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New Approaches for International Water Resources

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Abstract

As a body of rules and a basis for inter-State cooperative practice, international water law suffers from certain important shortcomings. Most significantly, it is characterised by substantive normative indeterminacy, and from related deficiencies in its associated procedural and institutional frameworks, which retard its progressive development and limit its capacity to respond to the looming challenges of the impending global water crisis. Though it has evolved progressively in recent years to incorporate a far-reaching obligation upon watercourse States to adopt an ecosystem approach to the management of shared watercourses, this very development highlights international water law's systemic difficulty in accommodating water management techniques which are critically important to effective implementation of such an approach and, ultimately, to addressing the water crisis. Such techniques, with which international water law struggles, include multi-faceted benefit-sharing, adaptive management, and public and stakeholder participation. The latter two are considered essential for implementation of an ecosystem approach, while the former comprises a cooperative technique facilitated by an ecosystem approach, by means of which watercourse States might eliminate inefficiencies and ensure optimal utilisation of shared water resources. These problems illustrate the urgent imperative of continuing to develop and refine, if not completely reimagine, the rules of international water law.

Keywords

Ecosystem approach; benefit-sharing; adaptive management; public participation;

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1. Introduction

It is worth noting, in this 50th anniversary edition of *Environmental Policy & Law*, that the birth of modern international water law can be traced back just over 50 years to the seminal codification of key rules and principles contained in the International Law Association's 1966 Helsinki Rules on the Uses of the Waters of International Rivers.[i] The contribution of this non-binding guideline, produced and adopted by a learned association on its own initiative, cannot easily be overstated. It first collated the fundamental substantive and procedural rules applying in this sub-field of international natural resources law and has prescribed the basic format for international water agreements ever since.[ii] Building upon this foundation, general international water law has emerged as a stable, yet inherently flexible framework, not alone designed to take account of the varied interests of watercourse States including, for example, those of upstream and downstream States and those of more developed and less developed States, but also proving capable of evolving in order to take account of growing environmental awareness and concern for human welfare. Of course, such flexibility must inevitably result in a measure of normative indeterminacy and international water law has not in all cases provided a set of universally shared understandings upon which all watercourse States have been able to agree. Whereas practically all States today accept the key principles of international water law, disagreement persists in certain shared basins regarding their normative implications and means of effective implementation.

While such dissonance frustrates cooperative water resources management in shared basins where the application of international water law is contested, it has been more generally unhelpful by acting to retard the progressive development of this body of rules[iii] in order that it might be better able to respond to the looming challenges of the impending global water crisis. Though certain aspects of the practice of international water law appear to be evolving organically in the light of growing awareness of the fragility of watercourse ecosystems and the emergence of increasingly sophisticated methodologies to assist sustainable water management, this may not be enough to avert the projected increase in inter-State competition over shared waters, which could easily undermine progress made thus far in building an appropriate edifice of international rules to govern this sensitive area.

This paper commences by outlining the looming challenges presented by ever-increasing water use, relentless and accelerating degradation of aquatic ecosystems, and the growing spectre of climate variability. It then proceeds to summarise the current state of international water law, including a frank appraisal of its limitations and shortcomings, whilst attempting to identify certain necessary improvements which international water law may, regrettably, struggle to adopt.

2. Looming Challenges in International Water Resources Management

Few could disagree that the global freshwater crisis is increasingly acknowledged to be 'the new environmental crisis of the 21st century.[iv] Population growth and changes in lifestyle have caused water demand to rise exponentially, with global water requirements in 2030 expected to be double those in 2005. Notwithstanding the likely impacts of climate change, agricultural water use, which currently accounts for over 70 percent of total demand, looks set to continue

increasing sharply, as does industrial water use and demand for water in energy generation and cooling. On this basis, most experts project a significant global water deficit in terms of projected direct human demand for water.[v] However, many such projections fail to take account of the quantum of water required to ensure the effective functioning of the various ecosystems providing essential services on which all humanity depends. The serious problem of global decline in freshwater ecosystems has long been noted, so that 'the rate of loss of biodiversity in them [freshwater ecosystems] surpasses that from other major biomes by a considerable margin'.[vi] This trend continues and may even be escalating, with recent data showing that populations of migratory freshwater fish have plummeted globally by 76 percent on average since 1970 while, more generally, wildlife populations found in freshwater habitats have suffered a decline of 84 percent – the starkest average population decline in any biome.[vii]

Of course, increased human, agricultural and industrial use of water resources must also impact on water quality, further restricting the water available for particular purposes, especially where there is limited governance or capacity for effective pollution control or wastewater treatment. The expected impacts of climate change can only exacerbate the freshwater crisis, with increases in global temperatures, changing precipitation patterns and the melting of glacial 'water towers' likely to increase stress on water resources, especially in many of the most populous and least capacitated States. In addition, rising sea levels and increases in the frequency and severity of storms and flood events are also expected to impact upon the availability of freshwater and the management of shared watercourses.

It is vital, therefore, that the cooperative framework provided by international water law compels State actors to bear in mind that water, though renewable, remains a finite resource subject to the natural limits of the hydrological cycle and, further, that the parameters of the hydrological cycle are likely to alter markedly in response to climate variability. Generally, there is increasing concern that competition will inevitably intensify between co-basin States for the right to use shared transboundary water resources due to 'local water crises caused by our use of water at rates faster than local hydro-cycles replenish, in other words, unsustainable water use'.[viii] As one leading commentator suggests regarding the implications for international water law of such imminent challenges:

> 'The traditional legal principles upon which existing water management is based will likely be insufficient to deal with the water problems that loom from projected climate change, population growth, food production, increased industrialization, and ecosystem needs. While water law has evolved significantly over the past century, it will need to change further to address these challenges.'[ix]

3. The Current Position in International Water Law

The relatively recently codified corpus of modern international law regarding the utilisation of shared international water resources is already quite well settled around three key rules: the principle of equitable and reasonable utilisation,[x] widely regarded as the overarching cardinal rule in the field; the duty to prevent significant transboundary harm;[xi] and the duty to cooperate in the management of shared waters.[xii] Though the UN Watercourses Convention, the first global conventional instrument in the field, was adopted by the UN General Assembly in June

1997, but only obtained the 35 ratifications required to enter into force in August 2014, watercourse States' reticence was more due to questions regarding relative primacy, emphasis and nuance than to fundamental disagreement over the central rules articulated therein. The first two of these key rules are understood as creating the core substantive obligations for watercourse States, the effective implementation of which infers a range of related, ancillary normative requirements including procedural rules to facilitate inter-State communication.[xiii] The duty to cooperate can be regarded as a composite obligation comprising a comprehensive suite of such procedural requirements, including the duty to exchange information relevant to use of the watercourse, the duty to notify co-riparian States of planned projects potentially impacting a shared watercourse and, where necessary, duties to consult and negotiate with such States in a good faith effort to address their concerns. There have also emerged related substantive rules, principles and standards which further inform the applicable due diligence standards inherent to the three core rules. These notably include duties relating to the prevention, reduction and control of pollution of transboundary waters and concerning the maintenance and conservation of riverine ecosystems.[xiv]

Despite this trend towards the convergence of international water law around three basic, yet broad and flexible principles, this body of rules remains dynamic and is continuously interacting with, and being shaped by, other prolific and highly pervasive field of normativity, including international environmental law, international human rights law and international investment law.[xv] While the central relevance of environmental values to transboundary water use and management has long been apparent, the social protection values inherent to equitable and reasonable utilisation are increasingly pronounced. In particular, the priority routinely accorded to safeguarding 'vital human needs' related to the use of shared water resources, have become very closely intertwined with the discourse on the human right to water ongoing in international human rights law.[xvi] Such values are further emphasised by the universally adopted efforts to realise Sustainable Development Goal 6 on clean water and sanitation for all.[xvii] Of course, the practice of international water law is commonly concerned with major investment projects, often involving foreign private or public sector investors, and often having the potential to impact upon the environment of an international watercourse, upon a co-basin State's right to utilise the waters in question, or upon local people's access to adequate water resources or other ecosystem services. Thus, tensions may arise with normative frameworks established in the field of international economic law concerning the legal protection of foreign investors[xviii] or concerning compliance with the environmental and social safeguard policies of multilateral development banks or other international financial institutions.[xix]

It has long been recognised that international water law, as a flexible normative framework requiring the equitable balancing of the diverse legitimate interests of basin States, must inevitably involve intense inter-State procedural engagement, which can only be effectively facilitated by the establishment of permanent, technically competent institutional machinery. The pivotal role of such institutional mechanisms in ensuring effective inter-State communication and, thereby, giving effect to any conception of equitable and reasonable utilisation was acknowledged in Recommendation 51 of the Action Plan for the Human Environment adopted at the seminally important 1972 Stockholm Conference, which called for the 'creation of river basin commissions or other appropriate machinery for cooperation between interested States for water resources common to more than one jurisdiction', and set down a number of basic principles by which the establishment of such bodies should be

guided.[xx] Although such institutional structures can take quite diverse forms and may enjoy varying functional mandates and capacity, there today exists at least 119 river basin organisations (RBOs) performing an extensive range of coordination and joint management roles.[xxi] Such reliance on inter-State institutional mechanisms and the taking of a so-called 'common management' approach to international water resources demonstrates a considerable degree of commitment to achieving equitable and reasonable utilisation and recognition of the existence of a community of interest among co-basin States.[xxii]

Despite the relatively settled nature of international water law, recent years have witnessed significant progressive evolution in the field, particularly regarding the continuing elaboration of detailed rules and supporting methodologies for the conservation of watercourse ecosystems.[xxiii] Though the 1992 UNECE Water Convention and the 1997 UN Watercourses Convention both included express obligations to protect watercourse ecosystems, this commitment was largely aspirational, and its normative implications were but poorly understood. In the meantime, however, ever greater scientific understanding of how 'the use of watercourses can affect and be affected by processes related to other natural elements, such as soil degradation and desertification, deforestation and climate change', has led key actors to advocate and adopt a so-called "ecosystem approach",[xxiv] which stresses interconnectedness between living species and their physical environments and implies holistic, spatially expansive management approaches recognising the need to maintain 'ecosystem integrity'.[xxv] This evolution in scientific understanding of river basins as ecosystems continues, as reflected in the emergence of sophisticated methodologies which function to inform the normative implications of State obligations to protect watercourse ecosystems. For example, improved techniques for analysing environmental flows in a shared watercourse have allowed judicial recognition of a corresponding legal obligation to maintain a minimum environmental flow regime,[xxvi] and judicial confirmation that interference with the minimum environmental flow of an international watercourse may now be regarded as significant transboundary harm.[xxvii] Similarly, the rapidly evolving ecosystem services concept provides a methodological framework for the economic and social valuation of natural ecosystems and the services provided thereby, permitting integration of both marketable and non-marketable watercourse-related benefits into decision-making processes regarding water utilisation. Indeed, the International Court of Justice (ICJ) has recently determined that 'damage to the environment, and *the consequent impairment or loss of the ability of the environment to provide goods and services*, is compensable under international law'.[xxviii] In addition, lessons learned in the implementation of related environmental regimes may also inform obligations regarding international watercourse ecosystems. For example, detailed guidance developed under the 1971 Ramsar Convention[xxix] can assist in informing the ecosystem obligations arising in international water law, as wetlands play a critical role in the functioning of aquatic ecosystems and the provision of important ecosystem services, such as water resources retention and purification, food provision, flood control, wildlife habitat and groundwater recharge.[xxx] Notwithstanding such progress, however, the challenge of protecting and preserving international watercourse ecosystems has served to highlight further the deficiencies of international water law and its inadequacy for addressing the looming global water crisis.

4. Systemic Deficiencies in International Water Law

Despite broad consensus on the key principles and approaches set out under international water law, it has long been clear that this body of rules suffers from systemic shortcomings which limit its current effectiveness in determining each State's entitlement to the benefits of the watercourse and the standard of State behaviour expected. These shortcomings, which are also likely to limit the utility of international water law in addressing the looming water crisis, include its limited incorporation into and lack of coherence with national legal frameworks and its general lack of effective enforceability. However, the key difficulty with international water law is that of its normative indeterminacy, as 'specific mechanisms for operationalization remain sparse and the provisions themselves are vague'.[xxxi] Though equitable and reasonable utilisation requires consideration of an open-ended list of relevant factors, '[t]he weight of the factors is somewhat elusive: there is no hierarchical list to be considered and no consensus on where to focus greater weight',[xxxii] so that this key principle 'is thus prone to subjective interpretation'.[xxxiii] Therefore, consistent with the UN Watercourses Convention's role as a framework convention, 'the operationalization of Article 6 [listing the factors relevant to equitable and reasonable utilisation] relies on a deliberative process by each state to establish "importance" and "weight".'[xxxiv] To add to this uncertainty regarding the relative significance of each relevant factor, it is clear that they

> 'cannot be treated as definitive and considered in isolation from all other aspects of governance, they must be used in the context of the watercourse, the prevailing situation of concerned riparians and their populations, and in harmony with other law and policy frameworks to adapt to the context of the watercourse in which they are being applied.'[xxxv]

Similar uncertainty afflicts the generally applicable obligation for watercourse States to 'take all appropriate measures to prevent the causing of significant harm to other watercourse States'.[xxxvi] Not alone is there continuing disagreement and confusion amongst State actors regarding the normative implications of its purported subordination to the principle of equitable and reasonable utilisation,[xxxvii] but both the significance threshold for harm coming within the scope of the no-harm rule and the due diligence standard of conducted expected of watercourse States thereunder are understood to be highly context-related.[xxxviii] Even if one accepts that such due diligence is linked to equitable and reasonable use, so that the normative implications of the prohibition on causing significant harm must be understood taking account of the factors listed as relevant to equitable and reasonable utilisation,[xxxix] the duty of prevention remains subject to the normative uncertainty inherent to these factors.

Therefore, the basic principles outlined above provide little more than a foundation for the development of more elaborate, basin-specific substantive and procedural frameworks for cooperation, ideally through the conclusion of watercourse agreements which accommodate the particular geophysical, political, social, economic and environmental characteristics of each basin.[xl] Unfortunately, not all watercourses are covered by such basin-level agreements and, even where they do exist, not all riparian States see any advantage in acceding thereto. Indeed, whereas the benefits of closer basin-level cooperation and resulting water resources optimisation ought to be ever more apparent, the number of watercourse agreements concluded by basin States has slowed sharply in recent years.[xli] This lack of legal certainty and predictability undermines the authority of international water law, so that watercourse States often act unilaterally in the pursuit of their own short-term and narrowly self-interested

sovereign objectives. As one commentator points out, '[t]he most powerful riparians are often willing to take unilateral action, as the risk that their action will be subsequently found inequitable and unreasonable is rather low'.[xlii] Thus, normative uncertainty provides the vacuum within which narrow considerations of sovereignty tend to arise and thrive in transboundary water management, thereby undermining the development or implementation of further, more elaborate rules of cooperation. In this way 'many international water treaties remain dead-letter regimes – in some cases negotiated with good intentions, but ineffective in reality'.[xliii] This problem can be illustrated by a brief examination of three key areas in which current international water law and practice is found to be wanting.

4.1 Benefit-Sharing

Normative uncertainty has severely hindered the development and adoption by basin States of broad-based, cross-sectoral benefit-sharing arrangements, which would otherwise offer a potential means of reconciling upstream and downstream positions, as well as other conflicting interests in the use of shared waters. Benefit-sharing may be defined to include 'any action designed to change the allocation of costs and benefits associated with cooperation' which, in most cases, 'will require some form of redistribution or compensation'.[xliv] Benefit-sharing arrangements would typically involve some form of payments for benefits, or compensation for costs, associated with enhanced stewardship of a shared transboundary watercourse normally undertaken by an upstream state. In the vast majority of situations where the simple allocation of a quantum share of water would prove inefficient or otherwise inappropriate, benefit-sharing arrangements might permit riparian States to cooperate in taking a basin-wide approach in order to optimize benefits and allocate costs, by providing a framework for the equitable sharing of those benefits and costs. By facilitating broad issue-linkage, such arrangements can greatly enhance the range and scope of cooperative initiatives in which states might engage. In addition to benefits directly connected to water resources utilisation, such as irrigated food production or hydropower generation, benefit-sharing arrangements might also take account of benefits not directly related to water use. They would generally aim to optimise beneficial water use so as to maximise welfare and facilitate sustainable utilisation and equitable sharing of water-related benefits.[xlv] In other words, benefit-sharing 'enlarges the pie',[xlvi] aiming at 'the achievement of regional water security through cost-sharing rather than inefficient duplicate development'.[xlvii]

One might reasonably expect that the emergence of widely accepted methodologies regarding the identification and valuation of ecosystem services would support greater resort to benefit-sharing, particularly by means of arrangements designed to optimise the mutual benefit enjoyed by watercourse States through the preservation of watercourse ecosystems and the maintenance of the services provided thereby. However, this does not appear to be occurring. Due to the inherent complexity of the considerations and calculations involved in benefit-sharing, such arrangements require a sophisticated legal and institutional framework for cooperation.[xlviii] Strong cooperative institutions with appropriately broad mandates and adequate technical capacity can undertake cooperative regional assessments which may serve as a 'common point of departure', whilst also facilitating the intense, regular and structured exchange of data and information required 'in order to build trust and catalyse cooperation'.[xlix] Research suggests that failure to agree and implement benefit sharing arrangements in opportune situations can often be blamed largely on the lack of appropriate binding legal and competent institutional arrangements.[l] Nevertheless, watercourse States have consistently proven reluctant to establish such strong institutions, lest this might limit their sovereign freedom of action regarding shared water resources, and so successful examples of benefit-sharing remain few and far between.[li]

Thus, while the principle of equitable and reasonable utilisation is sufficiently flexible to accommodate, and may in certain circumstances even require, sophisticated benefit-sharing amongst watercourse States, its inherent normative uncertainty serves to amplify States' sovereign reluctance to cooperate and, thereby, to discourage such arrangements which might otherwise maximise efficiency and optimise overall beneficial use of shared waters.[lii] As problems of water scarcity and ecosystems degradation intensify, this situation will become increasingly untenable.

It is quite clear that the difficult task of crafting complex benefit-sharing arrangements, as well as their effective implementation and management over time, will require a regime of ongoing intense and highly technical inter-State engagement which is utterly beyond the capacity of the procedural rules and institutional structures currently found in international water law. 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.[liii]

4.2 Adaptive Management

Similarly, international water law appears ill suited to employ adaptive management techniques in order to respond to the challenges presented by climate change, as well as to the ongoing problem of biodiversity loss.[liv] Adaptive management is one of the key mechanisms for implementing an ecosystem approach and involves a strategy that is 'iterative and flexible, responsive to the constantly changing conditions of both complex ecosystem processes and available scientific knowledge'.[lv] 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.[lvi] One can 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.[lvii] 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 system',[lviii] by adopting a systematic approach for adapting and improving natural resources management by learning from previous management interventions.[lix]

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 broadly mandated joint institutions that would necessarily be charged with implementing adaptive management.[lx] 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',[lxi] something that is not often afforded to cooperative transboundary institutions (where they exist) by watercourse States concerned to maintain sovereign freedom of action.

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.[lxii] It is quite clear that the outcomes traditionally produced by inter-State procedural engagement in respect of 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 critically significant role played in the effective implementation of such procedural engagement (and, by extension, in giving effect to the substantive rules of international water law) 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.[lxiii] 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'.[lxiv]

Though this will inevitably present significant challenges for the procedural and institutional arrangements currently prevailing in international water law, the requirement for adaptive governance aiming to ensure ecological resilience is not without some legal authority. Strong links exist between adaptive management and the precautionary principle, as both seek to accommodate scientific uncertainty,[lxv] and the former can be regarded as a means of implementing the latter,[lxvi] which enjoys extensive support as customary law.[lxvii] The inverse is also true, as precaution is central to implementation of any adaptive management technique. 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.[lxviii] Of course, the ecosystem approach may already enjoy autonomous legal authority, at least in the field of international watercourses.[lxix] Consistent ICJ endorsement in transboundary watercourses cases of a requirement for 'continuing' environmental assessment might amount to judicial recognition of the important role of adaptive ecosystem-based management in certain situations of scientific uncertainty. The Court stated unequivocally in *Pulp Mills* 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',[lxx] thereby building upon Judge Weeramantry's earlier endorsement in *Gabčíkovo-Nagymaros* of the "Principle of Continuing Environmental Impact Assessment".[lxxi]

Broad Stakeholder Participation

Though Rio Principle 10 proclaims a general principle of public participation,[lxxii] which is equally applicable to the management of shared transboundary water resources[lxxiii] and might reasonably be considered to reflect established customary international law,[lxxiv] 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 developments in general international law. For example, Article 13 of the International Law Commission (ILC) 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 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'.[lxxv]

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.[lxxvi] 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 regarded as 'arguably leading the charge on producing instruments which strengthen joint institutions and stakeholder participation',[lxxvii] the Convention itself only requires State parties to make information relating to the management of transboundary freshwater resources available to the public and says little about public participation.[lxxviii] Some European basin agreements inspired by the UNECE Water Convention have tended to take a similarly restrictive approach as regards public or stakeholder participation,[lxxix] whilst others have sought to be more inclusive.[lxxx] There also exists 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[lxxxi] and the 2003 Lake Tanganyika Convention.[lxxxii]

Public participation is clearly recognised as central to effective implementation of the ecosystem approach in the practice guidance developed under the Convention on Biological Diversity (CBD). Of the 12 principles identified at 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.[lxxxiii] Similarly, Goal 2.5 of the CBD's Revised Programme of Work on Inland Water Biological Diversity recommends broad engagement with '[r]elevant national stakeholders, including representatives of indigenous and local communities'.[lxxxiv] 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'.[lxxxv]

It is worth noting, however, that, despite a dearth of treaty provisions expressly providing for public participation in respect of shared international waters, many treaty regimes either require[lxxxvi] or promote[lxxxvii] reliance upon EIA of planned projects in order to avoid and minimise adverse impacts and facilitate meaningful inter-State notification, as is now a 'requirement under general international law'[lxxxviii] irrespective of its inclusion in an applicable conventional instrument, though the ICJ found that 'no legal obligation to consult the affected populations arises for the Parties from the instruments invoked by Argentina'.[lxxxix] However, the Court 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'[xc] and one would struggle to find a national EIA regime where public or stakeholder participation is not a central

element. It is telling that the 1991 UNECE Convention on Transboundary Environmental Impact Assessment, which is intended to inform national development 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'.[xci]

Of course, a significant number of international watercourses have in place permanent institutional structures, which may assist in facilitating structured stakeholder engagement. One commentator suggests that 'practice shows that effective institutional management has a degree of flexibility that allows for public input'.[xcii] A comprehensive 2013 study of water-related institutional cooperation 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'.[xciii] This is particularly important for effective ecosystems protection, for which

> '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.'[xciv]

However, if effective public or stakeholder participation is crucial for the protection of watercourse ecosystems, and for addressing the impacts of climate change, it is thus crucial for achieving optimal and sustainable utilisation of international watercourses. It follows that is also critically important for the avoidance or resolution of international water disputes. Therefore, it is quite clear that the prevailing formal paradigm for procedural engagement in international water law, with its almost exclusive focus on inter-State communication, is not fit for purpose. Discussing the 'Effectiveness of Public Participation in Decision Making' regarding shared international water resources, the chapter contained in the Millennium Ecosystem Assessment on 'Freshwater Ecosystems' provides an indication of the inherent complexity of the participation issues potentially arising:

> '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 stakeholder s.[xcv]

While participatory rights are developing rapidly within the related fields of human rights law[xcvi] and environmental law,[xcvii] 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.

5. Conclusion

The emerging challenges of the growing global water crisis were always likely to have profound implications for the structure and composition of international water law, which has until relatively recently served primarily to accommodate competing economic uses of shared international freshwater resources. It is increasingly clear that wide-ranging ecosystems obligations will play a critical role in addressing such challenges and, as the normative parameters of applying an ecosystem approach to transboundary water management continue to take shape, the true nature of these implications are unfolding. Though the indeterminate substantive rules of international water law, encompassing both the principle of equitable and reasonable utilisation and the duty to prevent significant transboundary harm, appear to enjoy the flexibility to accommodate multi-faceted ecosystem concerns,[xcviii] the related procedural rules and institutional arrangements may struggle in this regard. While the detailed procedural rules set out in the 1997 UN Watercourses Convention are commonly regarded as the Convention's crowning achievement, it appears that the emerging technical approaches and methodologies, which provide the ecosystem approach with normative meaning and facilitate its practical implementation in the specific context of shared waters, represent a significant challenge to established patterns of inter-State communication and engagement.

Firstly, the requirement to adopt a precautionary ecosystem approach incorporating elements of adaptive management will be necessary in order to respond to the threat of climate change, to ever greater pressure upon watercourse ecosystems, and to improving scientific understanding of ecosystem dynamics and vulnerability. This will require watercourse States to engage cooperatively in continuing environmental impact assessment, experimentation and monitoring, suggesting the need for much more sophisticated and intense inter-State procedural engagement, to ensure 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 towards procedural frameworks that ensure meaningful engagement with key stakeholders and the public. The modalities of such consultation are very much more complex, particularly at the transboundary level, and appropriate procedural frameworks will require a sophisticated approach, learned from fields such as human rights, to ensure open and equitable 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 benefit-sharing in the cooperative management of shared water resources. Such arrangements will also demand a sophistication in the supporting rules and mechanisms for procedural engagement 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 resolve the international water-related

disputes likely to arise in an increasingly water-scarce world. However, its effective deployment will require significant upgrading of the supporting procedural rules of international water law. In addition, truly robust river basin institutions have a pivotal role to play, as only these can initiate and foster the deep cooperative practice amongst States needed to provide the requisite degree of normative clarity through *de facto* elaboration of the key principles of international water law.

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[i] International Law Association, 1966 Helsinki Rules on the Uses of the Waters of International Rivers, *Report of the Fifty-Second Conference* (ILA, London, 1967) 484-532.
[ii] Most notably the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention), (1997) 36 ILM 700.
[iii] This is apparent from the commentary to the International Law Commission's (ILC) 1994 Draft Articles on the Law of the Non-Navigational Uses of International Watercourses, which formed the basis for the 1997 UN Watercourses Convention: https://legal.un.org/ilc/texts/instruments/english/commentaries/8_3_1994.pdf On the codification work of the International Law Association in this area, see S. Bogdanovich, *International Law of Water Resources: Contribution of the International Law Association (1954-2000)* (Kluwer Law International, The Hague, 2001).
[iv] E. Brown Weiss, *International Law for a Water-Scarce World* (Martinus Nijhoff, Leiden, 2013), at 1.
[v] For example, one 2009 study anticipates a deficit of over 1,600 billion cubic metres by 2030. See 2030 Water Resources Group, *Charting Our Water Future* (World Bank Group, Washington D.C., 2009), at 6-7, cited by Brown Weiss, *ibid*., at 6.
[vi] S. Brels, D. Coates and F. Loures, *Transboundary Water Resources Management: The Role of International Watercourse Agreements in Implementation of the CBD* (Secretariat of the CBD, 2008), at 5.
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[ix] Brown Weiss, supra, n. iv, at 9.
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[xxv] J. Brunnée and S.J. Toope, 'Environmental Security and Freshwater Resources: A case for International Ecosystem Law', (1994) 5 *Yearbook of International Environmental Law* 41-76, at 55.
[xxvi] Permanent Court of Arbitration (PCA), *Indus Waters Kishenganga Arbitration (Pakistan v. India),* Partial Award, 18 February 2013, at para. 454.
[xxvii] International Court of Justice (ICJ), *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua)*, Judgment of 16 December 2015, paras. 105 and 119. See O. McIntyre, 'State Responsibility in International Law for Damage to Transboundary Freshwaters: The Emergence of a New Ecosystems-Based Paradigm?' (2020) 29/3 *Review of European, Comparative and International Environmental Law* 430-441, at 440.
[xxviii] ICJ, *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua),* Judgment of 2 February 2018 on Compensation Owed by the Republic of Nicaragua to the Republic of Costa Rica, para. 42 (emphasis added). See McIntyre, *ibid.*
[xxix] Convention on Wetlands of International Importance especially as Waterfowl habitat (as amended in 1982 and 1987), 2 February 1971, 996 UNTS 245. Today the Ramsar Convention has 171 Contracting Parties and applies to 2,414 designated wetland sites covering a total area of 254,543,972 hectares.
[xxx] Such guidance is consolidated in twenty volumes of the Ramsar *Handbooks for the Wise Use of Wetlands* (4th ed., 2010): https://www.ramsar.org/resources/the-handbooks
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[xxxii] *Ibid.,* at 15.
[xxxiii] P. Van der Zaag, I.M. Seyam and H.H.G. Savenije, 'Towards Measureable Criteria for the Equitable Sharing of International Water Resources', (2002) 4/1 *Water Policy* 19-32, at 20.
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[xxxv] *Ibid.,* at 17.
[xxxvi] UN Watercourses Convention, Article 7(1).
[xxxvii] Salman, *supra,* n. xi, at 95-96 and 114-115; McIntyre, *supra,* n. xxii, at 104-116.
[xxxviii] McIntyre, *supra,* n. xi, at 609-616.
[xxxix] McIntyre, *supra,* n. xxii, at 113-116.
[xl] See further, S. Vinogradov, P. Wouters and P. Jones, *Transforming Potential Conflict into Cooperation Potential: The Role of International Water Law* (UNESCO. Paris, 2003), at 12-14.
[xli] See BO. Magsig, *International Water Law and the Quest for Common Security* (Routledge, London, 2015), at 50, citing the Transboundary Freshwater Dispute Database, maintained by Oregon State University: https://transboundarywaters.science.oregonstate.edu/content/transboundary-freshwater-dispute-database
[xlii] Magsig, *ibid.,* at 64, citing the examples of the Nile basin, Central Asia and the Tigris-Euphrates.
[xliii] *Ibid.,* at 65.

[xliv] C.W. Sadoff and D. Grey, 'Cooperation on international rivers: A continuum for securing and sharing benefits', (2005) 30/4 *Water International* 420–427, at 422.
[xlv] O. McIntyre, 'Benefit-sharing and upstream/downstream cooperation for ecological protection of transboundary waters: opportunities for China as an upstream state', (2015) 40/1 *Water International* 48-70.
[xlvi] Sadoff and Grey, supra, n. xliv, at 423.
[xlvii] A.D. Tarlock and P. Wouters, 'Are shared benefits of international waters an equitable apportionment?', (2007) 18/3 *Colorado Journal of International Environmental Law and Policy* 523–536, at 533.
[xlviii] R. Paisley, 'Adversaries into partners: International water law and the equitable sharing of downstream benefits', (2002) 3 *Melbourne Journal of International Law* 280–300, at 288-289 and 299.
[xlix] Sadoff and Grey, supra, n. xliv, at 425-426.
[l] See Tarlock and Wouters, *supra*, n. xlvii, at 532, examining the problems experienced in attempts to introduce benefit-sharing in the Amu Darya and Syr Darya basins in Central Asia. See further, I. Soliev and I. Theesfeld, 'Benefit Sharing for Solving Transboundary Commons Dilemma in Central Asia', (2020) 14/1 *International Journal of the Commons* 61-77.
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[lii] McIntyre, *supra,* n. xlv.
[liii] See O. McIntyre, 'Procedural Rules of International Water Law and the Imminent Challenges of the Ecosystem Approach', in H. Ruiz-Fabri, E. Franckx, M. Benatar and T. Meshel (eds.), *A Bridge Over Troubled Waters: Dispute Resolution in the Law of International Watercourses and the Law of the Sea* (Brill, Leiden, 2020) 319-350, at 342-345.
[liv] *Ibid.,* at 334-337.
[lv] V. De Lucia, 'Competing narratives and Complex Genealogies: The Ecosystem Approach in International Environmental Law', (2015) 27/1 *Journal of Environmental Law* 91-117, at 93.
[lvi] E. Raitanen, 'Legal Weaknesses and Windows of Opportunity in Transnational Biodiversity Protection: As Seen Through the Lens of an Ecosystem Approach-Based Paradigm' in S. Maljean-Dubois (ed.), *The Effectiveness of International Law* (Intersentia, Cambridge, 2017) 81-100, at 93.
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[lix] B.K. Williams, 'Adaptive Management of Natural Resources: Frameworks and Issues' (2011) 92/5 *Journal of Environmental Management* 1346–1353.
[lx] See M. Lim, 'Is Water Different from Biodiversity? Governance Criteria for the Effective Management of Transboundary Resources' (2014) 23/1 *Review of European, Comparative and International Environmental Law* 96–110. See further A.D. Tarlock, 'Four Challenges of International Water Law' (2010) 23 *Tulane Environmental Law Journal* 369-408, at 383–384.
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[lxii] Exemplified by the detailed provisions contained in Part III of the UN Watercourses Convention.
[lxiii] ICJ, *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment of 20 April 2010, *ICJ Rep. 14*, para. 204. See O. McIntyre, 'The World Court's Ongoing Contribution to International Water Law: The Pulp Mills Case between Argentina and Uruguay', (2011) 4/2 *Water Alternatives* 124-144.
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[lxv] R.K. Craig, '"Stationarity is Dead" – Long Live Transformation: Five Principles for Climate Change Adaptation Law' (2010) 34/1 *Harvard Environmental Law Review* 9-73, at 46–48.
[lxvi] Raitanen, *supra,* n. lvi, at 97.
[lxvii] See O. McIntyre and T. Mosedale, 'The Precautionary Principle as a Norm of Customary International Law' (1997) 9/2 *Journal of Environmental Law* 221–241.
[lxviii] See A. Trouwborst, 'The Precautionary Principle and the Ecosystem Approach in International Law: Differences, Similarities and Linkages', (2009) 18/1 *Review of European, Comparative and International Environmental Law* 26-37, at 26.
[lxix] *Ibid.,* at 30.
[lxx] *Supra,* n. lxiii, para. 205.
[lxxi] ICJ, *Gabčíkovo-Nagymaros Project (Hungary / Slovakia)*, [1997] *ICJ Rep*. 7, Separate Opinion of Judge Weeramantry, 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),*

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[lxxv] ILC, Report of the International Law Commission on the Work of its 53rd Session, UN Doc A/56/10, at 165. See further, O. McIntyre, 'The Proceduralisation and Growing Maturity of International Water Law' (2011) 22/3 *Journal of Environmental Law* 475-497, at 496–497.
[lxxvi] Articles 11-19.
[lxxvii] R. Moynihan, 'Inland water biodiversity: international law on protection of transboundary freshwater ecosystems and biodiversity' in E. Morgera and J. Razzaque (eds.), *Biodiversity and Nature Protection Law* (Edward Elgar, Cheltenham, 2017) 189-202, at 200. See further, R. Moynihan and BO. Magsig, 'The Rising Role of Regional Approaches in International Water Law: Lessons from the UNECE Water Regime and Himalayan Asia for Strengthening Transboundary Water Cooperation' (2014) 23/1 *Review of European, Comparative and International Environmental Law* 43–58.
[lxxviii] Convention on the Protection and Use of Transboundary Watercourses and International Lakes, (1992) 1507 *UNTS* 167, Article 16.
[lxxix] Convention on Cooperation for the Protection and Sustainable Use of the Danube River (Sophia, 29 June 1994), Article 14.
[lxxx] Article 14 of the Convention on the Protection of the Rhine (Bern, 12 April 1999) provides for NGOs to act as observers, make submissions and enter into consultations with the Commission.
[lxxxi] Agreement on the Establishment of the Zambezi Water Commission (Kasane, 13 July 2004), Article 16(8).
[lxxxii] Convention on Sustainable Management of Lake Tanganyika (Dar es Salaam, 12 June 2003), Articles 5(2)(d) and 17.
[lxxxiii] CBD Decision V/6, Ecosystem Approach (22 June 2000), UN Doc UNEP/CBD/COP/5/23.
[lxxxiv] CBD Decision VII/4 (13 April 2004), Annex, at 22.
[lxxxv] CBD Decision VII/11 (13 April 2004) 2, para 10, UN Doc UNEP/CBD/COP.7/21.
[lxxxvi] Lake Tanganyika Convention, *supra,* n. lxxxii, Article 15.
[lxxxvii] UN Watercourses Convention, Article 12; ILC Draft Articles on Transboundary Aquifers, Article 15(2), Report of the International Law Commission on the Work of Its Sixtieth Session, II(2) *Yearbook of the International Law Commission* (2008).
[lxxxviii] *Pulp Mills, supra,* n. lxiii, para. 204.
[lxxxix] *Ibid.,* para. 216.
[xc] *Ibid*., para. 205.
[xci] Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 25 February 1991) 1989 UNTS 309. The activities listed in Appendix I to the Convention as requiring EIA 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 significant impact upon a watercourse.
[xcii] Lim, *supra,* n. lx, at 104.
[xciii] Schmeier, *supra,* n. xxi, at 108.
[xciv] A. Rieu-Clarke and C. Spray, 'Ecosystem Services and International Water Law: Towards a More Effective Determination and Implementation of Equity', (2013) 16/2 *Potchefstroom Electronic Law Journal* 11-65, at 46.
[xcv] B. Aylward *et al, Millennium Ecosystem Assessment,* Chapter 7 – Freshwater Ecosystem Services 213-255, at 227, available at https://www.millenniumassessment.org/documents/document.312.aspx.pdf
[xcvi] Rieu-Clarke and Spray, *supra,* n. xciv, at 48. See further O. McIntyre, 'The Role of the Public and the Human Right to Water' in M. Tignino and K. Sangbana (eds.), *Public Participation and Water Resources Management: Where Do We Stand in International Law?* (UNESCO, PARIS, 2015) 139–146.
[xcvii] 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); Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú, 4 March 2018), not yet in force.

[xcviii] See O. McIntyre, 'Substantive Rules of International Water Law' in A. Rieu-Clarke, A. Allen and S. Hendry (eds.), *Routledge Handbook of Water Law and Policy* (Routledge, London, 2017) 234–246.