CHAPTER 11

Procedural Rules of International Water Law and the Imminent Challenges of the Ecosystem Approach

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Abstract: As the normative implications of emerging obligations to protect and preserve the ecosystems of transboundary watercourses become more clearly understood, the established procedural rules of international water law will be severely challenged. The current procedural rules and mechanisms, which have evolved to facilitate effective inter-State engagement regarding economic utilisation of shared waters, will struggle to accommodate key elements of the so-called "ecosystem approach", including emerging obligations regarding environmental flows and the ecosystem services paradigm. In particular, the established rules will prove unequal to the procedural requirements of adaptive management techniques for maintaining ecological resilience, of broad and meaningful stakeholder and public participation in decision-making, and of complex benefit-sharing arrangements to ensure optimal and sustainable utilisation of shared water resources. While the ecosystem approach holds great promise for the resolution of inter-State water disputes, it is increasingly apparent that the procedural rules and mechanisms of international water law will need to shift away from one-time inter-State communication processes conducted in anticipation of planned water-related developments, and towards more sophisticated continuing procedural engagement focused on ensuring the optimal and sustainable functioning of valuable watercourse ecosystems.

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1 Introduction

Recent developments in international water law highlight the pivotal role of procedural rules in the avoidance and resolution of complex inter-State disputes concerning shared waters and, more generally, their central importance in facilitating the cooperative communication and engagement required to achieve optimal beneficial and sustainable utilisation of ever scarcer water resources. Despite the inherent, and arguably necessary and intended, normative indeterminacy of the key substantive rules and principles of international water law, the procedural rules are increasingly clearly understood, and the engagement thereby enabled offers basin States the opportunity to identify mutually acceptable normative boundaries for the use, management and protection of international waters and related ecosystems. However, the enormous challenges presented by ever increasing global water demand and scarcity, and the related risk of watercourse ecosystems degradation, require significantly more intense procedural engagement among basin States, for which the current procedural frameworks appear wholly inadequate. Exploring the increasingly critical challenge of protecting international watercourse ecosystems while seeking to optimise the beneficial use of scarce water resources, this chapter highlights how established procedural frameworks fall short in the face of the emerging demands ~~of emerging approaches~~ for effective management of watercourse ecosystems in a water-scarce era. This represents a significant shortcoming, as various methodologies associated with the ecosystem approach offer a useful~~the~~ means of identifying, quantifying and reconciling the competing interests of States at issue in international water disputes.

Whereas the pollution control requirements included in Part IV of the 1997 UN Watercourses Convention[1] reflect longer established rules in international water law, the rapidly evolving obligation of ecosystems protection is likely to transform and define international water law in the years to come. This almost universally recognised obligation has fuelled demands for a far-reaching "ecosystem approach" to transboundary water resources management, which reflects growing awareness of watercourses as complex and fragile ecosystems providing a range of indispensable ecosystem services and requiring holistic management of a wide variety of interconnected ecological elements. Whilst it remains true that 'the precise implications of an obligation to protect the ecosystems of international watercourses are not altogether clear',[2] it is nevertheless apparent that the complex and severe threats facing freshwater ecosystems globally[3] require a sophisticated legal response, such as that intended in the ecosystem approach. Such threats include, *inter alia*, ever rising demand for water, food and energy and associated large-scale water resources utilisation,[4] as well as the ecological challenges posed by climate change

[1] Convention on the Law of the Non-Navigational Uses of International Watercourses (adopted 21 May 1997, entered into force 17 August 2014) 36 ILM 700 (UN Watercourses Convention). The 'UN Watercourses Convention' can be regarded as largely embodying the 'state of the art' in international water law.

[2] Stephen C McCaffrey, *The Law of International Watercourses* (2nd edn, OUP 2007) 458.

[3] See Sabine Brels, David Coates and Flavia Loures, *Transboundary Water Resource Management: the Role of International Watercourse Agreements in Implementation of the CBD* (Secretariat of the CBD 2008) 5.

[4] See eg Edith Brown Weiss, *International Water Law for a Water-Scarce World* (Martinus Nijhoff 2013) 1.

and the adaptation measures required to address it.[5] These challenges might easily foment international disputes concerning over-utilised waters.

The evolving ecosystem approach offers the prospect of a sophisticated response that can facilitate integrative management of shared water resources taking account of diverse uses of water and land that may impact upon the functioning of aquatic ecosystems, one that can be adaptive in response to new threats and new insights into ecosystems dynamics and vulnerability, and one that pursues equitable benefit-sharing informed by inclusive participatory decision-making. Indeed, the continuing elaboration of the ecosystem approach and of its constitutive elements may eventually prove crucial to effective realisation of the fundamental objective of international water law, *i.e.* the optimal and sustainable use of shared water resources, at a time when the looming problem of freshwater scarcity has come to be recognised as 'the new environmental crisis of the 21st century'.[6] However, if it is to realise its potential for the avoidance and resolution of international disputes, the ecosystem approach will also require a fundamental reassessment of the adequacy of the established legal frameworks, procedural and institutional, for facilitating meaningful inter-State communication over the cooperative management of shared basins.

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[5] See eg Alistaur Rieu-Clarke, Ruby Moynihan and Bjørn-Oliver Magsig, *Transboundary Water Governance and Climate Change Adaptation: International Law, Policy Guidelines and Best Practice Application* (UNESCO 2015).

[6] See Brown Weiss (n 4) 1, citing 2030 Water Resources Group, *Charting our Water Future: Economic frameworks to inform decision-making* (2030 Water Resources Group 2009) 5.

2 Procedural Rules of International Water Law – the Current Consensus

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Nobody could doubt the absolutely central role of procedural rules within the cooperative framework currently provided by international water law, as these relatively unambiguous rules require the structured exchange of information which is so vital to any meaningful inter-State engagement. Though their significance for inter-State cooperation has long enjoyed judicial and arbitral recognition,[7] in its 2010 judgment in the *Pulp Mills* case the International Court of Justice (ICJ) placed great emphasis on the functional importance of procedural requirements, whether conventional or customary, and did much to clarify the inter-relationship between procedural and substantive rules of international water law.[8] For the purposes of determining a breach of either of the key substantive principles of international water law, that of equitable and reasonable utilisation and that of prevention of significant transboundary harm, the Court identified two categories of due diligence obligation inherent to both – procedural and substantive – and clearly linked the duty to notify, and the closely associated obligation to conduct transboundary environmental impact assessment of planned projects, to satisfaction of

[7] *Lac Lanoux Arbitration (Spain v France)* (1957) 24 *ILR* 101; (1957) 12 *RIAA* 281; (1958) *RGDIP*; (1959) 53 *AJIL* 156.

[8] *Pulp Mills on the River Uruguay (Argentina v Uruguay)* (Judgment) [2010] ICJ Rep 14. See generally, Owen McIntyre, 'The contribution of procedural rules to the environmental protection of transboundary rivers in light of recent ICJ case law' in Laurence Boisson de Chazournes, Christina Leb and Mara Tignino (eds), *Freshwater and International Law: The Multiple Challenges* (Edward Elgar, Cheltenham 2013) 239 –265.

the procedural due diligence obligations.[9] In addition to their role in informing compliance with the substantive obligations, the Court found that the procedural duties of international water law also create binding obligations in their own right,[10] though it suggested that breach of such obligations might not be considered very serious in the absence of actual transboundary harm.[11]

The Court highlighted the cascading nature of the procedural obligations, flowing from the general duty of States to cooperate which, in the context of planned projects likely to impact adversely upon co-riparian States, requires prior notification and, where necessary, consultation and negotiation. In order to be adequate, such notification in turn requires some form of environmental impact assessment that takes full account of the transboundary effects of the project in question.[12] Of course, the requirement to conduct transboundary environmental impact

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[9] See *Pulp Mills* (n 8) inter alia para 77. Substantive due diligence, on the other hand, might involve the adoption and enforcement of national legal requirements regarding water pollution prevention, see *Pulp Mills* (n 8) para 265. See further Owen McIntyre, 'The World Court's Emphasis on Procedural Rules in the Recent *Pulp Mills* Case: Contributing to the Progressive and Coherent Development of International Water Law' (2011) 4 Water Altern 124, 137.

[10] *Pulp Mills* (n 8) para 265.

[11] ibid para 269. In denying Argentina's request for *restitution in integrum*, the Court considered that 'its finding of wrongful conduct by Uruguay in respect of its procedural obligations per se constitutes a measures of satisfaction for Argentina … [a]s Uruguay's breaches of the procedural obligations occurred in the past and have come to an end, there is no cause to order their cessation'.

[12] See ibid para 204.

assessment of planned projects, now recognised as a general requirement under customary international law, has parallels in requirements relating to the ongoing exchange of information on existing water resources utilisation and its environmental impacts, as suggested by the Court's consistent endorsement of a requirement for continuing environmental impact assessment of potentially harmful projects during their operational lifetime.[13] Inevitably, procedural obligations are very closely linked to the establishment of cooperative institutional mechanisms,[14] through which formal exchange of information and inter-State dialogue can take place, and by which detailed basin-level procedural rules on such exchange can be further elaborated and implemented.[15] It is hardly coincidental that the rise to prominence of procedural rules of international water law, acknowledged by the ICJ in recent times, has been accompanied by a proliferation of river basin organisations, boundary waters commissions and similar inter-governmental institutions having clear responsibility for cooperative management of shared water resources.[16] This "institutionalisation" of inter-State cooperation over shared water

[13] See further (n 103) and (n 104).

[14] See *Pulp Mills* (n 8) paras 75–77.

[15] See eg the *ZAMCOM Procedures for Notification of Planned Measures* (2017), available at: <http://www.zambezicommission.org/sites/default/files/clusters_pdfs/ZAMCOM-Procedures-for-Notification-of-Planned-Measures.pdf> (accessed 27 September 2018).

[16] See further Susanne Schmeier, *Governing International Watercourses: River Basin Organizations and the sustainable governance of internationally shared rivers and lakes* (Routledge 2013); Ines Dombrowsky, *Conflict, Cooperation and Institutions in International Water Management: An Economic Analysis* (Edward Elgar 2007).

resources can be understood as reflecting a broader trend in international environmental and natural resources law towards a 'transition from an international law of coexistence to an international law of cooperation'.[17]

Though the precise nature and application of the judicially recognised obligation in general international law to conduct transboundary EIA in respect of potentially harmful projects or activities remains in need of some clarification,[18] it is clear that it plays a key role in ensuring

[17] See Sandrine Maljean-Dubois 'The Making of International Law Challenging Environmental Protection' in Yann Kerbrat and Sandrine Maljean-Bubois (eds), *The Transformation of International Environmental Law* (A Pedone and Hart 2011) 34–35; See also Owen McIntyre, 'Changing Patterns of International Environmental Law-Making: Addressing Normative Ineffectiveness' in Sandrine Maljean-Dubois (ed), *The Effectiveness of Environmental Law* (Intersentia 2017) 187–220; Owen McIntyre, 'The making of international natural resources law' in Catherine Brölmann and Yannick Radi (eds), *Research Handbook on the Theory and Practice of International Law-making* (Edward Elgar 2016) 442–465.

[18] Despite the Court's emphatic emphasis in *Pulp Mills* (n 8) paras 101–105, on the requirement to notify a co-riparian State as soon as possible of a project or activity with potential transboundary effects, in *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua)* (Judgment) [2015] ICJ Rep 665, paras 104–105, the ICJ found that EIA precedes and informs the need for notification, which only becomes necessary where 'the environmental impact assessment confirms that there is a risk of significant transboundary harm' and, further, that '[i]n light of the absence of risk of significant harm, Nicaragua was not required to carry out an environmental impact assessment'. At

that environmental (and, increasingly, social) considerations relating to a planned or continuing use of an international watercourse are adequately understood and communicated. Such considerations may therefore be taken properly into account, either as a factor within the balancing process that lies at the heart of equitable and reasonable utilisation, or as a key component of the procedural due diligence element of the duty to prevent significant transboundary environmental harm. In either role transboundary EIA may also facilitate application of certain associated principles and approaches of international water and environmental law, such as the precautionary principle, thereby allowing these concepts to inform the actions of national decision-makers. However, as a "front-loaded" assessment mechanism normally employed to inform one-time decision-making processes determining whether to permit implementation of a planned project, use or activity, it is not at all clear that EIA, at least as currently employed and conducted, is suited to facilitating the kind of flexible adaptive management approach which is increasingly regarded as suitable for complex

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the same time, in the joined case, *Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v Costa Rica)* (Judgment) [2015] ICJ Rep 665, para 154, the Court observed that 'to conduct a preliminary assessment of the risk posed by an activity is one of the ways in which a State can ascertain whether the proposed activity carries a risk of significant transboundary harm', thereby requiring an environmental impact assessment. It seems, therefore, that the Court has retreated from its earlier finding, in *Pulp Mills* (n 8) para 105, that a State must inform 'as soon as it is in possession of a plan which is sufficiently developed to permit a preliminary assessment … [or] … at the stage when the relevant authority has had the project referred to it with the aim of obtaining initial environmental authorization and before the granting of that authorization'.

ecological systems such as major watercourses.[19] Though watercourse States are under an ongoing obligation to exchange information on the conditions in the watercourse, this is neither sufficiently elaborated in conventional instruments nor developed in practice to ensure effective ecosystems protection.

3 The Ecosystem Approach: the New Paradigm in Transboundary Water Management

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Whereas pollution control obligations have long been a central element of international water law,[20] the modern development of the field has been characterised by growing concern regarding the integrated protection of watercourse ecosystems in order to maintain the range of indispensable ecosystem services provided thereby. Consider, for example, an influential 2008 study conducted under the auspices of the Convention on Biological Diversity which noted that '[g]lobally, these [freshwater] ecosystems are in serious decline, due largely to the pressures

[19] See eg Barbara Cosens, Lance Gunderson and Brian Chaffin, 'The Adaptive Water Governance Project: Assessing Law, Resilience and Governance in Regional Socio-Ecological Water Systems Facing Climate Change' (2014) 51 Ida Law Rev 1, 10; Alejandro Iza, Alexandra Müller and Vaéentina Nozz, 'Adaptive Water Governance: Lessons Learned from Implementing an Ecosystem Approach in Mesoamerica' in Kheng-Lian Koh and others (eds), *Adaptation to Climate Change: ASEAN and Comparative Experiences* (World Scientific 2015) 57–81.

[20] See eg Helsinki Rules, Chapter 3: Pollution, International Law Association (ILA), Helsinki Rules on the Uses of Waters of International Rivers, ILA, *Report of the Fifty-Second Conference of the International Law Association* (Helsinki 1966).

placed upon water by its various users, and the rate of loss of biodiversity in them surpasses that from other major biomes by a considerable margin'.[21] Such awareness and concern is epitomised by the express inclusion in Part IV of the UN Watercourses Convention of an unequivocal obligation regarding the protection of watercourse ecosystems,[22] in respect of which an "ecosystem" has been defined, in a manner consistent with prevailing legal and scientific thinking, as an 'ecological unit consisting of living and non-living components that are interdependent and function as a community',[23] thereby including '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'.[24] At the same time, a clear trend towards State acceptance of obligations of ecosystems protection has long been evident globally in the elaboration of the environmental aspects of international water law.

[21] Brels, Coates and Loures (n 3) 5.

[22] UN Watercourses Convention, art 20.

[23] ILC, Commentary to the Draft Articles on the Law of the Non-Navigational Uses of International Watercourses, *Report of the International Law Commission on the Work of its Forty-Sixth Session*, UN GAOR 49th Sess, Suppl No 10, UN Doc A/49/10 [1994], 118.

[24] Stephen C McCaffrey, *The Law of International Watercourses: Non-Navigational Uses* (OUP 2001) 393.

This is apparent in both basin agreements[25] and regional framework conventions[26] concerning shared transboundary water resources.[27] The 1992 UNECE Water Convention, one of only two globally applicable framework conventions relating to shared international freshwater resources, provides a notable example of a formerly regional instrument, setting out extensive and detailed provisions for the conservation and restoration of the ecosystems of shared basins.[28] Early guidelines adopted under the UNECE Water Convention even elaborate upon the meaning and implications of the so-called "ecosystem approach".[29] As a framework convention, originally applying across the wider European region, the ecosystem protection provisions of the UNECE Water Convention have inspired a number of subsequently adopted European river basin

[25] See eg Great Lakes Water Quality Agreement (22 November 1978) 30 UST 1383, TIAS No 9257, arts I and II; Agreement on Cooperation for Sustainable Development of the Mekong River Basin (5 April 1995) 34 ILM 864, arts 3 and 7.

[26] See eg the original Protocol on Shared Watercourse Systems in the Southern African Development Community (28 August 1995) (SADC) arts 2(3), 2(11) and 2(12).

[27] See generally Owen McIntyre, 'The Emergence of an "Ecosystem Approach" to the Protection of International Watercourses under International Law' (2004) 13 RECIEL 1.

[28] UNECE, Convention on the Protection and Use of Transboundary Watercourses and International Lakes (adopted in 1992, entry into force 1996) 1507 UNTS 167, arts 1(2), 2(2)(b), 2(2)(d) and 3(1)(i).

[29] UN, Guidelines on the Ecosystem Approach in Water Management, (December 1993) UN Doc ECE/ENVWA/31.

agreements, which demonstrate a correspondingly broad commitment to ecosystem protection.[30] Emerging rules on shared international groundwater resources take a similar approach, with the International Law Commission (ILC) 2008 Draft Articles on Transboundary Aquifers stressing 'the role of the aquifer or aquifer system in the related ecosystem' and calling upon States 'to ensure that the quantity and quality of water retained in an aquifer or aquifer system, as well as that discharged through its discharge zones, are sufficient to protect and preserve such ecosystems'.[31]

Article 20 of the UN Watercourses Convention appears, therefore, to recognise an autonomous customary obligation to preserve and protect watercourse ecosystems, with the 1994 ILC commentary confidently declaring that '[t]here is ample precedent for the obligation contained in article 20 in the practice of States and the work of international organizations', before proceeding to list a wide range of relevant authorities.[32] However, the ILC also links the obligation to protect the ecosystems of international watercourses to the overarching principle of

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[30] Including the Convention on the Protection of the Rhine (22 January 1998) arts 2, 3 and 5; the Convention on Cooperation for the Protection and Sustainable Use of the Danube River (29 June 1994) arts 1(c), 2(30) and 2(5); the Agreements on the Protection of the Meuse and Scheldt (26 April 1994) art 3; and the Framework Agreement on the Sava River Basin (3 December 2002) 2367 UNTS 688, art 11(a).

[31] ILC, 2008 Draft Articles on Transboundary Aquifers, arts 5(1)(i) and 10, *Report of the International Law Commission on the Work of Its Sixtieth Session*, II(2) *Yearbook of the International Law Commission* (2008). See also UNECE, Model Rules on Transboundary Groundwaters (2014) provision 2.1.

[32] ILC (n 23) 119–121.

equitable and reasonable utilisation set out in Articles 5 and 6 of the Convention, by explaining that it 'is a specific application of the requirement contained in article 5 that watercourse States are to use and develop an international watercourse in a manner that is consistent with adequate protection thereof'.[33] This suggests that ecosystems protection is central to, though by no means limited to, determination of equitable and reasonable utilisation, and thus to the allocation of uses and quantum share of international waters. The ICJ would appear to have confirmed this position over 20 years ago by concluding in the *Gabčíkovo-Nagymaros* Case that (Czecho)Slovakia had deprived 'Hungary of its right to an equitable and reasonable share of the natural resources of the Danube – with the continuing effects of the diversion of these waters on the ecology of the riparian area of the Szigetköz'.[34]

Growing awareness of and concern for watercourse ecosystems has over time led to 'the adoption of less economic-oriented criteria for the management of freshwater resources, following an "ecosystem approach"'.[35] Distinguishing this approach from traditional pollution control, a seminal early study advises that

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[33] ibid 119.

[34] *Gabčíkovo-Nagymaros Project (Hungary v Slovakia)* (Judgment) [1997] ICJ Rep 7, para 85. See further McCaffrey (n 2) 458, who links the obligation to protect watercourse ecosystems with the 'community of interest' concept, which is inherent to equitable and reasonable utilisation.

[35] See Atilla Tanzi and Maurizio Arcari, *The United Nations Convention on the Law or International Watercourses* (Kluwer Law International 2001) 8–9.

an "ecosystem approach" requires consideration of the whole system rather than individual components. Living species and their physical environments must be recognized as interconnected, and the focus must be on the interaction between different sub-systems and their responses to stresses resulting from human activity.[36]

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Beyond the field of international water law, conservation of ecosystems is identified as a key objective of the 1992 Convention on Biological Diversity (CBD),[37] with the fifth meeting of the CBD Conference of the Parties (COP) endorsing the "ecosystem approach" as the primary framework for action under the Convention, and defining it as 'a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way'.[38] COP 5 also adopted 12 principles to guide the practical implementation of the ecosystem approach including, for example: that '[c]onservation of ecosystem structure and functioning … should be a priority target of the ecosystem approach' (Principle 5); that '[e]cosystems must be managed within the limits of their functioning' (Principle 6); and that '[t]he ecosystem approach should be undertaken at the appropriate spatial and temporal scales' (Principle 7).[39]

[36] Jutta Brunnée and Stephen J Toope, 'Environmental Security and Freshwater Resources: A Case for International Ecosystem Law' (1994) 5 YbIEL 41, 55.

[37] Convention on Biological Diversity (5 June 1992) 1760 UNTS 79, art 1. In addition, art 8(f) obliges State parties to "rehabilitate and restore degraded ecosystems".

[38] See CBD Decision V/6, Ecosystem Approach (22 June 2000) UN Doc UNEP/CBD/COP/5/23.

[39] ibid; See also CBD Decision VII/11 (13 April 2004) UN Doc UNEP/CBD/COP.7/21.

Though still somewhat underdeveloped in the field of international water law, some guidance on the practical application of an ecosystem approach is available under related conventional regimes. For example, the Ramsar Convention COP recognised early the hydrological, biological and ecological importance of wetlands in the context of a drainage basin,[40] and subsequently adopted detailed guidelines relevant to the management of river basins, including shared international river basins. A notable example is provided by 1999 *Guidelines for integrating wetland conservation and wise use into river basin management*,[41] which set out detailed recommendations on the conservation of river basin ecosystems, including a dedicated section on 'international cooperation' concerning 'special issues related to shared river basin and wetland systems'. In 2002 the Ramsar COP adopted *Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands*,[42] which are highly relevant as international best-practice informing cooperative inter-State allocation of shared waters, where such waters are connected to Ramsar designated wetlands.

Nevertheless, the ecosystem approaches being tentatively adopted within a variety of sectoral environmental regimes in international law can still be described as elusive, unstable and contested and as 'responding to two broadly competing logics roughly aligned with what is usually referred to as ecocentrism and anthropocentrism'.[43] The former involves 'quite a radical

[40] See eg *The Criteria for Identifying Wetlands of International Importance*, first endorsed by Recommendation 4.2 adopted by COP 4 (Montreaux 1990).

[41] Ramsar Convention, Resolution VII.18, COP 7 (San José 1999).

[42] Ramsar Convention, Resolution VIII.1, COP 8 (Valencia 2002).

[43] Vito De Lucia, 'Competing Narratives and Complex Genealogies: The Ecosystem Approach in International Environmental Law' (2015) 27 J Environ Law 91, 94. See further Vito

shift' and resonates with 'many of the themes central to deep ecology',[44] while the latter, which is more in keeping with articulations of the ecosystem approach in current international environmental law, views the imperative of ecosystems protection in terms of the need to 'preserve the resource base necessary to sustain global production and consumption patterns'.[45] This anthropocentric focus helps to explain why the ecosystem approach 'is deployed often in connection with the conceptual framework of ecosystem services, by some considered one of the core elements of EA'.[46] Though commentators generally agree that the concept can be 'interpreted differently in different contexts',[47] some consensus is emerging regarding certain core elements of the ecosystem approach, at least at the scientific level.[48] However, it is precisely

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De Lucia, 'Beyond anthropocentrism and ecocentrism: a biopolitical reading of environmental law' (2017) 8(2) Journal of Human Rights and the Environment 181–202.

[44] De Lucia, ibid 103–104.

[45] ibid 104 and 106.

[46] ibid 104.

[47] In relation to application of an ecosystems approach in the specific context of the marine environment, see Report on the Work of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its Seventh Meeting (17 July 2006) UN Doc A/61/156, 6. See also Ronán Long, 'Legal Aspects of Ecosystem-based Marine Management in Europe' (2012) 26 Ocean Yearb 417–484.

[48] See eg Arie Trouwborst, 'The Precautionary Principle and the Ecosystem Approach in International Law: Differences, Similarities and Linkages' (2009) 18 RECIEL 26, 28, who relies on Grumbine's seminal 1994 study, see R Edward Grumbine, 'What is Ecosystem Management?' (1994) 81 Conserv Biol 27, 31.

these core elements which present such a challenge for the effectiveness of the procedural rules now established in international water law and, in order to understand better the nature of this procedural challenge, it is necessary to examine several of these elements in turn.

3.1 Environmental Flows

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Despite some continuing uncertainty, particular features of an ecosystem approach as applied in the specific context of international water law are beginning to come to light. Most notably, emerging requirements to maintain minimum environmental flows will play a central role in effective implementation of an ecosystem approach in transboundary basins.[49] Environmental flows are intended to provide 'a methodological approach that incorporates environmental concerns into the process of allocating water rights among different users',[50] where the overriding objective 'is to modify the magnitude and timing of flow releases from water infrastructure (*e.g.* dams) to restore natural or normative flow regimes that benefit downstream river reaches and their riparian ecosystems'.[51] The concept is defined in a soft-law instrument as 'the quantity, timing and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems'.[52]

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[49] See Owen McIntyre, 'The Protection of Freshwater Ecosystems Revisited: Towards a Common Understanding of the "Ecosystems Approach" to the Protection of Transboundary Water Resources' (2014) 23 RECIEL 88, 90–92.

[50] Brels, Coates and Loures (n 3) 13.

[51] N LeRoy Poff and John H Matthews, 'Environmental Flows in the Anthropocene: Past Progress and Future Prospects' (2013) 5 Curr Opin Environ Sustain 667, 1.

[52] International Water Centre, *The Brisbane Declaration* (3–6 September 2007).

Though the issue of environmental flows is seldom addressed directly in international water instruments, its legal character must be understood as 'part of a broader notion of taking an ecosystem approach', and so 'the relevant international instruments are not only those directly dealing with water resources, but also those that have a primary focus on the protection of nature and ecosystems'.[53]

A requirement to maintain minimum environmental flows, derived from more established normative principles of international environmental law, received ground-breaking judicial support in the *Kishenganga Arbitration* before a Permanent Court of Arbitration tribunal, which concluded, on several possible legal grounds, that 'hydro-electric projects … must be planned, built and operated with environmental sustainability [and minimum environmental flow in particular] in mind' ~~on several possible legal grounds~~.[54] At an earlier stage in the proceedings, the Tribunal granted Pakistan's request for interim measures, thereby preventing India from conducting any 'permanent work on or above the riverbed that may inhibit the restoration of the full flow of that river to its natural channel'.[55] Though the ICJ refused provisional measures in respect of Costa Rica's concerns that dredging of the river and diversion of the water 'was

[53] Megan Dyson, Ger Bergkamp and John Scanlon (eds), *Flow: The Essentials of Environmental Flows* (IUCN 2003) 87–88.

[54] *Indus Waters Kishenganga Arbitration (Pakistan v India)*, PCA Case no 2011-01, Partial Award (18 February 2013) paras 450–452 and 454, and Final Award (20 December 2013). See further Stephen C McCaffrey, 'International Water Cooperation in the 21st Century: Recent Developments in the Law of International Watercourses' (2014) 23 RECIEL 4, 5–9; McIntyre (n 49) 91.

[55] Order on Interim Measures (23 September 2011) para 151.

creating a risk of irreparable prejudice to Costa Rica's environment or to the flow of the San Juan River', several judicial statements appear to have indirectly recognised the legal significance of maintaining flow for ecological purposes.[56] A 2011 study assessing State and treaty practice notes that '[t]he need to provide environmental flows in order to conserve ecological integrity of water basins is becoming more and more important',[57] while a 2013 analysis conducted by a broad coalition of international actors concludes that '[t]here is now wide recognition of the importance of maintaining an appropriate flow regime to maintain the ecological health of river basins'.[58]

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[56] *Certain Activities Carried Out by Nicaragua in the Border Area* (*Costa Rica v Nicaragua*) Request for Provisional Measures Order [2011]. See eg Separate Opinion of Judge Sepulveda-Amor, para 25; Declaration of Judge Greenwood, para 15. In its 2015 judgment in this case, the Court appears to have recognised the possibility that interference with the flow of a transboundary river, where substantial, could amount to significant transboundary harm, *supra*, (n 18) para 105: 'the Court finds that the dredging programme planned in 2006 was not such as to give rise to a risk of significant transboundary harm, *either with respect to the flow of the Colorado River* or to Costa Rica's wetland' (emphasis added).

[57] Grethel Aguilar and Alejandro Iza, *Governance of Shared Waters: Legal and Institutional Issues* (IUCN 2011) 99.

[58] Robert Speed and others, *Basin Water Allocation Planning: Principles, Procedures and Approaches for Basin Allocation Planning* (UNESCO 2013) 58.

As the legal nature of the obligation to maintain flows becomes ever clearer, by means of the emerging practice of international courts,[59] water convention secretariats,[60] and national regulators,[61] the science is similarly advancing for 'the quantification of the linkages between hydrological processes and components and various ecological variables'.[62] Commentators have identified certain "guiding elements" for environmental flows, including the need to describe flow-ecology and flow-social relationships, the need to engage stakeholders in setting environmental water objectives, and the need to integrate environmental flow considerations into infrastructure planning and operation.[63] Beyond water convention regimes, certain multilateral environmental convention secretariats have produced technical guidance on aspects of the

[59] See Kishenganga Arbitration (n 54).

[60] See eg Mekong River Commission, *ISH Study 0306: Development of Guidelines for Hydropower Impact Mitigation and Risk Management in the Lower Mekong Mainstream and Tributaries*, Vol 2, (MRC, December 2015) 13, 39–40, 82–85, 123–129, 188–192 and 208–211.

[61] See eg María A Gómez-Balandra, María del Pilar Saldaña-Fabela and Maricela Martínez-Jiménez, 'The Mexican Environmental Flow Standard: Scope, Application and Implementation' (2014) 5 J Environ Prot 71–79.

[62] See N LeRoy Poff, Angela H Arthington and Rebecca Elizabeth Tharma, 'Evolution of Environmental Flows Assessment Science, Principles, and Methodologies' in Avril C Horne and others (eds), *Water for the Environment: From Policy and Science to Implementation and Management* (Elsevier 2017) 203.

[63] ibid 225–227.

calculation and implementation of environmental flow requirements,[64] as have leading environmental civil society organisations.[65] Academic researchers similarly continue to develop and refine environmental (or ecological) flow methodologies.[66]

3.2 Ecosystem Services

The overarching objective of an ecosystem approach, and thus of any regime for maintaining environmental flows, appears increasingly to centre around the concept of ecosystem services, which aims to enhance awareness of the nature and value of socially beneficial services provided by natural ecosystems and to provide a methodology for valuation and consideration of such services within the decision-making processes of international water law. The 2005 Millennium Ecosystem Assessment provides an essential typology of four categories of ecosystem services, comprising supporting services, provisioning services, regulating services and cultural services,[67] which can assist in transboundary water cooperation by providing watercourse States with a common understanding of the costs and benefits for each State of measures for the utilisation and

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[64] See eg Janine Adams, *Determination and Implementations of Environmental Water Requirements for Estuaries* (Ramsar Convention Secretariat / Secretariat of the CBD, 2012)<https://www.ramsar.org/sites/default/files/documents/pdf/lib/rtr9-estuaries.pdf > (accessed 6 February 2020).

[65] See eg Dyson, Bergkamp and Scanlon (n 53).

[66] See eg Andy D Beaton and Andrea Bradford, 'Demonstration of a Methodology for Setting Ecological Flow and Water Level Targets' (2013) 38 Can Water Resour J 296.

[67] Millennium Ecosystem Assessment, *Ecosystems and Human Wellbeing: Synthesis* (Island Press 2005) 39–48.

protection of shared watercourse ecosystems. In this way, the ecosystem services concept improves the likelihood~~prospect~~ of an agreement for benefit-sharing arrangements amongst watercourse States, leading to both optimised utilisation and more effective protection of shared watercourse ecosystems.[68] Similarly, accepted methodologies for valuing ecosystem services may facilitate consideration of State responsibility for transboundary ecological harm.[69] In either role, the ecosystem approach can function, in theory at least, to facilitate the avoidance and resolution of inter-State water disputes.

Despite concerns regarding a 'lack of attention to ecosystem services within the context of transboundary freshwater ecosystems and law',[70] use of such methodologies is becoming more common in the practice of transboundary water cooperation. Recognising the direct linkage between ecosystem components and services, the Mekong River Commission (MRC) has developed an approach to ecosystem management that 'can involve an assessment of the ecosystem components and/or an assessment of the ecosystem services that are derived from the

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[68] Owen McIntyre, 'Benefit-sharing and upstream/downstream cooperation for ecological protection of transboundary waters: opportunities for China as an upstream State' (2015) 40 Water Int 48, 69.

[69] See Owen McIntyre, 'Responsibility and Liability in International Law for Damage to Transboundary Freshwater Resources' in Mara Tignino~~, G Pflieger~~ and Chritian Bréthaut (eds), *Research Handbook on Freshwater Law and International Relations* (Edward Elgar, Cheltenham, ~~forthcoming~~ 2018) 335.

[70] Alistair Rieu-Clarke and Chris Spray, 'Ecosystem Services and International Water Law: Towards a More Effective Determination and Implementation of Equity' (2013) 16(2) PELJ 12, 13.

interaction of those components in support of human well-being'.[71] Guidance on water resources management for the maintenance of ecosystem services has also been developed under the auspices of the Ramsar Convention[72] and the CBD.[73] The CBD Strategic Plan for Biodiversity 2011–2020 confirms that a key purpose of biodiversity conservation is that of safeguarding ecosystem services essential for human well-being and includes a number of targets relating to the ecosystem services provided by inland waters.[74] An emerging legal obligation to maintain ecosystem services is supported by recent statements of the UN Special Rapporteur on Human Rights and the Environment framing the issue as a human right of access to ecosystem services.[75]

The discourse on ecosystem services is routinely accompanied by discussion of the potential role of payment for ecosystem services (PES) and, though this issue 'is still emerging and frankly not well explored in the legal scholarship',[76] key institutional actors in the field of

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[71] MRC (n 60) 214.

[72] Daniela Russi and others, *The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands* (IEEP / Ramsar Secretariat 2013).

[73] CBD, *Revised Programme of Work on Inland Water Biological Diversity*, CBD Decision VII/4 (2004), Annex.

[74] CBD, *Strategic Plan for Biodiversity 2011–2020*, CBD Decision X/2 Annex, para 13.

[75] *Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, health and sustainable environment* (19 January 2017) UN Doc A/HRC34/49, 4.

[76] AH Benjamin, 'Payment for ecosystem services' (2013) 16(2) PELJ 1. See further Rieu-Clarke and Spray (n 70).

transboundary water resources management have seen fit to provide detailed guidance on how such payment systems might work,[77] with UNECE guidance explaining that

> 'Such financing mechanisms operate at many levels, between and within countries, from and to governments, the private sector and local communities. Payment for ecosystem services (PES) is an innovative tool for rewarding ecosystem managers for their sustainable management practices, which increase ecosystem resilience.[78]

PES can now inform watercourse States' engagement over shared transboundary waters because '[t]his linkage between the upstream provision of services … and the downstream utilisation of services thus provided (often water-related) has now become widely recognised and can be seen to operate on very large, often transboundary scales'.[79] At any rate, PES arrangements are likely in practice to be utilised as one element integrated into the kind of broader benefit-sharing arrangements discussed further below. Such arrangements provide~~s~~ a potentially very useful means of rebalancing the competing State interests in a shared watercourse giving rise to water resources disputes. Leading commentators tend to agree that '[i]n most cases, benefit-sharing

[77] See eg IUCN, *PAY: Establishing payments for watershed services* (IUCN 2006).

[78] UNECE, *Guidance on water and adaptation to climate change* (UNECE 2009).

[79] Rieu-Clarke and Spray (n 70) 25.

will require some sort of redistribution or compensation which will be highly situation specific'.[80]

4 Imminent Challenges in Procedural Engagement

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While the precise normative implications of the ecosystem approach continue to emerge, it is accepted that it 'prioritizes conservation with a view to ensuring ecosystem functioning and resilience … [and] … conditions sustainable use to the taking into account of the limits of ecosystem functioning and promotes connectivity'.[81] Consistent with the overarching requirements of international water law, the ecosystem approach outlined under the CBD is also understood to emphasise social equity, by identifying and seeking to balance 'tangible and intangible values attached to biodiversity', and to have a key role in facilitating 'multilateral approaches to fair and equitable benefit-sharing'.[82] Therefore, as posited in the introductory

[80] Ricard Paisley, 'Adversaries into partners: International water law and the equitable sharing of downstream benefits' (2002) 3 MJIL 280–300. See further Claudia W Sadoff and David Grey, 'Cooperation on international rivers: A continuum for securing and sharing benefits' (2005) 304 Water Int 420–427; A Dan Tarlock and Patricia Wouters, 'Are shared benefits of international waters an equitable apportionment?' (2007) 18 Colorado J Int Environ Law Pol 523–536.

[81] Elisa Morgera, 'The Ecosystem Approach and the Precautionary Principle' in Michael Faure (ed), *Elgar Encyclopaedia of Environmental Law* (Edward Elgar 2017) 70–80.

[82] Elisa Morgera, *Multilateral Benefit-Sharing: Whither from Here?* (20 June 2016) Benelux Project blog-post, available at:

section above, the ecosystem approach as applied to the management of shared international freshwater resources, and to the resolution of related disputes, appears to require cooperative arrangements that can be adaptive in response to new science and new threats, including that of climate change, that rely upon inclusive participatory decision-making, and that facilitate complex benefit-sharing with a view to achieving optimal use of international water resources and equitable sharing of the benefits associated therewith. However, each of these features suggests a level of procedural engagement and multi-party communication for which the established procedural rules of international water law are quite inadequate.

4.1 Adaptive Management

As regards certain important mechanisms for implementing an ecosystem approach, such as that of broad stakeholder participation,[83] general international water law appears as yet rather underdeveloped. This is particularly true of the paradigm of adaptive management, which is increasingly regarded as central to effective application of an ecosystem approach,[84] and

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http://www.benelexblog.law.ed.ac.uk/2016/06/20/multilateral-benefit-sharing-whither-from-here/; See also CBD Decision V/6 (n 38).

[83] See further *infra*.

[84] See eg CBD Secretariat Guidelines (n 38) 1, which state: "The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Ecosystem processes are often non-linear, and the outcome of such processes often shows time-lags. The result is discontinuities, leading to surprise and uncertainty. Management must be adaptive in order to be able to respond to such uncertainties and contain elements of

involves a strategy that is 'iterative and flexible, responsive to the constantly changing conditions of both complex ecosystem processes and available scientific knowledge'.[85] Adaptive management is necessary to cope with fundamental uncertainty regarding the functioning of complex dynamic socio-ecological systems, the value of certain ecosystems and their services, and the potential effects of certain policies and projects on the functioning of ecosystems.[86] We might expect such uncertainty to be exacerbated, and adaptive strategies to become ever more necessary, in light of the threat of climate variability to freshwater ecosystems.[87] Stated simply, adaptive management seeks to ensure the "resilience" of an ecosystem, *i.e.* 'the ability of a system to cope with inevitable changes [which] is, thus, the precondition for the health of that

'learning-by-doing' or research feedback. Measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically."

[85] De Lucia (n 43) 93.

[86] Elina Raitanen, 'Legal Weaknesses and Windows of Opportunity in Transnational Biodiversity Protection: As Seen Through the Lens of an Ecosystem Approach-Based Paradigm' in Sandrine Maljean-Dubois (ed), *The Effectiveness of International Law* (Intersentia 2017) 81, 93.

[87] See J McDonald and MC Styles, 'Legal Strategies for Adaptive Management under Climate Change' (2014) 26(1) *Journal of Environmental Law* 25–53; JB Ruhl, 'Climate Change Adaptation and the Structural Transformation of Environmental Law' (2010) 40 Environ Law 343.

system',[88] by adopting a systematic approach for adapting and improving natural resources management by learning from previous management interventions.[89]

However, beyond the intrinsic flexibility of the normatively indeterminate principle of equitable and reasonable utilisation, incorporation of adaptive measures into conventional systems of legal rules is problematic, largely due to traditional prioritization of the stability of legal regimes over their flexibility, especially where such regimes are intended to facilitate investment in large-scale water infrastructure. Thus, States are reluctant to surrender sovereign control of shared water resources to the kind of joint institutions that would necessarily be charged with implementing adaptive management.[90] As limited exceptions to the rule, the 1996 Farraka Treaty[91] and the 2002 Incomati-Maputo Agreement[92] can be cited as rare examples of

[88] Raitanen (n 86) 93. See further A Dan Tarlock, 'The Nonequilibrium Paradigm in Ecology and the Partial Unravelling of Environmental Law' (1994) 3 Loy LA L Rev 1123.

[89] Byron K Williams, 'Adaptive Management of Natural Resources: Frameworks and Issues' (2011) 92 J Environ Manage 1339, 1346–1353.

[90] See Michelle Lim, 'Is Water Different from Biodiversity? Governance Criteria for the Effective Management of Transboundary Resources' (2014) 23 RECIEL 96–110. See further A Dan Tarlock, 'Four Challenges of International Water Law' (2010) 23 TELJ 369, 383–384.

[91] Treaty on Sharing of the Ganga Waters at Farakka (New Delhi, 12 December 1996) arts II and X.

[92] Tripartite Interim Agreement for Cooperation on the Protection and Sustainable Utilisation of the Water Resources of the Incomati and Maputo Watercourses (Johannesburg, 29 August 2002) art 10 and Annex I.

agreements that create mechanisms for the mutually agreed adjustment of flows during times of drought and flooding.[93] However, traditional legal frameworks for natural resources management tend to be 'based on historic conditions and linear patterns of change', whereas '[t]he complex and uncertain dynamics of interconnected ecosystems and social systems … require that resource regulators and managers have a certain amount of discretion',[94] something that is not often afforded to cooperative transboundary institutions (where they exist) by sovereign watercourse States.

The procedural rules of international water law are most firmly established, and most highly elaborated, in respect of planned measures, where conventional instruments provide for inter-State notification and, where necessary, for structured consultation and negotiation.[95] Clearly, the outcomes traditionally produced by inter-State procedural engagement in respect of such large-scale water-related utilisation or infrastructure projects have sought to ensure legal stability above all else. This is evident from judicial recognition of the significant role played in the effective implementation of such procedural engagement by environmental impact assessment (EIA), itself a one-time, front-loaded process which assumes the possibility of predicting and mitigating adverse impacts well in advance of the commencement of a project.[96]

[93] See Lim (n 90) 105–6.

[94] Raitanen (n 86) 95.

[95] Consider, eg, the detailed provisions contained in Part III of the UN Watercourses Convention. See also, the detailed procedures and guidelines adopted under the auspices of several basin agreements, such as the ZAMCOM Procedures for Notification of Planned Measures (23 February 2017).

[96] See *Pulp Mills* (n 8) para 204.

Therefore, legal frameworks for transboundary cooperation must evolve to create suitably empowered and capacitated institutions employing highly sophisticated procedures for inter-State engagement over shared water resources. Legal arrangements reflecting such an approach would accommodate uncertainty through flexible decision-making procedures which permit 'incremental and gradual changes that transition experimentally to new standards or arrangements, while monitoring, assessing and adjusting these changes and their effects'.[97]

Though this will present significant challenges for the procedural and institutional arrangements currently prevailing in international water law, the requirement for adaptive resilience governance is not without some legal authority. Strong links exist between adaptive management and the precautionary principle, as both seek to accommodate scientific uncertainty[98] and the former can be regarded as a means of implementing the latter,[99] which enjoys extensive support as customary law.[100] The inverse is also true. Precaution is commonly understood to be an integral aspect of the application of the ecosystem approach, which can itself in turn be legally justified as a precautionary measure.[101] Of course, the ecosystem approach may already enjoy autonomous legal authority, at least in the field of international watercourses.[102]

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[97] Raitanen (n 86) 96.

[98] Robert Kundis Craig, '"Stationarity is Dead" – Long Live Transformation: Five Principles for Climate Change Adaptation Law' (2010) 34 Harv Envtl L Rev 9, 46–48.

[99] Raitanen (n 86) 97.

[100] See eg Owen McIntyre and Thomas Mosedale, 'The Precautionary Principle as a Norm of Customary International Law' (1997) 9 J Environ Law 221–241.

[101] See Trouwborst (n 48) 26.

[102] ibid 30.

Consistent ICJ endorsement in transboundary watercourses cases of a requirement for 'continuing' environmental assessment might be taken to amount to judicial recognition of the important role of adaptive ecosystem-based management in certain situations of scientific uncertainty. The Court stated unequivocally in the *Pulp Mills* case, for example, that 'once operations have started and, where necessary, throughout the life of the project, continuous monitoring of its effects on the environment shall be undertaken',[103] thereby building upon Weeramantry's earlier endorsement in *Gabčíkovo-Nagymaros* of the "Principle of Continuing Environmental Impact Assessment".[104]

4.2 Broad Stakeholder Participation

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[103] *Pulp Mills* (n 8) para 205. See further Owen McIntyre, 'The World Court's Emphasis on Procedural Rules in the Recent *Pulp Mills* Case: Contributing to the Progressive and Coherent Development of International Water Law' (2011) 4 Water Altern 124, 142.

[104] See *Gabčíkovo-Nagymaros Case* (n 34) Separate Opinion of Judge Weeeramantry, paras 108–110. See also Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court, Judgment of 20 December 1974 in the *Nuclear Tests (New Zealand v France)* (Judgment) [1995] ICJ Rep 457, 344; *Legality of the Use by a State of Nuclear Weapons in Armed Conflict* (Advisory Opinion) [1996] ICJ Rep 66, 140.

Though Rio Principle 10 proclaims a general principle of public participation,[105] which is equally applicable to the management of shared transboundary water resources[106] and might reasonably be considered to reflect established customary international law,[107] international water agreements which include an express requirement concerning the involvement of stakeholders or the wider public are relatively rare. In this regard, international water law appears out of step with the advice of the community of water experts[108] and with developments in general international law. It is worth noting, for example, that Article 13 of the International Law Commission's 2001 Draft Articles on Prevention of Transboundary Harm from Hazardous Activities includes an obligation to consult affected populations within any process facilitating transboundary EIA, and the commentary thereto makes it quite clear that, in addition to the

[105] Rio Declaration on Environment and Development (14 June 1992) UN Doc A/CONF.151/26/Rev.1.

[106] See eg Carl Bruch, 'Evolution of Public Involvement in International Watercourse Management' in Carl Bruch and others (eds), *Public Participation in Governance of International Freshwater Resources* (UNU Press 2005) 21–22, 28.

[107] See eg Jona Razzaque, 'Information, public participation and access to justice in environmental matters' in Shawkat Alam and others (eds), *Routledge Handbook of International Environmental Law* (Routledge 2012) 140; Jonas Ebbesson, 'Principle 10: Public Participation' in Jorge E. Viñuales (ed), *The Rio Declaration on Environment and Development: A Commentary* (OUP 2015) 287.

[108] On the significance of meaningful public participation for effective basin management, see eg Paul A Sabatier and others (eds), *Swimming Upstream: Collaborative Approaches to Watershed Management* (MIT Press 2005).

provision of information to the public, it would require States 'to ascertain the view of the public' likely to be affected, as '[w]ithout that second step, the purpose of the article would be defeated'.[109]

Conventional international water law's focus upon inter-State engagement to the exclusion of meaningful public participation is epitomised by Part III of the UN Watercourses Convention, containing detailed rules on all aspects of inter-State notification of planned measures, reply to such notification and, where necessary, consultation and negotiation concerning such measures.[110] Similarly, Article 9 of the Convention only provides for the regular exchange of data and information at the inter-State level, neglecting to say anything about public or stakeholder access. Though the UNECE Water Convention is often regarded as 'arguably leading the charge on producing instruments which strengthen joint institutions and stakeholder participation',[111] the Convention itself only requires State parties to make information relating to

[109] ILC, *Report of the International Law Commission on the Work of its 53rd Session* (23 April – 1 June and 2 July to 10 August 2001) UN Doc A/56/10, 165. See further Owen McIntyre, 'The Proceduralisation and Growing Maturity of International Water Law' (2011) 22 J Environ Law 475, 496–497.

[110] Arts 11–19 are widely regarded as the Convention's greatest contribution to the corpus of rules comprising international water law.

[111] Ruby Moynihan, 'Inland water biodiversity: international law on protection of transboundary freshwater ecosystems and biodiversity' in Elisa Morgera and Jona Razzaque (eds), *Biodiversity and Nature Protection Law* (Edward Elgar 2017) 200. See further Ruby Moynihan and Bjørn-Oliver Magsig, 'The Rising Role of Regional Approaches in

the management of transboundary freshwater resources available to the public[112] and says little about public participation. Some European basin agreements inspired by the UNECE Water Convention have tended to take a similarly restrictive approach as regards public or stakeholder participation,[113] whilst others have sought to be more inclusive.[114] There also exist a limited number of basin agreements from other regions, most notably in Africa, which expressly stipulate a requirement of public consultation, such as the 2004 ZAMCOM Agreement[115] and the 2003 Lake Tanganyika Convention.[116]

International Water Law: Lessons from the UNECE Water Regime and Himalayan Asia for Strengthening Transboundary Water Cooperation' (2014) 23 RECIEL 43–58.

[112] UNECE Water Convention (n 28) art 16.

[113] See eg the Convention on Cooperation for the Protection and Sustainable Use of the Danube River (Sophia, 29 June 1994) art 14.

[114] See eg the Convention on the Protection of the Rhine (Bern, 12 April 1999) art 14, which provides for NGOs to act as observers, make submissions and enter into consultations with the Commission.

[115] See eg the Agreement on the Establishment of the Zambezi Water Commission (Kasane, 13 July 2004) art 16(8) of which provides that: 'Member States shall ensure that the Public in an area likely to be affected by a proposed programme, project or activity are informed thereof and are provided with the opportunity for making comments thereon or objections thereto as well as on the transmittal of such comments or objections to the Commission'.

[116] See eg the Convention on Sustainable Management of Lake Tanganyika (Dar es Salaam, 12 June 2003), which in addition to setting out 'the principle of participation' in art 5(2)(d),

Public participation is clearly recognised as central to the ecosystem approach in the practice developed under the CBD. Of the 12 principles identified by CBD COP 5 to guide implementation of the ecosystem approach, Principle 12 recommends the involvement of all sectors of society, while Principle 11 exhorts decision-makers to make use of all forms of information, including indigenous knowledge.[117] Similarly, Goal 2.5 of the CBD's Revised Programme of Work on Inland Water Biological Diversity recommends that

> Relevant national stakeholders, including representatives of indigenous and local communities, are involved, as far as appropriate, in the policy-making and in the planning, implementation and monitoring of the implementation of the programme of work.[118]

Likewise, the 2004 guidelines on implementing the ecosystem approach adopted by CBD COP 7 '[r]ecommend that Parties and other Governments facilitate the full and effective participation of indigenous and local communities and other stakeholders'.[119]

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includes a detailed art 17 dedicated to 'Public Participation in Decision Making Processes'.

[117] CBD Decision V/6 (n 38).

[118] CBD Decision VII/4 (2004) Annex, 22.

[119] CBD Decision VII/11 (n 39) 2, para 10.

Despite a dearth of treaty practice expressly providing for public participation in respect of shared international waters, many treaty regimes either require[120] or promote[121] reliance upon frameworks for EIA of planned projects in order to avoid and minimise adverse impacts and to facilitate meaningful inter-State notification. At any rate, the ICJ has described the obligation to conduct an EIA in respect of a major project likely to impact an international watercourse as a 'requirement under general international law',[122] thereby suggesting that its inclusion in an applicable conventional instrument isn't required. Whilst recognising a requirement for transboundary EIA in *Pulp Mills*, the Court found that 'no legal obligation to consult the affected populations arises for the Parties from the instruments invoked by Argentina'.[123] However, the Court appears to have been addressing a quite specific argument put to it in international law, as it also held that 'it is for each State to determine in its domestic legislation … the specific content of the environmental impact assessment required in each case'.[124] The Court thus makes it clear that States should rely on their domestic EIA regimes, which are universally in place around the world, in giving effect to their international obligation to conduct EIA. While the domestic EIA

[120] See eg the Lake Tanganyika Convention (n 116) art 15.

[121] Article 12 of the UN Watercourses Convention notably suggests that 'notification shall be accompanied by available technical data and information, including the results of any environmental impact assessment, in order to enable the notified States to evaluate the possible effects of the planned measures'; See also, the ILC Draft Articles on Transboundary Aquifers (n 31) art 15(2).

[122] *Pulp Mills* (n 8) para 204. See further McIntyre (n 103) 141.

[123] ibid *Pulp Mills*, para 216.

[124] ibid para 205.

regimes everywhere in place provide 'an almost universally accepted framework methodology for studying and communicating precisely those contentious aspects of a planned project or activity which are necessary for effective decision making',[125] one would struggle to find such a national regime where public or stakeholder participation is not a central element. It is telling, for example, that the 1991 UNECE Convention on Transboundary Environmental Impact Assessment, which is primarily intended to inform the development at the national level of 'the necessary legal, administrative or other measures' in respect of activities likely to cause significant adverse transboundary impact, requires that '[t]he concerned Parties shall arrange for distribution of the documentation to the authorities and the public of the affected Party in the areas likely to be affected and for the submission of comments to the competent authority of the Party of origin'.[126]

In addition, a significant number of international watercourses have in place permanent institutional structures, many of which assist in facilitating structured stakeholder engagement. As one commentator has noted, 'practice shows that effective institutional management has a degree of flexibility that allows for public input'.[127] A detailed study from 2013 has shown that,

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[125] McIntyre (n 109) 496.

[126] Convention on Environmental Impact Assessment in a Transboundary Context (signed 25 February 1991, entered into force 10 September 1997) 1989 UNTS 309. It is worth noting that the activities listed in Appendix I to the Convention as requiring EIA of their transboundary effects include inland waterways and ports, large dams and reservoirs, large-scale groundwater abstraction activities, large-scale pulp and paper manufacturing, major mining operations, and deforestation of large areas – all activities likely to have a significant ecological impact upon a major watercourse.

[127] Lim (n 90) 104.

at that time, there existed 117 river basin organisations (RBOs) covering 116 transboundary rivers out of a global total of 263.[128] The same study notes that 'RBOs do not act in isolation in their respective river and lake basins', but instead engage a range of external actors, including 'NGOs, civil society groups, knowledge groups and research networks … as well as other regional institutions either directly dealing with water resources issues … or implicitly influencing river basin governance through their regional principles, norms, rules and activities'.[129] This is important for effective ecosystems protection, and leading commentators note that

> effective governance requires a bottom-up approach, and one that often sits more easily with non-governmental organisations, working at the interface between state and society. Such "trusted intermediaries" can often work across national or sub-national boundaries with a greater flexibility than state bodies, building local consensus around environmental protection and enhancement, and ultimately ecosystem service delivery.[130]

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However, if one accepts that effective public or stakeholder participation is crucial for the protection and preservation of watercourse ecosystems, and thus for achieving optimal and sustainable utilisation of international watercourses and, by implication, for the avoidance or resolution of international water disputes, it is quite clear that the prevailing paradigm for

[128] Schmeier (n 16) 65.

[129] ibid 108.

[130] Rieu-Clarke and Spray (n 70) 46.

procedural engagement in international water law, with its almost exclusive focus on inter-State communication, is not fit for purpose. In its discussion of the 'Effectiveness of Public Participation in Decision Making' regarding shared international water resources, the Millennium Ecosystem Assessment chapter on Freshwater Ecosystems provides an indication of the inherent complexity of the participation issues potentially arising, noting that

> It may be limited by factors such as: geographic isolation, common in upper watershed areas; language and educational barriers; access to information that is timely and relevant; whether participation is made possible in the early phases of a process (planning and defining problems); whether the decision process provides an opportunity for deliberation and learning; and legal frameworks that define rights (land tenure, for example) and provide measures of recourse, all of which determine the relative bargaining power of various stakeholders.[131]

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[131] B Aylward and others, *Millennium Ecosystem Assessment, Chapter 7 – Freshwater Ecosystem Services*, 227, available at <https://www.millenniumassessment.org/documents/document.312.aspx.pdf>(accessed 27 September 2018).

While participatory rights are developing rapidly within the related fields of human rights law[132] and environmental law,[133] it is clear that implementation of the ecosystem approach will demand significant progressive advances in terms of the inclusiveness of the procedural rules employed in international water law.

4.3 Benefit-Sharing Arrangements

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Greater focus in the practice of international water diplomacy and law on the concept of ecosystems services, and on closely related obligations regarding environmental flows, as well as greater understanding and acceptance of the methodologies involved in each, raises the prospect of more extensive reliance upon so-called "benefit-sharing" arrangements in order to optimise beneficial use of ever-scarcer water resources whilst maintaining watercourse ecosystem integrity.[134] Such benefit-sharing arrangements would typically involve some form of payments

[132] Rieu-Clarke and Spray (n 70) 48. See further Owen McIntyre, 'The Role of the Public and the Human Right to Water' in Mara Tignino and Komlan Sangbana (eds), *Public Participation and Water Resources Management: Where Do We Stand in International Law?* (UNESCO 2015) 139–146.

[133] As epitomised by the UNECE Arhus Convention on Accession to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, (Aarhus, 25 June 1998) 38 *ILM* 517 (1999) and by the new Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú, 4 March 2018), which opened for signature on 27 September 2018.

[134] See generally McIntyre (n 68).

for benefits, or payments for costs associated with enhanced stewardship of a shared transboundary watercourse normally taken by an upstream State.[135] The ecosystem services concept provides a structured methodology for the economic and social valuation of the benefits of watercourse ecosystems, including non-marketable benefits, and can thus permit their integration into benefit-sharing arrangements. Similarly, the PES paradigm may have a key facilitating role to play where the benefit to the optimised, and in lieu of which compensation would be owed to another (most likely upstream) State as part of a benefit-sharing arrangement, is that of ecological integrity and/or the ecosystem services accruing from a functioning transboundary riverine ecosystem. Leading commentators have noted that such methodologies for the identification and valuation of benefits provided by international watercourse ecosystems, where widely accepted, can help to provide 'a common point of departure' for negotiations over benefit-sharing.[136] In other words,

> the difficult task of crafting complex benefit-sharing arrangements focused on ecosystem protection, including arrangements to compensate the upstream States concerned, might now be more possible than before due to the sophisticated tools and methodologies emerging under the "ecosystem approach" to transboundary water management.[137]

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[135] See further Sadoff and Grey (n 80).

[136] ibid; see McIntyre (n 68) 60.

[137] McIntyre ibid 72.

The potential of such sophisticated arrangements for the avoidance and/ or resolution of inter-State water disputes is obvious.

However, it is nevertheless clear that 'the difficult task of crafting complex benefit-sharing arrangements', as well as their effective implementation and management over time, will require an ongoing regime of intense and highly technical inter-State engagement which is utterly beyond the capacity of the currently established procedural rules of international water law. The practice of benefit-sharing with respect to international watercourses is widely understood to have its origins in a 1961 treaty concluded between Canada and the United States which provided for the construction and operation of three infrastructure projects on the Colombia river located within Canadian territory, but designed to maximise benefits in the United States.[138] The treaty relates to hydropower generation, irrigation and flood control, whilst also providing for corresponding compensation payments to Canada. The process of negotiating the original treaty was lengthy and complex. Negotiations were facilitated by the International Joint Commission established under the 1909 Boundary Waters Treaty,[139] but also required the establishment of the International Columbia River Engineering Board, which in turn set up an

[138] Treaty Relating to Cooperative Development of the Water Resources of the Columbia River Basin (17 January 1961) 15 UST 1555, 543 UNTS 244. Renegotiation of the Treat commenced in May 2018 and was ongoing at the time of writing. See <https://www.state.gov/p/wha/ci/ca/topics/c78892.htm>(accessed 29 January 2019).

[139] Treaty relating to the Boundary Waters, and Questions Arising Along the Boundary between the United States and Canada, UN Legislative Texts and Treaty Provisions (1909) ST/LEG/SerB/12, 260.

Engineering Committee which had responsibility for 'obtaining data and analysing the situation' and carried out a series of extensive studies on the basin.[140] This experience strongly suggests that, 'due to the novelty of benefit-sharing as a cooperative paradigm and the inherent complexity of the considerations and calculations involved, a sophisticated legal and institutional framework for cooperation would be required for formulating related proposals'.[141] Indeed, in contrast~~mpar~~ing the relative success of the benefit-sharing regime in the Colombia basin with the problems experienced in attempts to introduce benefit-sharing in the Amu Darya and Syr Darya basins, commentators have blamed the lack of effective binding procedural requirements and competent institutional arrangements for water cooperation in Central Asia.[142]

On the basis of detailed case studies of benefit-sharing arrangements around the world, commentators have emphasised the critical importance of structured engagement with all stakeholders and of the related 'instititionalization' of transboundary water cooperation,[143] and further stress

The need for long-term commitment: The coherent management of trans-boundary watercourses cannot be introduced over short time periods, in any geography. Activities such as encouraging

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[140] See further Paisley (n 81).

[141] McIntyre (n 68) 51.

[142] Tarlock and Wouters (n 81).

[143] D Phillips and others, *Trans-Boundary Water Co-operation as a Tool for Conflict Prevention and Broader Benefit Sharing* (Ministry of Foreign Affairs Sweden: Global Development Studies No 4, Stockholm 2006) 172.

desecuritization, addressing sovereignty and building trust amongst co-riparians require significant time …[144]

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Therefore, benefit-sharing arrangements focused on the preservation of watercourse ecosystems and the maintenance of ecosystem services will require highly capacitated, permanent institutions capable of facilitating intense ongoing procedural engagement between watercourse States. The currently established legal and institutional frameworks for cooperation have largely evolved to facilitate "one-time" notification, consultation and negotiation in respect of the unilateral implementation of large-scale infrastructure or water utilisation projects. To date, such inter-State engagement has tended to be based upon front-loaded technical assessments of the impacts of the planned projects in question and of the interests of the States concerned, which are intended to inform national permitting decisions.

5 Conclusion

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The emergence of wide-ranging ecosystems obligations within international water law was always likely to have profound implications for the structure and composition of this corpus of rules, which has until relatively recently served primarily to accommodate competing economic uses of shared international freshwater resources. However, as the normative parameters of the far-reaching ecosystem approach as applied to transboundary waters continue to take shape, the true nature and extent of these implications are becoming clearer. While the rather normatively indeterminate substantive rules of international water law, encompassing both the principle of

[144] ibid 182.

equitable and reasonable utilisation and the duty to prevent significant transboundary harm,[145] would appear to enjoy the inherent flexibility to accommodate ecological interests and concerns, it is the procedural rules which may struggle in this regard. Though the detailed and unambiguous procedural rules set out in the 1997 UN Watercourses Convention have largely been regarded by lawyers in this field as the Convention's crowning achievement, it is increasingly apparent that the technical approaches and methodologies being developed to provide the ecosystem approach with normative meaning and to facilitate its practical implementation in the specific context of shared waters represent a significant challenge to established patterns of inter-State communication and engagement.

First of all, the requirement to adopt a precautionary ecosystem approach incorporating, where relevant, elements of adaptive management, along with the related requirement to engage in continuing environmental impact assessment, experimentation and monitoring, suggests the need for much more sophisticated and intense inter-State procedural engagement, ensuring continuing communication of the results of structured and targeted monitoring, modelling and research. Secondly, the participatory decision-making regarded as central to the adoption of an ecosystem approach will require a shift away from the current exclusive focus on inter-State communication and towards procedural frameworks that ensure effective and meaningful engagement with key stakeholders and the public. The modalities of such consultation with stakeholders and the public are very much more complex, particularly at the transboundary level, and appropriate procedural frameworks will require a sophisticated approach, drawing on lessons

[145] See further Owen McIntyre, 'Substantive Rules of International Water Law' in A Rieu-Clarke, Alistair Allen and Sarah Hendry (eds), *Routledge Handbook of Water Law and Policy* (Routledge 2017) 234–246.

learned in such fields as human rights, to ensure open and equitable accessibility, transparency and participation. Finally, the ever more urgent imperative of ensuring optimal and sustainable use of increasingly scarce water resources, combined with the emergence of elaborate ecosystem-based methodologies for identifying and valuing water-related interests and benefits, will encourage States to resort more to complex benefit-sharing arrangements in the cooperative management of shared water resources. Such arrangements will also demand a sophistication in the supporting rules and mechanisms for procedural engagement which is quite unlike anything available among today's established procedural frameworks.

The emerging ecosystem approach offers the prospect of a new water resources management paradigm which can assist watercourse States to avoid, or at least to work towards resolving, the international water-related disputes which are more likely to arise in an increasingly water-scarce world. However, its effective deployment will require a significant upgrading of the supporting procedural rules of international water law.

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