meaning those that are warranted by the factual situation of the emergency and its possible effect upon other States. The obligation of the States concerned is that of conduct and not result. Like paragraph 2, subparagraph (a), paragraph 2, subparagraph (b) foresees the possibility that there will be a competent international organization, such as a joint commission, with which the States may cooperate in taking the requisite measures. Cooperation with potentially affected States (including non-aquifer States) is also provided for. Such cooperation may be especially appropriate in the case of contiguous aquifers or aquifer systems or where a potentially affected State is in a position to provide cooperation in the territory of the aquifer State where the emergency originated.

(5) UNESCO-IHP has a project entitled “Groundwater for Emergency Situations”, the aim of which is to consider natural and human-induced catastrophic events that could adversely influence human health and life and to identify in advance potential safe, low vulnerability groundwater resources that could temporarily replace damaged supply systems. Secure drinking water for endangered populations is one of the highest priorities during and immediately after disasters.

(6) The obligation of immediate notification to other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States is suggested in Principle 18 of the Rio Declaration.⁷² Several regional conventions provide for the obligation of notification without delay of the potentially affected States, regional commission or

⁷⁰ Art. 2 (Notification and information).

⁷¹ Art. 198 (Notification of imminent or actual damage).

⁷² See footnote 30 above.

agency and other competent organizations. These include, for example, the 2000 Revised Protocol on Shared Watercourses in the Southern African Development Community, the 2002 Tripartite Interim Agreement Between the Republic of Mozambique, the Republic of South Africa and the Kingdom of Swaziland for Co-operation on the Protection and Sustainable Utilisation of the Water Resources of the Incomati and Maputo Watercourses, the 2003 Convention on the sustainable management of Lake Tanganyika and the 2003 Protocol for Sustainable Development of Lake Victoria Basin. The 2003 African Convention on the Conservation of Nature and Natural Resources sets out the right of the State party to be provided with all relevant available data by the other party in whose territory an environmental emergency or natural disaster occurs and is likely to affect the natural resources of the former State.

(7) Some of the conventions have established mechanisms or systems for the early notification of emergency situations. The 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes provides that “[t]he Riparian Parties shall without delay inform each other about any critical situation that may have transboundary impact” (art. 14) and provides for the obligation to set up, where appropriate, and to operate coordinated or joint communication, warning and alarm systems. The 1994 Convention on cooperation for the protection and sustainable use of the river Danube establishes “coordinated or joint communication, warning and alarm systems” (art. 16) and provides for the obligation to consult on ways and means of harmonizing domestic communication, warning and alarm systems and emergency plans. The 1998 Agreement on cooperation for the protection and sustainable use of the waters of the Spanish–Portuguese hydrographic basins⁷³ provides for the obligation of the parties to establish or improve joint or coordinated communication systems to transmit early warning or emergency information.

(8) Paragraph 3 provides for exceptions to the obligations under draft articles 4 and 6 in an emergency. Aquifer States may temporarily derogate from the obligations under those draft articles where water is critical for the population to alleviate an emergency situation. Although the 1997 Watercourses Convention does not contain such a clause, in the case of aquifers, special account should be taken in an emergency situation of vital human needs. For example, in the case of natural disasters, such as earthquakes or floods, an aquifer State must immediately satisfy the need of its population for drinking water. In the case of watercourses, the States could meet such a requirement without derogation from the obligations as the recharge of the water to the watercourses would be likely to be sufficient. However, in the case of aquifers, the States concerned would not be able to do so as there would be no or little recharge. Accordingly, the States must be entitled to exploit the aquifer temporarily without fulfilling the obligations under draft articles 4 and 6. It must be stressed that the draft article relates only to the temporary derogation. There might be cases where the States would not be able to fulfil the obligations in other draft articles also in an emergency. In such a case, the

States could invoke circumstances precluding wrongfulness in general international law such as *force majeure*, distress or necessity.

(9) Paragraph 4 sets forth an obligation of assistance for all the States regardless of whether they are experiencing in any way the serious harm arising from an emergency. Groundwater scientists and administrators are unanimous in recognizing the need for joint efforts by all the States to cope effectively with an emergency. Assistance required would relate to coordination of emergency actions and communication, providing trained emergency response personnel, response equipment and supplies, extending scientific and technical expertise and humanitarian assistance.

Article 18. Protection in time of armed conflict

Transboundary aquifers or aquifer systems and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and non-international armed conflicts and shall not be used in violation of those principles and rules.

Commentary

(1) Draft article 18 concerns the protection to be accorded to transboundary aquifers and related installations in time of armed conflict. The 1997 Watercourses Convention contains an article regarding the same subject and the basic idea of the present article is the same. This draft article, which is without prejudice to existing law, does not lay down any new rule. The principal function of the draft article is to serve as a reminder to all the States of the applicability of the law of armed conflict to transboundary aquifers; principles and rules of international law applicable in international and internal armed conflict contain important provisions concerning water resources and related works. These provisions fall generally into two categories: those concerning the protection of water resources and related works, and those dealing with the utilization of such water resources and works. Since detailed regulation of this subject matter would be beyond the scope of a framework instrument, draft article 18 does no more than to refer to each of these categories of principles and rules.

(2) Draft article 18 is not addressed only to aquifer States, in view of the fact that transboundary aquifers and related works may be utilized or attacked in time of armed conflict by non-aquifer States as well.

(3) The obligation of the aquifer States to protect and utilize transboundary aquifers and related works in accordance with the present draft articles should remain in effect even during the time of armed conflict. Warfare may, however, affect transboundary aquifers as well as the protection and utilization thereof by aquifer States. In such cases, draft article 18 makes it clear that the rules and principles governing armed conflict apply, including various provisions of conventions on international humanitarian law to the extent that the States in question are bound by them. For example, the poisoning of water supplies is prohibited by the Hague Conventions

⁷³ See footnote 51 above.

respecting the Laws and Customs of Land Warfare (1907) and article 54 of the Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I), while article 56 of that Protocol protects dams, dykes and other works from attacks that “may cause the release of dangerous forces and consequent severe losses among the civilian population”. Similar protections apply in non-international armed conflicts under articles 14 and 15 of the Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of non-international armed conflicts (Protocol II). Also relevant to the protection of water resources in time of armed conflict is the provision of Protocol I that “[c]are shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage” (art. 55). In cases not covered by a specific rule, certain fundamental protections are afforded by the “Martens clause”. That clause, which was originally inserted in the preamble of the Hague Conventions respecting the Laws and Customs of War on Land of 1899 and 1907 and has subsequently been included in a number of conventions and protocols, now has the status of general international law. In essence, it provides that even in cases not covered by specific international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established custom, the principles of humanity and the dictates of public conscience. Paragraph 2 of draft article 5 of the present draft articles provides that, in reconciling a conflict between utilizations of transboundary aquifers, special attention is to be paid to the requirement of vital human needs.

Article 19. Data and information vital to national defence or security

Nothing in the present draft articles obliges a State to provide data or information vital to its national

defence or security. Nevertheless, that State shall cooperate in good faith with other States with a view to providing as much information as possible under the circumstances.

Commentary

(1) Draft article 19 creates a very narrow exception to the draft articles requiring provision of information. The same rule is in the 1997 Watercourses Convention. During the first reading, the focus was placed on the confidentiality aspects by using the word “essential” to qualify the confidentiality of such data and information, rather than on whether such data and information was vital to national defence or security, without meaning to change the substance of the text. On further review during the second reading, the Commission decided that there was no compelling reason to deviate from the language of the 1997 Watercourses Convention.

(2) States cannot be realistically expected to agree to the release of information that is vital to their national defence or security. At the same time, however, an aquifer State that may experience adverse effects of planned measures should not be left entirely without information concerning those possible effects. Draft article 19 therefore requires the State withholding information to “cooperate in good faith with the other States with a view to providing as much information as possible under the circumstances”. The exception created by draft article 19 does not affect the obligations that do not relate to the transmission of data and information.

(3) The question of the protection of industrial and commercial secrets, intellectual property rights, the right to privacy and important cultural or natural treasures were considered. It was understood that sharing of data and information required by the present draft articles could well be carried out without infringing those rights.