[H]ECOSYSTEM APPROACH TO ENVIRONMENTAL PROTECTION IN THE LAW OF INTERNATIONAL WATERCOURSES

Yrd. Doç. Dr. Mete ERDEM[*]

Introduction

Living organisms are an indispensable part of the natural habitat of watercourses and highly susceptible to the cause-effect relationship in the water cycle. The natural interconnection and interaction between living organisms and the watercourse environment calls for ecology to be incorporated into the system approach to international rivers so as to "provide the holistic management necessary for sustaining resources in a complex ecological/political landscape."[1] This approach shifts the legal focus from the physical reach of the river's aquatic environment onto the biological components of a watershed. The geographical scope of international watercourses, therefore, does not extend so far as to include all natural forms of water in the hydrological cycle but remains within the confines of a self-contained hydrosystem. The legal emphasis is, rather, placed on the notion of ecology for an integrated environmental protection of

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* Erciyes University Faculty of Law

1 Grumbine R.D., "What is Ecosystem Management?" (1994) 8:1 *Conservation Biology*, p.28; in reference to an example of the ecosystem management of the Greater Yellowstone region in the United States, also see Olheiser S. J., "Cooperative Ecosystem Management: Can an Ecosystem Approach Succeed in Wyoming?" (1997) 32:2 *Land and Water Law Review*, pp.638-42.

the watercourse system. In this context, the ecosystem approach aims to bring ecological considerations into the domain of law.[2]

Scientific Conceptualisation of Ecosystems

By definition, ecology, as a distinct field of biology, is "the scientific study of the interactions that determine the distribution and abundance of organisms" which live in a matrix of space and time.[3] In general, as the study of the structure and function of nature of which mankind is a part, Odum defines ecology in terms of the biology of groups of living organisms, their relation to the physical environment they inhabit and functional processes, *inter alia*, in freshwater.[4] The initial conceptual understanding of ecosystem was proposed by Tansley as the basic unit of ecology, comprising the biotic community and its abiotic (non-living) environment at the level of integration and interaction.[5] It is also a systematic level of organisation, which allows the holistic view of ecology to be analysed as complete

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2 Some suggest "ecosystemic laws", see Brooks R.O., Jones R. & Virginia R.A., *Law and Ecology: The Rise of the Ecosystem Regime*, (Hants, UK: Ashgate Publishing, 2002), pp.2ff; Sprout H. & Sprout M., "The Ecological Viewpoint-and Others" in *The Future of the International Legal Order, Vol.IV: The Structure of the International Environment*, Edited by Black C.E. & Falk R.A., (New Jersey: Princeton Uni. Press, 1972), pp.569 *et seq*.; Bosselman F.P. & Tarlock A.D., "The Influence of Ecological Science on American Law: An Introduction" in *Symposium on Ecology and the Law*, (1994) 69:4 *Chicago-Kent Law Review*, pp.847 *et seq*.; also see, Tarlock A.D., "The Nonequilibrium Paradigm in Ecology and the Partial Unravelling of Environmental Law", (1994) 27:3 *Loyola of Los Angeles Law Review*, pp.1121 *et seq*.

3 Krebs C.J., *Ecology: The Experimental Analysis of Distribution and Abundance*, Fifth Edition (San Francisco: Benjamin Cummings, 2001), p.2.

4 Odum E.P., *Fundamentals of Ecology*, Third Edition (Philadelphia: Sounders Coll., 1971), p.3.

5 The term, ecosystem was introduced by botanist Sir Arthur G. Tansley in his seminal work, "The Use and Abuse of Vegetational Concepts and Terms", (1935) 16 *Ecology*, pp.284-307, at p.299; For its conceptual development see, Major J., "Historical Development of the Ecosystem Concept" in *The Ecosystem Concept in Natural Resource Management*, Edited by G.M. Van Dyne (New York: Academic Press, 1969), pp.9-22.

systems rather than their abstract parts.[6] Much of modern ecology is, however, shaped by reductionism that views ecosystems as natural assemblages in the form of a functional, coordinated unit with, in Ricklefs & Miller's words, "a new appreciation of the importance of scale, both as a characteristic of ecosystems and as a determinant of ecosystem processes; of the dynamics of how different ecosystems, such as, for example, a lake and the surrounding forest, interact at their boundaries; and of how patterns of species abundance and distribution relate to ecosystem function".[7] Used as a technical application of the holistic, materialistic worldview to describe ecological structures and functions,[8] the core concept *system* is a physical one, denoting a complex, in which regularly interacting and independent parts form a unified whole in a given area;[9] so too is Tansley's ecosystem concept that "both the physical-chemical environment and biotic organisms act together to form an ecosystem" as part of a continuum of physical systems in nature, driven by equilibrium and stability as guiding principles of ecosystem organisation and maintenance.[10]

By the same token, freshwater ecosystems, just as other natural assemblages, are part of a hierarchy of physical systems in their wholeness at

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6 The argument between holism and reductionism is a pertinent one, see Golley F.B., *A History of the Ecosystem Concept in Ecology: More than the Sum of the Parts* (New Haven: Yale University Press, 1993), pp.25f and 28f.

7 Ricklefs R.E. & Miller G.L., *Ecology*, Fourth Edition (New York: W.H. Freeman & Co., 2000), p.174.

8 For a brief survey of ecological structures and functions, see White J.W. & Preston K.P., "Ecological Systems" in *Ecology, Law and Economics: the Simple Analytics of Natural Resource and Environmental Economics*, Edited by N. Mercuro, Second Ed., (Lanham, Maryland: University Press of America, 1977), pp.38 *et seq*.

9 Blair J.M., Collins S.L. & Knapp A.K., "Ecosystems as Functional Units in Nature", (2000) 14:3 *Natural Resources & Environment*, p.151.

10 Golley (1993), *A History of the Ecosystem Concept*, pp.16, 34 and 46f.; However, the concept of physical equilibrium has recently faced a stiff challenge and is claimed to be replaced with a contemporary equilibrium paradigm, recognising that ecosystems are open and subject to a wide range of disturbances changing succession patterns and affecting the distribution and abundance of species. See, Meyer J.L., "The Dance of Nature: New Concepts in Ecology", (1994) 69:4 *Chicago-Kent Law Review*, pp.875 *et seq*.

the level of biological organisation with the functional unity of organisms and environment in their definable boundaries that delimit them from their surroundings, making it all suitably viable for the application of system analysis techniques.[11] Ironically, it is the extreme complexity of the holistic view of ecology that necessitates a conceptual reduction to well-delineated functioning units, manageable for ecosystem research as a field study.[12] For that reason, watercourses and lakes can offer a relatively well-defined and discrete areal unity with clear boundaries to form a descriptive base for a functionally, structurally integrated system approach to the observation and control of physical-chemical-biological processes.[13] In the United States of America, the experimental study of the Hubbard Brook example showed that watershed studies, where "the hydrologic divide defined the limits of the system in a natural way" offered a better practical success in understanding ecosystem functions and processes closely linked to the hydrological cycle

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11 Odum (1971), *Fundamentals of Ecology*, pp.295 *et seq*.; Dodds W.K., *Freshwater Ecology: Concepts and Environmental Application*, (San Diego: Academic Press, 2002), pp.449 *et seq*.; Angelier E., *Ecology of Streams and Rivers*, English Translation by J. Munnick, (Enfield, New Hampshire: Science Publ. Inc., 2003), pp.21 *et seq*.

12 Brooks, Jones & Virginia (2002), *Law and Ecology*, pp.11f.

13 The first successful implementation of Tansley's ecosystem was Raymond Laurel Lindeman's (1915-1942) ground-breaking doctoral work on "Seasonal Food Dynamics in a Senescent Lake", Cedar Creek Bog near the University of Minnesota in 1941. His subsequent article, entitled "The Trophic-Dynamic Aspect of Ecology" (1942) 23:4 *Ecology*, pp.399-418, is a compelling study of nature being organised into ecological systems including lakes or watersheds as the fundamental unit of trophic-dynamics, a network of feeding relationships (food cycle) among their species populations linked through the flows of energy, which have an origin and development (succession) leading to a steady state or dynamic equilibrium. In short, Lindeman laid the scientific descriptive background in a modern sense for the ecosystem approach to international watercourses for what is worth today. See Golley (1993), *A History of the Ecosystem Concept*, pp.48-60; Also see Cook R.E., "Raymond Lindeman and the Trophic-Dynamic Concept in Ecology", (1977) 198 *Science*, pp.22-6 and Reif C.F., "Memories of Raymond Laurel Lindeman", (1986) 67:1 *Bulletin of Ecological Society of America*, pp.20-5.

within the holistic context,[14] thereby paving the way for the ecosystem management approach to both national and international river basins.[15]

Transposition of the Ecosystem Approach into the International Law Context[16]

In international law, as an extension of the regional holistic management movement for effective environmental protection, the rise of the ecosystem approach to shared natural resources appears to have gradually revolved, *inter alia*, around the use and development of international rivers and lakes, because they can be demarcated by discernable topographical features of relatively self-contained, integrated natural watershed systems in a common hydrologic catchment basin crossing jurisdictional boundaries.[17] The ecosystem approach to international watercourses has received a wide acceptance due to the recognition that "the sheer scale of the current human assault on freshwater ecosystems" is

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14 Golley (1993), *idem*, pp.143-51; Blair *et al*. (2000), *Ecosystems*, p.151.

15 Francis G., "Ecosystem Management", (1993) 33:2 *Natural Resources Journal*, pp.326 *et seq*.; for other American examples see Olheiser (1997), "Cooperative Ecosystem", pp.638 *et seq*.

16 For an excellent account of "ecosystems" in international environmental law see Dan Tarlock, "Ecosystems" in *The Oxford Handbook of International Environmental Law*, Edited by D. Bodansky, J. Brunnée & E. Hey (Oxford; Oxford University Press, 2007) pp.574-96

17 Cf. Nanda conversely points to the emergence of the term, ecosystem, from wild life and biodiversity agreements, not in the watercourses context. See Nanda V.P., *International Environmental Law & Policy*, (Ardsley, NY: Transnational Publishers, 1995), p.274; White G.F., "The River as a System: A Geographer's View of Promising Approaches", (1997) 22:2 *Water International*, pp.79ff.; The conceptual emergence of ecological notions goes well beyond the ambit of international watercourses law, cf. Caldwell L.K., "Concepts in Development of International Environmental Policies" in *International Environmental Law*, Edited by L.A. Teclaff & A.E. Utton, (New York: Preager Publ., 1974), pp.12 *et seq*; Brooks, Jones & Virginia (2002), *Law and Ecology*, pp.325 *et seq*.; for a comparable study on Antarctic ecosystem conservation see Redgwell C., "Protection of Ecosystems under International Law: Lessons from Antarctica" in *Protection of Ecosystems under International Law: Lessons from Antarctica*, Edited by Alan E. Boyle & David Freestone, (Oxford: Oxford University Press, 1999), pp.207 *et seq*.

causing an irreversible harm on nature's life support systems with far-reaching adverse implications for human livelihood and survival, no matter whether it arises from self-awareness of a need for comprehensive protective and preventive measures in the industrialised north or from a non-riparian international initiative in the developing south.[18] In all cases, a new, broader ecological view of treating aquatic environmental assets as a whole is called for.

An Agreement of 1978 between Canada and the United States of America on Great Lakes Water Quality was built on the ecosystem approach to attain the purpose of "restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Great Lakes Basin Ecosystem",[19] which the 1972 Agreement's water quality objectives approach previously failed to do alone.[20] Remarkably, under the 1978 Agreement, the

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18 Quoted from Abramovitz J.N., *Imperilled Waters, Impoverished Future: The Decline of Freshwater Ecosystems*, WordWatch Paper 128, (WorldWatch Institute, 1996), pp.8f; Postel S., *The Last Oasis: Facing Water Scarcity*, (London: Worldwatch/Earthscan Publications Ltd., 1992) pp.48-72; Newson M., *Land, Water and Development: River Basin Systems and their Sustainable Management*, (London: Routledge, 1992), pp.88 *et seq*.

19 Text reproduced in Molitor M.R., *International Environmental Law: Primary Materials*, (Deventer: Kluwer Law, 1991), pp.117 et seq.; Utton A.E., "Canadian International Waters" in *Waters and Water Rights*, Volume 5, 1991 Edition, Edited by R.E. Beck, (Charlottesville: The Michie Co., 1991), pp.89 *et seq*.; Christie W.J., "The Ecosystem Approach to Managing the Great Lakes: The New Ideas and Problems Associated with Implementing Them", (1995) 26:2 *University of Toledo Law Review*, pp.279 *et seq*.; Williams S.A., "Public International Law and Water Quantity Management in A Common Drainage Basin: The Great Lakes", (1986) 18:1 *Case Western Reserve Journal of International Law*, p.184.

20 Agreement of 15 April 1972 between Canada and the USA on Great Lakes Water Quality, (1972) 11 *International Law Materials*, p.694; for a detailed examination see Moseley F.E., *The United States-Canadian Great Lakes Pollution Agreement: A Study in International Water Pollution Control*, Unpublished PhD Dissertation, Kent State University, June 1978 *passim*. (on file with author); Bourne C.B., "Legal Aspects of Transfrontier Pollution: Canada-United States Experience", (1981) 28 *Netherlands International Law Review*, pp.190f.; cf. Pratt G.E., "Pollution of the Great Lakes: A Joint Approach by Canada and the United States", (1971) 2 *California Western International Law Journal*, pp.109 *et seq*.; cf. Piper D.C., *The International Law of the*

conceptualisation of the ecosystem approach has been an institutionalised process dynamic in character, being left to the contracting parties to develop and interpret the necessary ways and means in their periodical reviews and assessments to implement the integration of adaptive environmental policies on the basis of on-going research and monitoring.[21]

A comparable attempt of an ecology-oriented multilateral treaty regime in Western Europe is the 1999 Bern Convention on the Protection of the Rhine which seeks to conserve and improve the Rhine ecosystem by taking a comprehensive approach to the sustainable development of the Rhine catchment area including the aquatic and terrestrial ecosystems as well as the Rhine river, its banks, alluvial areas, and interacting groundwater resources.[22] This sudden shift towards the recognition of the necessity of

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Great Lakes: A Study of Canadian-United States Cooperation, (Durham, NC: Duke Uni. Press, 1967), pp.8 *et seq*.

21 Birnie P., Boyle A. & Redgwell C., *International Law & the Environment*, Third Edition (Oxford: Oxford University Press, 2009), p.578; Allen T.F.H., Bandurski B.L. & King A.W., *The Ecosystem Approach: Theory and Ecosystem Integrity*, Report to the Great Lakes Science Advisory Board, (Canada: International Joint Commission, 1993); *Practical Steps to Implement An Ecosystem Approach in Great Lakes Management*, Co-sponsored by US Environmental Protection Agency and Environment Canada in cooperation with the International Joint Commission and Wayne State University, (Detroit: 1995) at www.ijc.org; Dworsky L.B., Utton A.E. & Allee D.J., "The Great Lakes: Transboundary Issues for the Mid-90s', (1995) 26:2 *University of Toledo Law Review*, pp.367-80; Caldwell L.K., "Emerging Boundary Environmental Challenges and Institutional Issues: Canada and the United States", (1993) 33:1 *Natural Resources Journal*, pp.14 et seq.; especially for the 1987 Protocol to the 1978 Agreement see Lemarquand D., "The International Joint Commission and Changing Canada-United States Boundary Relations", (1993) 33:1 *Natural Resources Journal*, pp.70 ff.; Francis (1993), "Ecosystem Management", pp.332-40; Dworsky L.B., "Ecosystem Management: Great Lakes Perspectives", (1993) 33:2 *Natural Resources Journal*, pp.349-58; Roben B.B., "International Freshwaters" in *International, Regional and National Environmental Law*, Edited by F.L. Morrison & R. Wolfrum, (The Hague: Kluwer Law International, 2000), pp.317ff.

22 Convention between Germany, France, Luxembourg, the Netherlands, Switzerland and the EU on the protection of the Rhine, done in Bern on 12 April 1999 and came into force on 1 January 2003, (1998) 9 *Yearbook of International Environmental Law*, p.194, reproduced at www.iksr.org/icpr

holistic approach, interlocking and integration of water pollution control measures for protection and improvement of the Rhine ecosystem and groundwater[23] was in most part prompted by an ecological devastation. A toxic chemical spill into the Rhine was caused by the Sandoz fire accident that occurred near Basel, Switzerland in 1986,[24] revealing the inadequacy of the treaty regime, set out by the 1963 and 1976 Rhine Conventions,[25] in providing protection against pollution.[26] However, much of the success in achieving, what Nollkaemper calls, a recent "legal transformation from the old principle of equal apportionment to a new ecosystem-paradigm"[27] laid in the pre-existing institutional mechanism under these conventions, coupled with the European Union's contribution to a co-operative setting for legal formation partly organisational and partly substantial in character.[28] The

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23 Communiqué of the Ministerial Declaration on the 11th Conference of Ministers on the Protection of the Rhine, (Berne: 8 December 1994) and Communiqué of the Ministerial Declaration on the 12th Conference of Ministers on the Protection of the Rhine, (Rotterdam: 22 January 1998), texts reproduced on www.iksr.org.

24 For a detailed examination of the Sandoz accident and its legal consequences see Schwabach A., "The Sandoz Spill: The Failure of International Law to Protect the Rhine from Pollution", (1989) 16:2 *Ecology Law Quarterly*, pp.443 *et seq*; and for the ensuing liability issues see, Rest A., "The Sandoz Conflagration and the Rhine Problem: Liability Issues", (1987) 30 *German Yearbook of International Law*, pp.160 *et seq*.

25 Agreement concerning the International Commission for the Protection of the Rhine against Pollution, done in Berne on 29 April 1963 and Convention for the Protection of the Rhine against Chemical Pollution, adopted at Bonn on 3 December 1976, reproduced respectively in Kiss A.C. (Ed.), *Selective Multilateral Treaties in the Field of the Environment*, UNEP Reference Series 3, (Nairobi: Prudential Printers, 1983), pp.176 and 468.

26 Kiss A.C., "The Protection of the Rhine against Pollution", (1985) 25:3 *Natural Resources Journal*, pp.613 *et seq*.; De Villeneuve C.H.V., 'Western Europe's Artery: The Rhine', (1996) 36:3 *Natural Resources Journal*, pp.451ff.

27 Nollkaemper's use of the principle of equal apportionment is to be understood as an equal right to equitable utilisation. Nollkaemper A., "The River Rhine: From Equal Apportionment to Ecosystem Protection", (1996) 5:2 *Review of European Community and International Environmental Law*, p.152.

28 Bothe M., "Freshwater Management in Europe – International Legal Issues" in *(1989) Canadian Council of International Law: Proceedings of the 18th Annual Conference on Preserving the Global Environment*, (Ottawa: CCIL, 1989), p.405; Meinhard Shroder,

advanced level of institutionalised cooperation among the co-riparian states facilitated a rapid response under public pressure to the Sandoz spill by adopting a "Rhine Action Programme" (RAP), with ambitious targets for the improvement of the Rhine ecosystem beyond water quality objectives in 1987 and only to be extended to the ecology of the North Sea a year later.[29] Hence, not only has the 1999 Rhine Convention translated the non-binding commitments to the sustainable development of the Rhine ecosystem with the holistic approach into binding treaty obligations,[30] but also the breadth of its geographical scope is such that the regional management of the Rhine and the marine environment can now be more effectively integrated in holistic terms, thereby making a close coordination between the Rhine Commission and -the Paris Commission and the International North Sea Conference all but more possible.[31]

Although less explicit, a similar trend towards the ecosystem approach can be observed in the making of recent multilateral treaty regimes governing other European rivers such as the Danube, the Elbe, the Scheldt

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"The Rhine" in Kiss A. & Shelton D., *Manual of European Environmental Law*, (Cambridge: Grotius Publ., 1993) pp.255ff; cf. European Union, *The Water Framework Directive: Tap into it!*, Directorate-General Environment, (Belgium: EU Official Publications, 2002); Urban D., "European Union Framework Directive", (2000) *Yearbook of Colorado Journal of Environmental Law & Policy*, pp.193 *et seq*. and also see Rieu-Clarke A.S., "Sustainable Use and the EU Water Framework Directive: From Principle to Practice", paper presented at *Sustainable Development and International Law Seminar*, held at the University of Amsterdam, 30 November - 2 December 2001, at www.dundee.ac.uk/law/iwlri/index.php.

29 Nollkaemper A., "The Rhine Action Programme: A Turning Point in the Protection of the North Sea?" (1990) 5 *International Journal of Estuarine and Coastal Law*, pp.123; Wieriks K. & Schulte-Wulwer-Leidig A., "Integrated Water Management for the Rhine River Basin, from Pollution Prevention to Ecosystem Improvement", (1997) 21:2 *Natural Resources Forum*, pp.151 *et seq*.

30 The ICPR Program for the Sustainable Development of the Rhine, "Rhine 2020" Report No.116, Communiqué of the Ministerial Declaration on the 13th Conference of Ministers on the Protection of the Rhine, (Strasbourg: 29 January 2001), reproduced on www.iksr.org.; Sands P. & Peel J., *Principles of International Environmental Law*, Third Edition (Cambridge: Cambridge University Press, 2012) p.322.

31 Birnie, Boyle & Redgwell (2009), *International Law*, p.576.

and the Meuse. Like the new Rhine regime, they all are, to various degrees, modelled on the guiding principles of the 1992 UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Rivers,[32] with the regional initiatives of the European Union, one way or another linking them to the ecology of the surrounding seas on the basis of its 2000 Water Framework Directive.[33] After years of fragmented, sectoral and mostly bilateral cooperation between politically separated the East and the West for navigational and non-navigational uses away from environmental concerns,[34] eleven Danubian states together with the European Union concluded a Convention on Cooperation for the Protection and Sustainable Use of the Danube River in 1994, which not only applied to the "catchment area" defined as the Danube's hydrological river basin, but also involved all human activities causing transboundary impacts on the aquatic ecosystems in that catchment area.[35] In fact, it remains among the objectives of cooperation between the riparian states through the establishment of a new international Commission to avoid lasting environmental damage and protect ecosystems and even more, to ensure the conservation and restoration of ecosystems as part of sustainable

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32 (1992) 31 *International Legal Materials*, p.1312: Bosnjakovic B., "UN/ECE Strategies for Protecting the Environment with Respect to International Watercourses: The Helsinki and Espoo Conventions" in *International Watercourses: Enhancing Cooperation and Managing Conflict*, Proceedings of a World Bank Seminar, Edited by S.M.A. Salman & L.B. de Chazournes, World Bank Technical Paper No.414, (Washington, DC: World Bank, 1998), pp.50 *et seq*.

33 European Environment Agency, *Europe's Environment: the third assessment*, Environmental Assessment Report No.10, (Copenhagen: EU Official Publications Office, 2003), pp.195f.

34 For criticism of a piece-meal approach to long neglected environmental issues see Linnerrooth J., "The Danube River Basin: Negotiating Settlements to Transboundary Environmental Issues", (1990) 30:3 *Natural Resources Journal*, pp.629 *et seq*.; for sectoral studies, e.g. Bruhacs J., *The Law of Non-Navigational Uses of International Watercourses*, (Dordrecht: Martinus Nijhoff, 1993), pp.88 *et seq*.; Bogdanovic S., "Legal Aspects of Danube Waters Protection", (1993) 35:3-4 *Acta Juridica Hungarica*, pp.321 *et seq*.

35 Article 1(a) and (c), Convention on Cooperation for the Protection and Sustainable Use of the Danube River, signed in Sofia on 29 June 1994, reproduced on www.icpdr.org.

development and environmental protection of the Danube river.[36] Furthermore, the imposition of an obligation to "endeavour to contribute to reducing the pollution loads of the Black Sea" from sources in the Danube catchment area with clear reference to the 1992 Black Sea Convention in the preamble[37] has allowed this "hydrographic basin convention" to take a holistic, integrated approach to the marine ecosystem protection against land-based pollution as a common strategic goal to be implemented by an inter-regional cooperation between the Danube and Black Sea Commissions.[38]

Nevertheless, one cannot fail to note, with some caution, the European Union's influence on the guiding policy of the Convention and its institutions, driven by the notion of "building western alliances in the region and eventually integrating the former socialist countries into the European Union", described by Linnerooth-Bayer & Murcott as "a powerful *raison d'être* for the West to establish a cooperative regime for promoting sustainable environmental policies in the region."[39] Such influence is also evident in the 1990 Convention between Germany, the Czech and Slovak Federal Republic and the European Economic Community on the International Commission for the Protection of the Elbe, which requires them "to prevent the pollution of the Elbe and its drainage area" by trying, *inter alia*, "to achieve as natural an ecosystem as possible with a healthy diversity of species and to reduce substantially the pollution of the North Sea (and its natural aquatic communities) from the Elbe area".[40] Comparably, an

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36 Article 2(3) and (5) of the 1994 Danube River Protection Convention.

37 Preamble and Article 2(1) of the 1994 Danube River Protection Convention.

38 Memorandum of Understanding between the International Commission for the Protection of the Black Sea (ICPBS) and the International Commission for the Protection of the Danube River (ICPDR) on Common Strategic Goals, signed in Brussels on 26 November 2001, reproduced on www.icpdr.org.

39 Linnerooth-Bayer J. & Murcott S., "The Danube River Basin: International Cooperation or Sustainable Development", (1996) 36:3 *Natural Resources Journal*, pp.522 and 544.

40 Article 1(1), (2b)&(2c) and 2(1c), Convention between the Federal Republic of Germany, the Czech and Slovak Federal Republic and the European Economic Community on the International Commission for the Protection of the Elbe, done at Magdeburg on 8 October 1990, reproduced in Burchi S., *Treaties concerning the Non-*

obscure obligation incumbent upon the riparians of the Rivers Scheldt and Meuse in the 1994 Agreements to protect and improve the quality of their aquatic system[41] takes a somewhat weaker form of the ecosystem approach as applied to the European rivers such as the Rhine and the Danube, while leaving much about its interpretation and implementation to the competence of the international commissions at the discretion of the contracting parties, who are required to work towards integrated management and sustainable development of the respective drainage basins.[42]

All in all, the legal manifestation of ecosystem protection beyond narrow traditional measures against water pollution in North American and European treaty practice needs to be viewed in a broad sense of environmental policy initiatives, whose implementation calls for institutionalised regional cooperation mostly within the framework of a supranational organisation e.g. the European Union[43] or of a regional treaty

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navigational Uses of International Watercourses – Europe, FAO Legislative Study 50, (Rome: FAO, 1993), p.40; also see, Schumann A.H. & Simon M., "A Transboundary water Management Organization: The International Commission for the Protection of the Elbe River" in *Transboundary Water Resources Management: Institutional and Engineering Approaches*, Edited by J. Ganoulis *et al*., (Berlin: Springer, 1996), pp.47 *et seq*.

41 Article 3(6), Separate Agreements between France, the Netherlands, the Wallon Region, the Flemmish Region, and the Brussels-Capital Region on the Protection of the Rivers Scheldth and Meuse, signed at Charleville-Mezierez, France on 26 April 1994, (1995) 34 *International Law Materials*, pp.851 *et seq*.

42 Gosseries A., "The 1994 Agreements Concerning the Protection of the Scheldt and Meuse Rivers". (1995) 4:1 *European Environmental Law Review*, p.11; Bouman N., "A New Regime for the Meuse", (1996) 5:2 *Review of European Community and International Environmental Law*, pp.162f; Maes F., "The Content of the Agreements on the Protection of the Rivers Scheldt and Meuse", (1997) 30 *Revue Belge de Droit International,* pp.668f.

43 The EU 2000 Directive Establishing a Framework for the Community Action in the Field of Water Policy purports to "organise previously disparate or conflicting policies on the same body of water into coordinated management plans" by imposing on member states an obligation to set up a common river basin management plan with measures to ensure that the objectives of the Directive will be met within the deadline of fifteen years. Urban (2000), "European Union Framework Directive", p.195.

regime e.g. the NAFTA and the environmental side agreement NAAEC[44] on the one hand, and aims to incorporate with the protection of marine ecosystems as part of an integrated resource management on the other.[45] And yet, neither aspect has been sufficiently established in state practice to merit a significant global support in international environmental law, except perhaps for some limited institutional arrangements at the riparian level exclusive to certain river basins.

Such analogous examples may be drawn from recent Asian and African multilateral treaty practice which has, on equal measure, geared towards the sustainable development and integrated management of regional rivers with ecosystem orientation. One of the key objectives of an Agreement of 1995 on the Cooperation for the Sustainable Development of the Mekong River Basin is to "protect the environment, natural resources, aquatic life and

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44 North American Free Trade Agreement between Canada, Mexico and the United States, done at Washington, Ottawa and Mexico City on 8, 11, 14 and 17 December 1992, (1993) 32 *ILM*, pp.289 *et seq*.; North American Agreement on Environmental Cooperation between Canada, Mexico and the United States, done at Washington, Ottawa and Mexico City on 8, 9, 12, and 14 December 1993, (1993) 32 *ILM*, pp.1480 *et seq*.; Saunders J.O., "NAFTA and the North American Agreement on Environmental Cooperation: A New Model for International Collaboration on Trade and the Environmental", (1994) 5:2 *Colorado Journal of International Environmental Law & Policy*, pp.273 *et seq*.; Dimento J.F. & Doughman P.M., "Soft Teeth in Back of the Mouth: The NAFTA Environmental Side Agreement Implemented", (1998) 10:3 *Georgetown International Environmental Law Review*, pp.641 *et seq*.; Szekely A., "Establishing a Region for Ecological Cooperation in North America", (1992) 32:3 *Natural Resources Journal*, pp.563 *et seq*.

45 In this sense, an expansive approach to regionalism in international watercourses law to integrate in efforts to combat marine pollution and protect marine ecosystems against land-based sources would not contradict an intended global framework of regulation for the protection of the marine environment under Part XII of the 1982 UN Law of the Sea Convention but in fact, should be considered "necessary or more appropriate even within a broadly uniform and comprehensive global legal order". See Boyle A, "Globalism and Regionalism in the Protection if the Marine Environment" in *Protecting the Polar Marine Environment: Law and Policy for Pollution Prevention*, Edited by D. Vidas (Cambridge: Cambridge University Press, 2000), pp.23ff.; Also see, Teclaff L.A. & Teclaff E., "Transfers of Pollution and the Marine Environment Conventions", (1991) 31:1 *Natural Resources Journal*, pp.201 *et seq*.

conditions and ecological balance of the Mekong River Basin" within an institutional framework for cooperation.[46] Moreover, the ecosystem approach to the sustainable development and use of the Mekong River Basin is translated into a substantive obligation not to cause harm to the environment including the aquatic (ecosystem) conditions and ecological balance of the river system.[47] On the other hand, no obligation of the kind is apparent in modern African treaties, which admittedly take a more sophisticated environmental approach to the basinwide development and use of international freshwater resources, backed by relatively well-advanced institutional structures in most cases. Of particular importance, due to its comprehensive content, is an Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System with a rather ambitious programme for the integration of ecological considerations into the management of water resources through environmental assessment, management and legislation in a complex institutional and financial setting, drawn largely in "a woolly and anticipatory format" rather than a normative specification in obligations.[48] Nonetheless, what is common to the 1995 Mekong Agreement and the 1987 Zambezi River Agreement is the inducement of the basin states, before a real water conflict arose between them, by third party international organisations or donor countries to adopt the ecosystem approach in return for a substantial financial aid and administrative assistance with a view to ameliorating fragmented and unsustainable water projects as a cause of the

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46 Article 3, Agreement between Cambodia, Laos, Thailand and Vietnam on the Cooperation for the Sustainable Development of the Mekong River Basin, done at Chiang Rai, Thailand on 5 April 1995, (1995) 34 *International Law Materials*, p.864;

47 Article 7, *ibid*.; Pitchyakorn B., "Sustainable Development and International Watercourse Agreements: The Mekong and the Rhine", paper dated 30 June 2002 submitted to IUCN, pp.19ff at www.internationalwaterlaw.org, (on file with author)

48 See ZACPRO 6(c) in particular, Agreement between Botswana, Mozambique, Tanzania, Zambia and Zimbabwe on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System, signed at Harare, Zimbabwe on 28 May 1987, (1988) 27 *International Law Materials*, p.1109; Quotation from Okidi C.O., "International Law and Water Scarcity in Africa" in *The Scarcity of Water: Emerging Legal and Policy Response*s, Edited by E.H.P. Brans, E.J. de Haan, A. Nollkaemper & J. Rinzema, (London: Kluwer Law International, 1997), p.175.

regional economic underdevelopment in the South.[49] For that reason, they, too, need to be treated with caution just as those of the recent European watercourse treaties, but unlike the latter, their effectiveness remains questionable because of limited implementation with a lack of adequate human, financial and technical resources.[50]

Conversely, a more realistic expression of the customary position as to the ecosystem approach in international watercourses law, where no such third party influence or institutional pre-setting exists, is the 1978 Treaty for

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[49] For the third party involvement in the Mekong River see the United Nation's ECAFE and then its successor ECAFE with UNDP, UNEP, European donors, Japan and Australia, Browder G. & Ortolano L., "The Evolution of an International Water Resources Management Regime in the Mekong Basin", (2000) 40:3 *Natural Resources Journal*, pp.504-18; Hirsch P., "Beyond Nation State: Natural Resource Conflict and 'National Interest' in Mekong Hydropower Development", (1999) 29:3 *Golden Gate University Law Review*, pp.408-12; Savasdibutr P., "The Development of the Lower Mekong River Basin" in *River and Lake Basin Development*, Proceedings of an Interregional Meeting, held by UN Department of Technical Cooperation for Development (DTCD) and Economic Commission for Africa (ECA) in Addis Ababa, Ethiopia from 10 to 15 October 1988, Natural Resources Water Series No.20, (New York: UN, 1990), pp.172ff.; for a general view of the supranational planning and the multi-donor approach in Africa, see UN Economic Commission for Africa, "Integrated River and Lake Basin Management as a Vehicle for Socio-Economic Development in Africa" in UNDTCD, *River and Lake Basin Development, Proceedings of an Interregional Meeting, Addis Ababa, Ethiopia, 10-15 October 1988*, Natural Resources/Water Series No.20, (New York: UN Publication Sales No.E.90.II.A.10, 1990), pp.59 *et seq*.; UNEP, "The Multi-Donor Approach in Large River and Lake Basin Development in Africa" in UNDTCD (1990), *idem*, pp.74 *et seq*.; also for the World Bank's involvement in African rivers management see, Hirji R. & Grey D., "Managing International Waters in Africa: Process and Progress" in *International Watercourses: Enhancing Cooperation and Managing Conflict, Proceedings of a World Bank Seminar*, Edited by S.M.A. Salman & L. Boisson de Chazournes (Washington, D.C.: The World Bank, 1998), pp.90 *et seq*.

[50] Birnie, Boyle & Redgwell (2009), *International Law*, pp.579-80; Boer B., Ramsay R. & Rothwell D.R., *International Environmental Law in the Asia Pacific*, (London: Kluwer Law International, 1998), p.203; Okaru-Bisan V., "Institutional and Legal Frameworks for Preventing and Resolving Disputes Concerning the Development and Management of Africa's Shared Basins", (1998) 9:2 *Colorado Journal of International Environmental Law & Policy*, pp.342 *et seq*.

Amazonian Cooperation. It alludes to the ecological conservation of the Amazon region by signifying "the need for the exploitation of the flora and fauna of the Amazon region to be rationally planned so as to maintain the ecological balance within the region and preserve the species", nonetheless subject to a right inherent in the sovereignty of the Amazon states to the exclusive use and utilisation of natural resources within their respective territories.[51] In recognition of a necessary balance between economic and social development and environmental conservation, the 1989 Amazon Declaration, however, goes on to reaffirm the sovereign right of each country to manage freely its natural resources, while openly rejecting any attempt made by developed countries to use legitimate ecological concerns over the conservation of the Amazon environment to realise commercial profits.[52]

Further multilateral efforts to promote the progressive development of international law into an ecology-oriented approach to watercourse protection have resulted in three framework agreements, of which the 1997 UN Convention on the Non-Navigational Uses of International Watercourses[53] is of global character, while the other two remain region-specific: the 1992 UNECE Helsinki Convention on the Protection and Use of

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51 Articles 4 and 7, Treaty between Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam and Venezuela for Amazonian Cooperation, signed at Brasillia on 3 July 1978, (1978) 17 *International Law Materials*, p.104; Landau G.D., "The Treaty for Amazonian Cooperation: A Bold New Instrument for Development", (1980) 10:3 *Georgia Journal of International & Comparative Law*, pp.477f.; *Cf*. for the institutional scope of the treaty see, Botto M.P., 'The Amazon Cooperation Treaty: A Mechanism for Cooperation and Sustainable Development" in *Management of Latin American River Basins: Amazon, Plata, and São Francisco*, Edited by A. Biswas *et al*. (Tokyo: United Nations University Press, 1999), pp. 68 et *seq*.; for an examination of the Treaty from the perspective of the Venezuelan-Brazilian relations see Bond R.D., "Venezuela, Brazil and the Amazon Basin", (1978) 22:3 *Orbis*, pp.643-6.

52 Paras. 4 and 8 of The Amazon Declaration, adopted at Manaus, Brazil, on 6 May 1989 by the Presidents of the States Parties to the Treaty for Amazonian Co-operation, (1989) 28 *International Law Materials*, p.1303ff.; Okidi C.O., "'Preservation and Protection' Under the 1991 ILC Draft Articles on the Law of International watercourses", (1992) 3:1 *Colorado Journal of International Environmental Law & Policy*, p.165.

53 (1997) 36 *International Law Materials*, p.700.

Transboundary Watercourses and International Lakes[54] largely in the European context and a Revised Protocol of 7 August 2000 on Shared Watercourses in the South African Development Community (SADC).[55] As seen above, subsequent European treaties follow suit in fulfilling the 1992 Helsinki Convention's requirement, for sustainable water resources management, of the application of the ecosystems approach to the prevention, control and reduction of transboundary impact[56] on the environment including flora, fauna, soil, air, water, climate, landscape and the interaction among these factors.[57] To achieve the aim of ecologically sound and rational water management, conservation of water resources and environmental protection,[58] the use of transboundary waters that the Convention designates as its scope of application may necessarily call for a somewhat broad interpretation of watercourse ecosystems for their conservation or even restoration.[59] The 1997 Helsinki Declaration, adopted at the First Meeting of the Parties to the 1992 UNECE Helsinki Convention following its entry into force, is indicative of the extent to which the management of internal waters is included in the scope of the Convention's application in order to ensure consistency in the protection and use of both internal and transboundary waters through a programme of integrated management of water and related ecosystems.[60] It is worth noting that the programme area of integrated management[61] goes well beyond

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54 (1992) 31 *International Law Materials*, p.1312.

55 (2001) 40 *International Law Materials*, p.321.

56 Article 3(1)(i), at (1992) 31 *International Law Materials*, pp.1316f.

57 Article 1(2), *idem*, pp.1314f.

58 Article 2(2)(b), *idem*, p.1315

59 Article 2(2)(d), *ibid*.

60 The Helsinki Declaration as Adopted by the First Meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, held at Helsinki (Finland) on 4 July 1997, *Report of the First Meeting* (ECE/MP.WAT/2, 12 August 1997), p.16
at http://www.unece.org/env/water/pdf/ece_mp_wat2.pdf.

61 *Report of the Second Meeting* of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, held at The Hague, Netherlands, from 23 to 25 March 2000 (ECE/MP.WAT/5, 29 August 2000), pp.27f at http://www.unece.org/env/water/pdf/ece_mp_wat5.pdf.

transboundary impacts to include a new holistic understanding of water, allowing the sustainable use and restoration of water-related ecosystems, such as forests and wetlands in addition to the aquatic ecosystems,[62] the breath of which is pointedly commensurable to the 2000 European Water Framework Directive and its holistic approach to water management.[63]

On the other hand, no such parallel can be drawn from the African experience that shows an early awareness of the ecological dimension of the basin approach to transboundary water development and management in treaty practice.[64] The original 1995 SADC Protocol entails a narrow

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62 The Draft Declaration of Madrid, as Adopted by the Third Meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, held at Madrid, Spain (Finland) from 26 to 28 November 2003, (ECE/MP.WAT/2003/14, 3 October 2003), para.8 at http://www.unece.org/env/documents/2003/wat/mp.wat.2003.14e.pdf.

63 Tanzi A., "Achievements and Prospects of the Water Law Process in the UNECE Region" in Proceedings of the Second International Conference on Sustainable Management of Transboundary Waters in Europe, Poland, Miedzyzdroje, 21-24 April 2002, Edited by F. Bernardini *et al*. United Nations Economic Commission for Europe, Convention on the Protection and Use of Transboundary Watercourses and International Lakes, (Szezecin, Poland: UNECE, 2003), p.273; Directive of the European Parliament and of the Council 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy, Luxembourg, 23 October 2000 (PE-CONS 3639/1/00/Rev.1: ENG); Griffiths M., "The European Water Framework Directive: An Approach to Integrated River Basin Management", (2002) 5 *European Water Management Online*, 15 pp., at www.ewaonline.de/journal/2002_05.pdf.

64 Many African agreements are mindful of adverse effects on the biological characteristics of fauna and flora. For example, article 4 of the 1963 Act of Niamey regarding Navigation and Economic Co-operation between the States of the Niger Basin; article 3 of the 1964 Convention relating to the Status of the Senegal River; Status article 4 of the 1964 Convention and Status relating to the Development of the Chad Basin; article 12 of the 1964 Agreement concerning the Niger River Commission and the Navigation and transport on the River Niger; article 4 of the 1972 Convention relating to the Status of the Senegal River; article 3 of the 1977 Agreement Creating the Organisation for the Management and Development of the Kagera Basin; article 4 of the 1978 Convention relating to the Status of the River Gambia; article 4 of the 1980 Convention Creating the Niger Basin Authority, see United Nations Department of Technical Co-operation for Development, *Treaties Concerning the Utilization of International Watercourses for other Purposes than Navigation: AFRICA*, Natural Resources/Water Series No: 13,

consideration of ecosystem protection[65] in so far as the introduction of harmful alien aquatic species into a shared watercourse system is concerned.[66] Indeed, the Revised SADC Protocol[67], adopted by Mozambique's initiative[68] in 2000, merely reiterates the provisions on the environment of the 1997 UN International Watercourses Convention for the sake of consistency[69] but does not intend to elaborate on the latter's ecosystem approach or its uneasy standing to the concept of the so-called "shared" watercourses.

1997 UN International Watercourses Convention: A Critical Overview

At the global level, the ecosystem approach to the use and protection of international watercourses finds its normative expression in article 20 of the 1997 UN International Watercourses Convention, which requires watercourse states to "protect and preserve the ecosystems of international watercourses", and separately, in article 22 regulating the introduction of alien or new species with harmful effects on their ecosystem.[70] However,

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ST/ESA/141, Sales No.E/F.84.II.A.7, (New York: UN, 1984); also see UN Doc. A/CN.4/274, (1974) II:2 *Yearbook of International Law Commission*, pp.289ff.

65 For implementation issues see Lebotse K.K., "Southern African Community Protocol on Shared Watercourses: Challenges of Implementation", (1999) 12:1 *Leiden Journal of International Law*, p.181.

66 Article 2(11) of the Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC) Region, signed at Johannesburg, South Africa, on 23 August 1995, reproduced at www.thewaterpage.com/int_water_law.htm.

67 Article 4(2) of the Revised Protocol of 7 August 2000 on Shared Watercourses in the Southern African Development Community (SADC), (2001) 40 *International Law Materials*, pp.327f.

68 Leestemaker J.H., "An Analysis of the New National and Supra-National Water Laws in Southern Africa: Gaps between the UN Convention, the SADC Protocol and National Legal Systems in South Africa, Swaziland and Mozambique", *Unpublished Paper* (The Hague: Peace Palace Library, 2/5/2000) p.3. (on file with author).

69 Salman, M.A.S., "Legal Regime for Use and Protection of International Watercourses in the Southern African Region: Evolution and Context", (2001) 41:4 *Natural Resources Journal*, pp.1011f.

70 (1997) 36:3 *International Law Materials*, p.710.

insertion in the Convention of the concept of "ecosystem" as a legal basis for international obligations has proven to be more problematic, casting serious doubts over the proposed geographical scope of its application. Notably, the work of the International Law Commission to establish the nascency of the ecosystem approach to protection of international watercourses[71] is far less convincing in its stated evidence with examples of mainly river pollution and its relation to marine waters protection therefrom to rely on both in international treaties and state practice,[72] for neither appears to lend adequate support for a customary formation of some hortative principles of and statements on ecosystem preservation in non-binding international instruments,[73] driven largely by environmental concerns or physical

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71 In distinguishing water pollution from environmental damage which is "harm to *nature* in the broader sense, more specially, perhaps, to biological complexes of myriad sorts", second rapporteur Schwebel claimed in his third report to the ILC that "there has emerged, over and above the rights and obligations which two or more States may confirm and assume vis-à-vis one another, a normative principle making protection of the environment a universal duty even in the absence of agreement, a principle born of sharpened awareness of vast ramifications consequent upon man's tampering with the intricate relationships among the elements and agents of the nature" in spite of the fact that "the law in this field is largely new and less than may be desired by many concerned with the fragility of many of the ecosystems of 'planet earth'". Schwebel (1981), "Third Report", (1982) II:1 *Yearbook of International Law Commission*, pp.123 and 136 *et seq*.; for the same line of argument see McCaffrey in his fourth report relying heavily on precedent for the pollution of international watercourses and its adverse impact on the marine environment, to come up with a proposition of the protection and preservation of the watercourse environment. McCaffrey (1988), "Fourth Report", (1988) II:1 *Yearbook of International Law Commission*, pp.217 *et seq*.; His proposal for an independent obligation as to the environment of international watercourses did not attract a serious criticism in the Commission. See Plenary discussions in 2063nd to 2076th meetings, in *Summary Records of the Meetings of the Fortieth Session*, *Report of the International Law Commission Report on the Work of its Fortieth Session*, A/43/10, (1988) I *Yearbook of International Law Commission*, pp.121-229.

72 For a comprehensive list see Schwebel (1981), "Third Report", (1982) II:2 *Yearbook of International Law Commission*, pp.123-51 and McCaffrey (1988), "Fourth Report", (1988) II:1 *Yearbook of International Law Commission* , pp.217-45.

73 For example, article 3 of the 1986 Final Report of the Experts Group on Environmental Law on Legal Principles for Environmental Protection and Sustainable Development, Munro R.D. & Lammers J.G., *Environmental Protection and Sustainable Development:*

necessities rather than legal imperatives.[74] Although it may be argued that some degree of authority for environmental protection can, by analogy, be derived from articles 192 and 196 of the 1982 UNCLOS, by placing states under an obligation to protect and preserve the marine environment in general and to prevent, reduce and control marine pollution caused by the introduction of harmful alien or new species in particular,[75] on which articles 20 and 22 of the Convention are modelled, their adaptation to the field of international watercourses becomes distinctly controversial in terms of both the meaning to be given to the environment thereof and its ensuing normative implications for the creation of a substantive environmental obligation.[76]

Legal Principles and Recommendations, (London: Graham & Trotman/Martinus Nijhoff, 1987); Fuentes rightly reaches a similar conclusion, noting that "however, and notwithstanding that they are drafted in very rigid terms, it can hardly be said that Articles 20 and 21 codify customary international law [because] none of these instances of State practice [the ILC cited in support] was conclusive", quoted from Fuentes X., "Sustainable Development and the Equitable Utilization of International Watercourses", (1998) 69 *British Yearbook of International Law*, p.171.

74 This tendency is conspicuous in the conceptualisation of environmental scarcity and resultant insecurity as the premise behind an argument, put forward by Brunnee and Toope, for the emergence of ecosystem-orientation in international environmental law. Brunnée J. & Toope S.J., "Environmental Security and Freshwater Resources: A Case for International Ecosystem Law", (1994) 5 *Yearbook of International Environmental Law*, pp.41f and 55ff.

75 United Nations Conference on the Law of the Sea, done at Montego Bay on 10 December 1982, (1982) 21 *International Law Materials*, p.1261; see Beesley's comments, in the 2063th Meeting, *Summary Records*, (1988) I *Yearbook of International Law Commission*, p.132; for a detailed examination of the relationship with Part XII of UNCLOS, see Tanzi A. & Arcari M., *The United Nations Convention on the Law of International Law: A Framework for Sharing*, (London: Kluwer Law International, 2001), pp.232-4.

76 Turkey objected to the use of jurisprudence concerning the law of the sea as a model in the convention, stating that "though the seas also consist of water and geography plays a role in both cases, too much emphasis should not be placed upon this similarity since the differences between the legal natures of these two fields are considerable, The jurisprudence of the law of the sea regulates the rights and competences of States regarding a mainly international area. It is not conceivable that the same principles can be applied to watercourses over which the concerned States have full sovereignty within

Leaving aside the latter issue,[77] the ILC during its deliberations ruled out the use of term "environment" in favour of a more precise concept of ecosystem. This was because not only could the former term "be interpreted quite broadly, to apply to [land] areas "surrounding" the watercourses that have minimal bearing on the protection and preservation of the watercourse itself", but it might as well "be construed to refer only to areas outside the watercourse",[78] whilst dwelling heavily upon UNECE's work leading to the 1992 Helsinki Convention in defining what was meant by ecosystem.[79] This

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their territories." *Draft Articles on the Law of the Non-Navigational Uses of International Watercourses and Resolution on Confined Transboundary Groundwater, Report of the Secretary-General*, UN Doc. A/51/275, 6 August 1996, p.16; For critical views expressed by some ILC members such as Sepulveda Gutierrez and Barsegov in the 2064th Meeting and the 2065th Meeting, see *Summary Records*, (1988) I *Yearbook of International Law Commission*, pp.134f and 143ff.

77 Kroes rightly points out that "the generality of this type of obligation raises questions as to its [normative] utility and value." See Kroes M., "The Protection of International Watercourses as Sources of Fresh Water in the Interest of Future Generations", in *The Scarcity of Water: Emerging Legal and Policy Response*s, Edited by E.H.P. Brans, E.J. de Haan, A. Nollkaemper & J. Rinzema, (London: Kluwer Law International, 1997), p.91.

78 See the ILC commentary, Report of the International Law Commission Report on the Work of its Forty-second Session, A/45/10, (1990) I *Yearbook of International Law Commission*, p.57 and also see, Draft Articles on the Law of the Non-Navigational Uses of International Watercourses and Commentaries thereto, Provisionally Adopted on First Reading by the International Law Commission at its Forty-third Session, September 1991, pp.123ff. (on file with author); a number of Commission members were critical of the use of either term see the comments of Bennouna (2063th Meeting at p.134), Ogiso (*idem*, pp.134f), Rao (2066th Meeting, p.1510 and Tomuschat (2068th Meeting, p.161), Summary Records, (1988) I *Yearbook of International Law Commission*, pp.133 et seq.; Nanda, too, is not certain about the proposed legal precision of the term, ecosystem, see Nanda V.P., "The Law of the Non-Navigational Uses of International Watercourses: Draft Articles on Protection and Preservation of Ecosystems, Harmful Conditions and Emergency Situations, and Protection of Water Installations", (1992) 3:1 *Colorado Journal of International Environmental Law & Policy*, p.180.

79 The ILC adopted the definition of ecosystem as "an ecological unit consisting of living and non-living components that are interdependent and function as a community", with reference to the UNECE's background work for the 1992 Helsinki Convention, entitled "Ecosystems Approach to Water Management" (ENVWA/WP.3/R.7/Rev.1) in *Report*,

may be taken as a clear demonstration of the Commission's intention to interpret the watercourse ecosystem in narrow terms, limited merely to watercourse itself. It appears, at least, consistent with its earlier rejection of any reference to the ambiguous concept of shared natural resources and the basin approach with inherent implications of such land areas surrounding as well as beyond the watercourse, Nevertheless, Birnie, Boyle and Redgwell express doubt "if the Commission's careful choice of terminology really does confine the potential scope of this obligation in a meaningful way".[80] The question is a pertinent one with far-reaching geographical implications for the legal application of the term, "international watercourses". Some commentators seemingly subscribe to an expansive interpretation of the watercourse ecosystem on the basis of a general principle of "cause-effect" relationship between its components, living organisms and their physical environment, as well as with other interdependent ecosystems functionally interacting outside the water-covered areas, in order to include the 'surrounding' land areas in the geographical scope of the Convention's legal application. Some use "a contextual interpretation of the term, watercourse" with normative reference to the obligation as to the pollution of an international watercourse in article 21(2) caused by activities not necessarily limited to watercourse itself in conjunction with the principle of equitable utilisation in article 5(1), which is justified by "the close interdependence in the watercourse between water quality and quantity.[81] Others point to "the

A/45/10, at p.57, n.172 and *1991 Draft Articles*, p.124, n.221; Also relevant are 1992 Recommendations to ECE Governments on Ecosystems-based Water Management (ECE/CEP/10) and 1993 Guidelines on the Ecosystem Approach in Water Management (ECE/ENVWA/31). For an overview of the UNECE regional initiatives see Bosnjakovic B. "Regulation of International Watercourses under the UN/ECE Regional Agreements", (2000) 25:4 *Water International*, pp.544 *et seq*; Added to them is the ecosystem definition given by the Expert Group on Environmental Law of the World Commission on Environment and Development in the comment to article 3 of its Legal Principles and Recommendations, see *supra*, note.72.

80 Birnie, Boyle & Redgwell (2009), *International Law*, p.559.

81 Tanzi A., "The UN Convention on International Watercourses as a Framework for the Avoidance and Settlement of Water Law Disputes", (1998) 11:3 *Leiden Journal of International Law*, pp.448f.; Tanzi & Arcari (2001), *The United Nations Convention*, pp.59-61 and n.54; McIntyre O., "The Emergence of an 'Ecosystem Approach' to the

very nature of things"[82] demanding a legal definition with territorial extension to reflect the watercourse ecosystem's "dynamic inter-relationship among flora and fauna as well as the geophysical elements which sustain them", that is, in effect, what is entailed by the term, environment in the meaning, used by article 21(2).[83]

The first claim that the normative interconnection between articles 20 and 5(1) allows the ecosystem approach to assume primacy, and therefore, to determine the scope of application of the equitable utilisation principle because the latter principle ought to be "consistent with adequate protection of the watercourse", cannot be sustained for the reason: article 1(1) delimits the scope of the Convention to "measures of conservation and management related the use of [international] watercourses and their waters" aimed at certain problems associated with water quality, living resources, flood control, erosion, sedimentation and salt water intrusion but without reference

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Protection of International Watercourses under International Law", (2004) 13:1 *Review of European Community and International Environmental Law*, p.7.

82 Quoted from Evensen (1983), "First Report", (1983) II:1 *Yearbook of International Law Commission*, p.170.

83 Quoted from Okidi (1992), "Preservation and Protection", (1992) 3:1 *Colorado Journal of International Environmental Law & Policy*, p.147; With reference to the ILC commentary to article 21(2) speaking of the environment –somehow broader than an ecosystem-, encompassing "the living resources of the international watercourse, flora and fauna dependent upon the watercourse, and the amenities connected with it", Birnie, Boyle & Redgwell point out that interdependence cannot be confined to the watercourse alone and the protection of whose ecosystem unavoidably calls for inclusion of the surrounding land areas or its environment, see Birnie, Boyle & Redgwell (2009), *International Law*, p.559; for a similar view see, Sohn L.B., "Commentary: Articles 20-25 and 29", (1992) 3:1 *Colorado Journal of International Environmental Law & Policy*, p.216; McCaffrey, too, argues for "the 'ecosystems' of an international watercourse [to] be understood to include not only the flora and fauna in and immediately adjacent to a watercourse, but also the natural features within its catchment that have an influence on, or whose degradation could influence, the watercourse". See McCaffrey S., *The Law of International Watercourses: Non-Navigational Uses*, (Oxford: Oxford University Press, 2001), p.393, and also see McCaffrey S., "The Contribution of the UN Convention on the Law of the Non-Navigational Uses of International Watercourses", (2001) 1:3/4 *International Journal of Global Environmental Issues*, p.256.

to their ecosystem;[84] nor does the definition of watercourse in article 2(b) make any suggestion that can be construed as such.[85] It is true that the ecosystem approach with its vague formulation in article 20 stands isolated[86] and the 'consistency' requirement for adequate protection of the watercourse can only be linked to ecological factors as one of many relevant considerations to be taken in determining what is equitable and reasonable utilisation without an inherent priority, though the ecological factors pertaining to the physical relation of the watercourse to each riparian state in a particular case may be given a greater weight than the others in a balancing process.[87]

However compelling it may be on the face value, the second claim that the physical realities of 'biogeophysical' ecosystem interdependence between a watercourse and its environment will eventually call for the geographical scope of the term, "international watercourse" to be extended to include the surrounding 'land' areas in its drainage basin runs against *the very consensual nature* of international law, that is to say in Caron's words, "the nature of things would not be a source of international law, but rather a motivation for consent".[88] Indeed, such narrow conception of watercourse ecosystem limited to the watercourse itself[89] seems appropriate, given that

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84 Commentary to article 1(1), *Report of the International Law Commission Report on the Work of its Forty-sixth Session*, 2 May – 22 July 1994, UNGA Official Records: Forty-ninth session Supplement No.10 (A/49/10), (New York: UN, 1994) p.198, (on file with author)

85 For a similar conclusion see Benvenisti E., *Sharing Transboundary Resources: International Law and Optimal Resource Use*, (Cambridge: Cambridge University Press, 2002), pp.174f.

86 Nollkaemper A., "The Contribution of the International Law Commission to International Water Law: Does It Reverse the Flight from Substance?" (1996) 27 *Netherlands Yearbook of International Law*, pp.62-7.

87 Article 6(1)(a), (1997) 36:4 *International Law Materials* p.706; Fuentes (1998), "Sustainable Development", (1998) 69 *British Yearbook of International Law*, pp.171ff.

88 Caron D.D., "The Frog That Wouldn't Leap: The Law Commission and Its Work on International Watercourses", (1992) 3:1 *Colorado Journal of International Environmental Law & Policy*, p.273.

89 Brunnée J. & Toope S.J., "Environmental Security and Freshwater Resources: A Case for International Ecosystem Law", (1994) 5 *Yearbook of International Environmental Law*, p.60.

the Commission was at pains not only to exclude land areas outside the watercourse and those surrounding it by purposely opting for the term, "ecosystem" with emphasis on functional instead of geographical interaction, but also to avoid a similar inference from its chosen term, "watercourse" defined as a system in terms of physical relationships without reference to any geographical attributions of drainage basin.[90] On that score, it differs from the 1992 UNECE Helsinki Convention in that the latter's normative aim is to implement the ecosystem approach by way of prohibiting any transboundary impact on the environment in the broad sense of significant harm to the watercourse ecosystem, caused by a human activity occurring in areas outside the watercourse itself as well as within the boundaries of its transboundary waters, because the physical origin of a transboundary impact, whether situated wholly or in part within an area under the jurisdiction of a state, or within an area under the jurisdiction of another state is considered irrelevant.[91]

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90 Nanda is of the same view that "Article 20 correctly places the focus on systems or relationships, rather than geography, thereby ameliorating fears that unrelated lands will be subject to the application of the article." Nanda (1992), "The Law of Non-Navigational Uses", (1992) 3:1 *Colorado Journal of International Environmental Law & Policy*, p.182 and Nanda (1995), *International Environmental Law*, p.276.; Elsewhere Arcari makes a similar point by stating that "the description of a watercourse as a system of water components helps to avoid the "territorial " implications of the concept of drainage basin, assuming that the draft articles apply only to international water resources of States and not to their land territories", Arcari M., "The Draft Articles on the Law of International Watercourses Adopted by the International Law Commission: An Overview and Some Remarks on Selected Issues", (1997) 21:3 *Natural Resources Forum*, p.171; Cf. Brunnée & Toope (1994), *idem*, p.65.

91 Tanzi A., *The Relationship between the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses: Report of the UNECE Task Force on Legal and Administrative Aspects*, (Geneva: UNECE, February 2000), pp.10f.; For the requirement of the integrated management of both internal and transboundary waters also see The Helsinki Declaration as Adopted by the First Meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, held at Helsinki (Finland) on 4 July 1997, *Report of the First Meeting* (ECE/MP.WAT/2, 12 August 1997), p.16 at http://www.unece.org/env/water/pdf/ece_mp_wat2.pdf.

Conversely, a lack of reference to "transboundary impact" to trigger the obligation of watercourse protection in article 20 of the 1997 UN International Watercourses Convention has further caused ambiguity and debate as to the question, whether a watercourse state is also required to protect its own ecosystem from significant harm of no transboundary relevance.[92] The ILC commentary gives the impression that the holistic view of ecosystems integration and interaction places watercourse ecosystems in a more complex array of life-support systems, the protection of which cannot simply be made subject to the transboundary "cause-effect" relationship.[93] But this interpretation would, in effect, mean a further derogation from riparian sovereignty over the use, whose consequences, however harmful, remain fully domestic in nature, of a state's internal waters that may be ecologically linked to an international watercourse. Moreover, it could hardly be deemed consistent with articles of 21, 22 and 23 of the Convention which aim unequivocally at significant harm to other watercourse states, their environment and the marine environment without any implication of ecosystem damages limited essentially to a state's own territory if it were meant to be a general obligation preceding the other more specific articles in Part IV thereof.[94]

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92 Cf. The Sudanese delegation to the Sixth Committee during the discussions over draft article 20 raised another aspect of the general obligation "on all watercourse states to protect and preserve the ecosystem of all international watercourses", urging conversely to limit the scope of a watercourse state's obligation only to the ecosystems of an international watercourse lying within its own territory. UNGA Fifty-first Session, Sixth Committee, Summary Record of the 21st Meeting, Doc. A/C.6/51/SR1, (New York: 15 October 1996), para.64.

93 Birnie, Boyle & Redgwell (2009), *International Law*, p.558; McCaffrey S., *The Law of International Watercourses: Non-Navigational Uses*, (Oxford: Oxford University Press, 2001), p.394; McIntyre (2004), "The Emergence of an Ecosystem Approach", p.8

94 Commentary to article 20, *Report of the International Law Commission,* Forty-sixth session (1994), p.280; Brunnée & Toope set forth that "the Commission formulated this obligation [article 20] without providing for matching rights of other states. Rather, the draft articles retain the traditional approach pursuant to which environmental harm triggers rights only where transboundary effects are felt." See Brunnée J. & Toope S.J., "Environmental Security and Fresh Water Resources: Ecosystem Regime Building", (1997) 91:1 *American Journal of International Law*, p.50

Having said that, there is also the precautionary aspect of protection of international watercourses from purely internal ecosystem damages, whose transboundary impact is neither directly felt nor readily visible at the time, nor even imminent, but rather, carries the likelihood of distant risk of irreversible harm to other watercourse states or their environment.[95] Accordingly, in those cases where the obvious causal link between an internal ecosystem damage and its transboundary consequences is absent due to scientific uncertainty, it is suggested that the presumption favours the extension of watercourse ecosystem protection to the physically-connected internal waters, the use of which may, in the long run, pose a threat of risk to the ecological balance and integrity of an international watercourse system being irreversibly upset wholly or in part.[96] The force behind this argument is a normative expectancy associated with the emerging principle of precautionary action, whose customary status and implementation are still under development in international law. Therefore, adding to the doubts and perplexity that already exist in the geographical scope of watercourse ecosystem, it may unnecessarily cause 'frivolous' claims and counterclaims between states, both riparian or non-riparian, having recourse to the general obligation of ecosystem protection without a need to prove the existence of significant transboundary consequences.[97]

In Conclusion: Troubles Ahead!

With those issues remaining deeply contentious, it is not clear what to make of the UN Convention's ecosystem approach as it is pronounced in such general terms that make it look disharmonious with the rest in so many respects. The lack of consistency may eventually call for a fundamental overhaul of the sectoral way freshwater resources are treated as from the traditional notion of state sovereignty. This is because in essence it purports

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95 Report, *Ibid*, p.287

96 McCaffrey (2001), *The Law of International Watercourses*, pp.394f; Brunnée & Toope (1994), "A Case for International Ecosystem Law", (1994) 5 *Yearbook of International Environmental Law*, pp.64 and 68f.; McIntyre (2004), "The Emergence of an Ecosystem Approach", pp.6ff.

97 Opposite view, McCaffrey (2001), *idem.*

to bring the very element of watercourse environment as an entity in its own right with ecological needs and interests to be protected into the so-called legal equation, currently governed by the territorial interests of sovereign riparian states.[98] That is, unlike other obligations in the Convention, the subject-matter of article 20 is not riparian states *per se* but the watercourse itself, to which the obligation is owed, and protection of whose ecosystem from harm is thus detached from its extraterritorial relevance to a state's environment in order to ensure the ecological integrity and balance of the watercourse system as a whole free from political demarcation.[99] This apparent contradiction arises in large measure from the Convention's failure to appreciate the true potential of the ecosystem approach[100] -which, if fully realised, would require redefining state sovereignty over the watercourse environment in many aspects.[101] It was partly due to the Commission's relatively late inception of devising an appropriate response mechanism in its work to address the emerging global environmental concerns about protection of freshwater resources for human health, welfare and development,[102] raised in a number of international conferences such as the

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98 Brunnée & Toope forcefully argue for a departure from the sole consideration of territorial interests towards ecological imperatives, in "A Case for International Ecosystem Law", (1994) 5 *Yearbook of International Environmental Law*, pp.46, 52-6, and 64-5; also see Brunnée & Toope (1997), "Ecosystem Regime Building", (1997) 91 *American Journal of International Law*, pp.37 *et seq*.

99 It was the outcome of Schwebel's proposal of a normative principle making protection of the environment a universal duty, even in the absence of agreement, over and above the rights and obligations that states assume vis-à-vis one another, Schwebel (1981), "Third Report", (1982) II:1 *Yearbook of International Law Commission*, p.123.

100 Cf. Hafner & Pearson regard the 1997 UN Convention as "the ILC's most significant contribution to international environmental law", see Hafner G. & Pearson H.L., "Environmental Issues in the Work of the International Law Commission", (2000) 11 *Yearbook of International Environmental Law*, pp.15 and 32f.

101 For the effect of environmental interdependencies upon the traditional concept of sovereignty as independence see, Perrez F.X., *Cooperative Sovereignty: from Independence to Interdependence in the Structure of International Environmental Law*, (The Hague: Kluwer Law International, 2000), pp. 123 *et seq*.

102 Tanzi & Arcari (2001), *The United Nations Convention*, p.227.

1977 Mar del Plata Action Plan[103], the 1992 Dublin Statement,[104] Chapter 18 of Agenda 21 of UNCED[105] and the Plan of Implementation of WSSD.[106] However, from neither of these non-binding instruments can there safely be drawn a sufficient authority for a general obligation to protect and preserve the ecosystem of international watercourses in *all areas* within the jurisdiction of a riparian state; nor does general international law, as it stands, provide adequate support for transformation of the ecosystem approach into a customary legal norm despite ever growing global environmental awareness and recognition of the intrinsic 'cause-effect' link between the use of watercourses and their natural ecosystems.[107]

Such state of affairs was evident in the Chinese proposal during the Working Group deliberations over article 20[108] to qualify the territorial connotations of the words "preserve the ecosystems" by changing to the

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103 "Effective legislation should be framed to promote the efficient and equitable use and protection of water and water-related ecosystems", in Recommendation B, *Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977*, UN Doc. E/CONF.70/29 (New York: UN Publ. Sales No.E.77.II.A.12, 1977), p.11.

104 "[..] a holistic approach, linking social and economic development with protection of natural ecosystems", in Guiding Principle 1 of *The Dublin Statement and Report of the International Conference on Water and the Environment: Development Issues for the 21st Century*, (Dublin, Ireland: UN ACC/ISGWR, 26-31 January 1992), p.4.

105 "[..] the perception of water as an integral part of the ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of utilization", in para. 18.8 of Chapter 18 of Agenda 21, Johnson S.P., *The Earth Summit: The United Nations Conference on Environment and Development (UNCED)*, (London: Graham Trotman/Martinus Nijhoff, 1993), p.335.

106 "[..] improve the efficient use of water resources and their allocation [to] balance the requirement of preserving or restoring ecosystems and their functions … with human domestic, industrial and agricultural needs ...", in Para. 26(c) of the Plan of Implementation, *Report the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August – 4 September 2002*, UN Doc. A/CONF.199/20, (New York: UN Publication Sales No. E.03.II.A.1, 2002), p.21.

107 Birnie, Boyle & Redgwell represent the majority view on the legal status of watercourse ecosystem protection, see Birnie, Boyle & Redgwell (2009), *International Law*, p.559; also see McIntyre (2004), "The Emergence of an Ecosystem Approach", pp.13f.

108 Proposals submitted by China for articles 20, 22 and 33, UN Doc. A/C.6/51/NUW/WG/CRP.52.

more commonly used term, "maintain the ecological balance" of international watercourses with a view of making it "more universally comprehensible and acceptable, and align[ing] it further with the purpose of the convention",[109] which "was to make better use of international watercourses, [..] not a convention on the protection of the environment".[110] This proposal gathered a significant support from a number of states including Turkey,[111] which resulted in removal of all references to ecosystem from the preamble and article 5(1), while in return, retaining the term, *ecosystem* in article 20.[112]

Of the three disputing riparians to the Tigris and Euphrates rivers system, Turkey is hence the only state, not only strongly opposed to any reference to ecosystem in the elaboration of the framework convention, but also with China and Burundi, voting against the General Assembly resolution on its final draft, whereas Syria and Iraq subsequently became party to the 1997 UN Convention without voicing an individual support for the ecosystem approach in the Working Group discussions.[113] Notably,

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109 UNGA Fifty-first Session, Sixth Committee, Summary Record of the 21st Meeting, Doc. A/C.6/51/SR1, (New York: 15 October 1996), para.62.

110 UNGA Fifty-first Session, Sixth Committee, Summary Record of the 53rd Meeting, Doc. A/C.6/51/SR.53, (New York: 31 March 1997), para.119; Similar views were expressed by the Slovakian delegation in the 22nd Meeting, Doc. A/C.6/51/SR.22, para.8 and Turkey, which stated that "the main purpose should be to achieve an equitable and reasonable arrangement regulating water utilisation between watercourse states. Any other approach turns the draft articles into a document which unilaterally restricts, in terms of both quantity and quality, the utilisation rights of states in which watercourses originate" in its written comments on the draft articles, UNGA Fifty-first Session, Report of the Secretary-General Doc. A/51/275 (New York: 6 August 1996), p.15.

111 Russian Federation, Spain, Turkey, Thailand, Sudan, Ethiopia, UNGA Fifty-first Session, Sixth Committee, Summary Record of the 53rd Meeting, Doc. A/C.6/51/SR.53, (New York: 31 March 1997), para.110; Malaysia, Colombia, Lebanon, Switzerland, Rwanda, at para. 114, and India at para.120.

112 UNGA Fifty-first Session, Sixth Committee, Summary Record of the 60th Meeting, Doc. A/C.6/51/SR.60, (New York: 3 April 1997), paras.19-49; for a detailed account of negotiations, see Tanzi & Arcari (2001), *The United Nations Convention*, pp.229-30 and 238-41.

113 Turkey in UNGA Fifty-first Session, Sixth Committee, Summary Record of the 60th Meeting, Doc. A/C.6/51/SR.60, (New York: 3 April 1997), para.35; cf. Syria at para.45;

neither of the two downstream states has thus far expressed a particular ecological concern to bring the holistic environmental aspects of their disagreement over the use and protection of the Tigris and Euphrates waters to forefront, presumably due to the lack of appreciable pollution in general.[114] Nevertheless, the legal position of Turkey may yet prove to be precarious in its application to the European Union for membership, which requires the harmonisation of international as well as national environmental policies with the European legal framework, especially reshaped by the holistic view of the 2000 European Water Framework Directive. Turkey's position in the European context may have to lead eventually to a two-tier system of international practice with inherent difficulties at selectively maintaining a persistent objection to the ecosystem approach to only some of its transboundary water resources.[115] By EC Directive 85/337 on Environmental Impact Assessment,[116] Turkey's individual water projects within GAP and the latter as a whole have already been made subject to an obligation to conduct transboundary environmental impact assessment

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Syria signed the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses on 11 August 1997 and then ratified it on 2 April 1998 while Iraq became party by accession on 9 July 2001. at www.un.org.

114 In the Tigris & Euphrates rivers basin where the dispute remains to be "over the 'water quantity' rather than over the 'quality'", Kibaroglu argues for ecosystem protection as a normative pillar of the suggested institutional setting for an international water regime. Kibaroglu A., *Building a Regime for the Waters of the Euphrates-Tigris River Basin*, (London: Kluwer Law International, 2002), pp.248; Elver H., *Peaceful Uses of International Rivers: The Euphrates and Tigris Rivers Dispute*, (Ardsley NY: Transnational Publ., 2002), p.429.

115 In fact, Turkey is undergoing a radical change in its national environmental law with implications for international environmental policy issues. Budak S., *Avrupa Birliği ve Türk Çevre Politikası: Avrupa Topluluğu'nun Çevre Politikası ve Türkiye'nin Uyum Sorunu*, (Istanbul: Büke Yayınları, 2000), pp.360 *et seq*. Also see Pazarcı H., "Avrupa Topluluğu'nda ve Türkiye'de Çevre Mevzuatı" in *Çevre Üzerine*, Türk Çevre Vakfı (Ankara: TÇV Yayını, 1991), pp.62-6

116 European Council Directive 85/337/EEC, *Official Journal* L175, 5 July 1985, p.40, as amended by EC Directive 97/11EC, OJ L73 14 March 1997, p.5, see generally, The Environmental Law Network International (Ed), *International Environmental Impact Assessment: European and Comparative; Law and Practical Experience, Contributions of the International Conference held in Milan in October 1996* (Cameron May, 1997)

domestically in accordance with article 10 of the 1983 Turkish Environmental Act,[117] opening up possibilities of extraterritorial claims to civil remedies under the principles of equal access and non-discrimination[118].

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[117] Environmental Act No.2872, 9.8.1983, came into force by publication in *Official Gazette* No.18132 on 11.8.1983 at pp.46-56, reproduced in *Türk Çevre Mevzuatı: Cilt I,* Türk Çevre Vakfı (Ankara: TÇV Yayını, 1992), p.178; Bagis A.I., *GAP: Southeastern Anatolia Project: The Cradle of Civilisation Regenerated*, (Istanbul: Interbank 1989), p.212; Keleş R. & Ertan B., *Çevre Hukukuna Giriş*, (Ankara: Imge, 2002), pp.105-32.

[118] Boyle A.E., "International Law of Environmental Rights: Remedies For Pollution Injuries" in *Water in the Middle East: Legal, Political and Commercial Implications*, Edited By J.A. Allan & Chibli Mallat, (London: I.B. Tauris Publishers, 1995), pp.93 *et seq*.