Sustainable Freshwater Management –

Where's the Magic?

A global perspective on the challenges and opportunities associated with the management of freshwater resources highlighting New Zealand's unique contribution

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Freshwater is a finite resource, and its sustained availability is one of the most critical modern challenges facing people and the environment globally (UNEP, 2010). The IPCC report on Climate and Water states that changes in water quantity and quality due to climate change would affect food availability, stability, access, and use, leading to decreased food security. Accomplishing this goal of a water-secure world poses huge challenges, especially as competition for water increases, and given the complexity of managing international fresh water systems. New Zealand — as part of the Asia Pacific region, where future water security is uncertain, must take steps to ensure the sustainable management of its water resources, particularly in light of the future challenges surrounding virtual water and regional water security. Public international water law plays a role in assisting national governments (as the key actors in international relations) to move towards water security, and this is true particularly in the case of international transboundary watercourses. The existence of a strong body of international rules to sustainably manage transboundary waters is also beneficial to geographically isolated nations such as New Zealand and the nation has a role to play in supporting the development of these rules, especially during a period of national water reform. New Zealand has signed a number of international agreements and subscribed to international policies which have placed obligations upon it to ensure sustainably manage its waters. As a member of the international community and with its specialized expertise in water resources management, New Zealand could contribute to achieving the ideals found in the UN Charter – the promotion of regional peace and security and the fundamental freedoms of all – through, in part, its expertise in the management of freshwater. New Zealand has much to offer – and so, the crucial question of this important conference is -- where is the magic?

This paper is a work-in-progress and presented here as a discussion paper in support of Professor Patricia Wouters participation the RMLA Conference 2010 – Sustainable Freshwater Management - Are we there yet? (30 Sept / 2 October 2010, Christchurch Convention Centre).

GLOBAL WATER CHALLENGE

Freshwater is a finite resource, and its sustained availability is one of the most critical modern challenges facing people and the environment globally (UNEP, 2010).[1] Of the 1.4 billion cubic kilometers of water found on Earth, only 2.5%, approximately 37 million cubic kilometres, constitutes freshwater, and 90 percent of this is locked up in polar ice caps and groundwater reservoirs which are presently inaccessible. What is left to sustain humanity and the environment is 4.3 million cubic kilometres of accessible groundwater and only 127,300 cubic kilometres of surface water (UNEP, 2010). At the global level, there is currently a 40 per cent gap between the amount of water now available and the amount of water that will be needed in 2030 for aggregate food production, energy, municipal and industrial goals (McKinsey Report 2010). This is a perilous situation — acute shortages will emerge even if ecosystem water needs are not taken into account (Hashimoto Action Plan II Feb. 2010).[2]

The IPCC 'Climate Change and Water Report' (Bates *et al.*, 2008)[3] presents a series of water models that project serious shortages of water in semi-arid regions of the world including Australia, southern Africa, Central America, the Caribbean, south-western South America, south-western United States, and the Mediterranean, resulting from increased frequencies of droughts and water scarcity over the next 50–100 years. In Latin America, especially in the arid and semi-arid parts of Argentina, Chile, and Brazil, any future reductions in rainfall are likely to lead to severe water shortages; Bolivia, Colombia, Ecuador, and Peru will experience reduced hydropower capacity as a result of glacier shrinkage. Severe water stress already affects eastern Central America, Guatemala, Mexico, El Salvador, Costa Rica, Honduras, and Panama. In Europe, future water trends forecast extreme winter precipitation, with millions of additional people living in water-stressed watersheds in 17 countries in Western Europe, and reduced hydropower potential across Europe, with a 20–50 percent decrease in the Mediterranean region alone (Bates *et al*., 2008: 129). The ability of six billion people, rising to over nine billion by 2050, to thrive let alone survive will depend in no small part on how freshwater resources are managed over the coming years and decades (UNEP, 2010).

One of the overall conclusions of the IPCC report on Climate and Water was that changes in water quantity and quality due to climate change would affect food availability, stability, access, and use, leading to decreased food security. This sectoral cross-over was highlighted again in the IPCC finding that water resources management clearly impacts on many other policy areas such as energy, health, food, socio-economic matters, and nature conservation. The IPCC survey indicates an emergent global water crisis and illustrates how it cuts across political and socio-economic domains, scientific disciplines, and national sovereign boundaries.

Regional Water Challenge

Even isolated island nations with relative freshwater abundance such as New Zealand are experiencing issues of water scarcity and water security. Although New Zealand has more freshwater per capita than 90 percent of countries around the world, increasing demands, particularly for irrigation, have led to the situation where in some districts demand exceeds the available and sustainable supply. It has been estimated that by 2012, all the available freshwater resources in New Zealand's most economically significant regions will be fully allocated to users. New Zealand is also heavily dependent on the import of water intensive commodities from around the world, particularly goods from the Asia Pacific Region most notably China, Australia and Japan. The future water security of this region is uncertain.

The Asia-Pacific region is home to the majority of the world's poor. One in five people do not have access to safe water supply (Asian Development Bank, 2010).[4] In North East Asia, there are major transboundary water issues relating to allocation, flooding and droughts. Hydro-electric potential is also a central concern, as is the management of quickly disappearing aquifers, and adversely affected ecosystems, caused by a number of causes, including glacier melts due to climate change. At the Asia Pacific Water Forum held earlier this year, the Asian Development Bank (ADB) stated that water security would be a top priority for the region during 2010 and very recently, the President of the ADB, Haruhiko Kuroda called for concerted action to achieve the Millennium Development Goals, stating that enhanced regional collaboration is necessary to achieve these goals.
In Australia, ongoing water security problems are very likely to increase by 2030 in southern and eastern Australia. The annual stream flow of the Murray-Darling Basin, Australia's largest river basin, accounting for about 70% of irrigated crops and pastures, is projected to fall 10–25% by 2050 and farming of marginal land in drier regions is likely to become unsustainable due to water shortages (Bates *et al.*, 2008).

Exploring the ever increasing international dependence and interconnectedness between water, food, energy and security will assist legislators, policymakers, the judiciary, lawyers and scientists to acknowledge that New Zealand will be affected by the global water crisis, just as it has been affected by the global financial crisis. Finding sustainable solutions will require a global and national multi-sectoral approach.

Current Global Insights in Advisory Role

- Asian Development Bank (Manila) Governance framework, UN governance, state sovereignty, rule of law and role of RBOs

- Xiamen Asian Academy – overview of transboundary water law issues across Asia
- Global Water Partnership (TEC member), reflections post GWP Stockholm meeting
- World Economic Forum (Global Agenda Council on Water Security)

WATER SECURITY, IWRM and VIRTUAL WATER

Integrated water resources management (IWRM) continues to guide water management at a local level in countries all over the world. IWRM which, although not capable of exhaustive definition or prescription (GWP, 2000a; Lenton and Muller, 2009)[5], is correctly identified as a process to achieve sustainable water use and sustainable water resource systems. Water Law in New Zealand includes many of the key tenets of IWRM through the existing legislative framework of the 1991 Resource Management Act and also the recently initiated New Zealand Government's New Start for Freshwater (NSFW) strategy.

One of the desired outcomes of IWRM, which is not yet conceptualized in New Zealand's framework for water management is the outcome of achieving water security – i.e. the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, the environment and economies. It is the thread that links together the diverse challenges facing the world in food, energy, climate, economic growth and human security (Global Water Partnership, 2010).[6]

There are two levels of water security: local water security and global water security. Local water security is the security of communities, economies and regions—the security of local access to a resource. Part of the solution to local water security is virtual water that is importing virtual water embedded in water intensive commodities. Since about 1970, all the Middle East and North African region has depended on such trade (T. Allan, 2009). However, it is important to note that trading 'virtual water' presents its own set of challenges (including trade inequities) and is therefore only part of the solution. Understanding virtual water will help New Zealand more sustainably manage its water resources.

The second type of water security is water security at the global level and is linked with national security issues, i.e. the need for national states to ensure access to this precious resource. The volume needed by the global future population of about nine billion will be 9000 billion cubic meters per year. Water

surplus countries like New Zealand could position itself meet the needs of water deficit regions through trade in water intensive commodities.

Global trade in bulk water is gaining momentum, including the shipping of water in tankers across the ocean. There is much disagreement as to whether this is actually a sustainable way to manage the world's water resources, however, New Zealand has very recently been signaled as a major potential regional supplier of bulk freshwater. George Paterson, chief executive of Aquazeal, a New Zealand company with water rights for export, is inviting investors to seriously consider the relative advantages of bulk water export from New Zealand into the Persian Gulf. This company advertises itself as having secured long term resource consents to take and use water at three locations in the South Island in order to provide a reliable supply of bulk water to interested foreign investors.

Accomplishing this goal of a water-secure world poses huge challenges, especially as competition for diminishing quantities and qualities of fresh water increases, and given the complexity of managing international fresh water systems. Public international water law plays a role in assisting national governments (as the key actors in international relations) to move towards water security, and this is true particularly in the case of international transboundary watercourses. However, the existence of a strong body of rules to sustainably manage international transboundary waters is also beneficial to geographically isolated nations such as New Zealand. And, more importantly, New Zealand has an important role to play in supporting the development of these rules as is demonstrated below.

INTERNATIONAL WATER LAW

International water law finds its foundation within the rules of public international law, and thus is intertwined with those ideals contained in the UN Charter -- maintaining international peace and security, enhancing regional cooperation, preventing threats to the peace, and advancing the fundamental freedoms of all (UN Charter).

International watercourses law provides a framework for managing the sustainability of transboundary waters that cross national borders and has evolved through a combination of customary law (state practice) and the codification and progressive development efforts undertaken by the UN, non-governmental organisations, private institutions, national and international judicial decisions, and the resolutions and recommendations of international organizations.

States, as sovereign entities, invoke three theories in support of their right to use the waters of an international watercourse crossing their territory. These theories include: absolute territorial sovereignty (a state can use the water within its territory without regard to other watercourse states); absolute territorial integrity (a state is entitled to the undiminished and unaltered natural flows into its territory); and limited territorial sovereignty (a state's entitlement to use the waters of an international watercourse is limited by the same rights and obligations of co-riparian states). Most states that have entered into agreements relating to international watercourses have embraced this latter theory as the basis for their cooperation (Wouters, 1997). It is from this origin that the principle of equitable utilization has emerged as the governing rule in this field, directing that each watercourse state is entitled and obliged to utilize an international watercourse in an equitable and reasonable way.

Responding to a request from member states in the United Nations (UN) General Assembly (GA), the UN GA, in 1971, asked the UN International Law Commission (ILC) to undertake a study on the law of the non-navigational uses of international watercourses, with a view to its progressive development and codification. A consolidated draft document containing some 37 provisions was produced by the ILC following close to 3 decades of study and debate. This instrument formed the foundation for the only framework treaty on the topic, the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (UN WC), which was adopted by UN resolution on 23 May 1997. The Convention was endorsed in the UN GA by 104 States and requires 35 States to allow it to enter into force. As of September 2010, nineteen States have endorsed the UN WC (Finland, Germany, Guinea-Bissau, Hungary, Iraq, Jordan, Lebanon, Libya, Namibia, Netherlands, Norway, Portugal, Qatar, South Africa, Spain, Sweden, Syria, Tunisia, and Uzbekistan) and an additional five are signatories (Cote d'Ivore, Luxembourg, Paraguay, Venezuela, and Yemen). Thus, at present, the UN WC requires 16 more States to become party, before it enters into force (i.e. has full legal force for the States party to the UN WC). The UN WC is now the subject of an international campaign launched by the World Wildlife Fund to promote it as a global instrument that would enhance the cooperative and peaceful development of the world's international watercourses, with support especially for the weakest watercourse states. As a result, several States have moved forward with their efforts, including most recently Nigeria.

The rules of international law that have evolved over the past decades now comprise an identifiable corpus of substantive and procedural norms; from a legal perspective transboundary watercourse regimes can best be understood using the following five elements for analysis: (i) *scope* (what water resources / parties are covered?); (ii) *substantive rules* (what rules determine the lawfulness of use?); (iii) *procedural rules* (what process is to be followed for new or changed uses?); (iv) *institutional mechanisms* (what organ / governance structure is in place to implement the agreement?); (v) *dispute settlement* (what procedures apply where disputes arise?) (Wouters et al. 2005). This analytical

framework is a powerful tool for the overall assessment of transboundary watercourse regimes, identifying the important legal issues to be addressed in any particular case.

Under 'scope', the legal question to be answered relates to the reach of the regime: what waters and resources are covered; what parties are legally bound? This defines the legal reach of the regime, something that requires careful attention, but which is quite complex.

Substantive rules are those that define the legality of existing or new uses (planned measures). The question central to this topic is: what determines the lawfulness of new or increased uses of transboundary waters? The rules of international law in this area are clear, both in terms of customary international law and treaty law: international (transboundary) watercourse states are entitled (and obliged) to an 'equitable and reasonable use' of their shared water resources.

Procedural rules provide the means through which the substantive rules are implemented and provide a framework for the ongoing peaceful management of the watercourse regime. Although these rules are process-oriented, in a legal sense they represent rule of international law, the breach of which will result in state responsibility, with the attendant repercussions.

Institutional mechanisms such as international watercourse joint bodies and commissions, or meetings of the parties, are an essential component of many modern watercourse agreements, and often act as implementing agents for issues related to scope, substantive rules, procedural rules, and dispute settlement. From a legal perspective, the critical issues in this area relate to the remit and mandate of the institutional mechanism – what powers or authority have sovereign nations devolved to these bodies.

Dispute settlement mechanisms represent the logical compliance component of the transboundary watercourse regime and serve to ensure the peaceful implementation of agreed (legal) regimes concerning international watercourses[7] through negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or alternative arrangements as agreed. It is important to note that sovereign states cannot be unilaterally forced into resolving disputes – there must be an agreement to do so. Thus, how states agree (or fail to agree) on dispute settlement mechanisms in the field of transboundary watercourses will determine to a large extent whether or not there will be compliance measures that ensure the integrity of the agreed regime.

From a legal point of view, the relative security or insecurity of a transboundary watercourse regime depends upon whether or not there is an effective system in place to ensure: (i) the *availability* of

adequate and appropriate water resources; (ii) that all users are assured equitable and reasonable *access* to use the water and related benefits; and (iii) that mechanisms are in place to *address conflicts of use* where these arise – the so-called "3-A water security analytical framework" (Wouters *et al.*, 2009)[8]. The 1997 UN Watercourses Convention provides a useful framework for addressing the water security requirements. This approach is supported also by the range of state practice (primarily treaty practice). In the global arena, the Global Water Partnership (GWP) has identified their current strategy as ensuring a "water secure world" as their objective.

NEW ZEALAND'S PLACE IN GLOBAL WATER

How is International Transboundary Water Law relevant to New Zealand?

New Zealand has an important role as a global citizen in accordance with the UN Charter Article 1 (3); 'to achieve international cooperation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting and encouraging respect for human rights and for fundamental freedoms for all'. In concert with all nation states across the globe, New Zealand is rightly placed to contribute to the realization of these higher-level objectives. In the area of water resources management, in particular, national best practice on how shared freshwaters are developed and manage serves to provide lessons learned within the international domain. One example in international water law is the identification and adoption of the governing rule of "equitable and reasonable utilisation", which evolved from national state practice within federal states (such as the USA, Germany and Italy). Given the vast spectrum of stakeholders (including the voiceless and sometimes invisible), the potential for conflicts-of-use across sectors and among and between users, is great – how has New Zealand developed practice to address this complex issue and what lessons might be shared beyond New Zealand? Of course we also look to innovations in domestic water law reform, which might support reform in other countries around the world, as appropriate. The link between national and international water law is direct and mutually reinforcing; thus, the domestic treatment of issues such as water quality and quantity, priority, allocation and ownership, cultural values and governance structures provides important entry points for the international treatment of similar and related issues.

New Zealand can benefit from increasing its commitment to the rule of law and perhaps learn lessons from international water law, which will help protect this country during a global era where "we are

living in a water bubble as unsustainable and fragile as that which precipitated the collapse in world financial markets. We are now on the verge of bankruptcy in many places with no way of paying the debt back" (World Economic Report, 2009).[9] Additionally, each nation state should contribute to improved best practice in IWRM and lessons can be learned from comparative international practice.

The notion of hydro-solidarity (based upon the community-of-interests approach in the River Oder case), supplemented by hydro-diplomacy (an extension of international law), supports the collective approach required to address basin-wide challenges in transboundary waters and aligns with the higher level objectives of the law of nations recognizing our common humanity and global inter-dependence. Recognizing that water is managed locally, but across basins and communities of stakeholders, the notion of hydro-solidarity can be best considered in this realm – making New Zealand's current examination of national practice related to sustainable freshwater management highly relevant to the global discourse.

Several compelling arguments exist as to why New Zealand, as an island nation, should support international water law, particularly the UN WC. These include: enhancing security in the region, where poor management of shared waters may exacerbate conflicts and displacement of people in Asia, especially with climate change; enhancing security in other regions where there are disagreements over management of shared rivers, where states are looking to the convention as a framework for collaboration; and supporting the implementation of the Government's foreign, environmental and aid policies and investments by strengthening governance in the countries concerned (WWF, 2009).[10]

Does New Zealand comply with other international agreements concerning the sustainable management of water?

> In the context of water and the environment, sustainable development instructs people and societies to relate to and utilize the natural environment, and especially freshwater resources, in ways that do not compromise the potential benefits ensuing to different generations of humanity (UNEP, 2010).

New Zealand is an independent sovereign state with rights of permanent sovereignty over its water resources, giving the nation control over the management of water. However, it is well accepted in international law, that sovereignty is not absolute; its limits are defined and redefined as international

law evolves (Tigerstrom, 2007, 73).[11] New Zealand has already signed a number of international agreements that address aspects of the global water challenge, which have placed obligations upon New Zealand even its capacity as an island nation, to manage water in a sustainable way and this has limited New Zealand's ability to exercise this notion of permanent sovereignty. Arguably, what is considered to be a matter of domestic law depends on the development of international law (Brownlie, 2003, 291).[12]

Following the creation of the Resource Management Act 1991, New Zealand became a founding signatory of the Rio Declaration and A21 at the 1992 Earth Summit, committing itself further to the sustainable management of freshwater. A21 delivered a broad international framework for sustainably allocating and managing freshwater. Subsequent international agreements build upon A21. Some of the most notable and recent agreements include the Johannesburg Summit, the Second UN World Water Development Report, the Millennium Development Goals (MDGs), the Hashimoto Plan of Action II and the recent UN Resolution on the Human Right to Water and Sanitation.

A recent study evaluated New Zealand's existing laws and policies against 6 principles derived from A21 and subsequent UN agreements and selected for relevance to the New Zealand context: including IWRM; appropriate level decision-making and devolution; accurate water resources data collection and assessment; treating water as an economic good; efficient and sustainable water allocation for agriculture; and water allocation for urban development, industry and municipal use are discussed and applied to the New Zealand situation. This work concludes that New Zealand's laws and policies as they currently exist, do not measure up to the key principles on the sustainable management of water as identified in A21 and subsequent UN agreements especially because it employs the First-in, First-served approach to priority of allocation. Also, the RMA offers little guidance on key water planning issues, leaving this complex task to regional councils. The case of Canterbury demonstrates that under conditions of scarcity, the framework is incapable of enabling the sustainable management of water (Moynihan, R. 2009).[13]

The prolific volume of litigation particularly the most recent Court of Appeal's decision in *Central Plains Water Trust v Synlait Limited* (CA 544/08; [2009] NZCA 609) has demonstrated the need for more certainty surrounding the priority test where there are several applications competing over one finite resource. The Government response to the Canterbury water crisis was to pass the Temporary Commissioners and Improved Water Management Act 2010 under urgency. This Act was passed in less than 48 hours and yet has wide ranging implications for water resource management under the RMA. The long term impact of the material changes is not yet known, but the explanation for the emergency nature of the legislation itself is evidence of the fact that water has not been sustainably managed in Canterbury over the past 20 years.

The New Zealand Government has acknowledged the need to strengthen its commitment to the international obligations and improve the sustainable management of its waters with the initiation of the 2004 Sustainable Water Programme of Action, the 2009 New Start for Freshwater Strategy and the phase II RMA reforms. The emergency Canterbury legislation may also create a more sustainable water future.

The Millennium Development Goals (MDGs) are the globally agreed framework to progress poverty reduction including the sustainable management of water resources. The New Zealand Government through New Zealand Aid has committed itself to making a solid contribution to the achievement of the eight MDGs by 2015. The recent UN Resolution on the Human right to Water and Sanitation and the 1997 UN WC will help achieve sustainable management of the world's water resources and New Zealand has not signed or supported either agreements. Generally there are a myriad of reasons for a nation state not signing up for international agreements and we must be careful not to generalize these in New Zealand's particular case. However, as is argued throughout this paper, there is much New Zealand can gain by joining the global community and ratifying these landmark water agreements.

Future opportunities…

On the occasion of this important conference it is hoped that we will together be able to examine openly, in the spirit of shared learning, the range of issues arising from the thorny problem of achieving sustainable freshwater management. We should aspire to identify and share the lessons learned from New Zealand and be proactive in sharing this with the global community. Contributing to the peaceful management of the world's shared waters in ways that enhance opportunities for regional peace and security and that promote the fundamental freedoms of all is our collective duty. At the same time New Zealand can benefit from creating closer links with the international water law fraternity, increasing its commitment to the rule of law and international rules which will protect this country in situations where greater size, power and influence might otherwise give control. National water law practice and the experience of nations dealing with water scarcity, feeds into this body of international rules and by being a more proactive global partner, New Zealand can tap into this knowledge chain.

Where's the magic? The magic is here… in New Zealand!

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Selected Reading List:

End-Notes

[1] UNEP (2010) The Greening of Water Law: Managing Freshwater Resources for People and the Environment, Nairobi: UN Environmental Programme.

[2] United Nations Secretary-General's Advisory Board on Water and Sanitation. (2010). Hashimoto Action Plan II: Strategy and Objectives through 2012. New York: UNSGAB.

[3] Bates, B. C. *et al* (eds)(2008) Climate Change and Water: Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat: Geneva.

[4] Asian Development Bank, (2010) Water Knowledge Center, http://www.adb.org/Water/Knowledge-Center/statistics/water-sanitation-mdgs.asp

[5] Lenton, R., & Muller, M. (Eds.) (2009). Integrated water resources management in practice - better water *management for development*. London; Sterling, VA: Earthscan.

[6] Global Water Partnership (2010) *Water Security for Development: Insights from African Partnerships in Action*. GWP, Stockholm, Sweden.

[8] Wouters, P., Vinogradov, S., & Magsig, B.-O. (2009). Water security, hydrosolidarity and international law: a river runs through it ... *Yearbook of International Environmental Law, 19*, 97-134.

[9] World Economic Forum Water Initiative (2009). Managing our future water needs for agriculture, industry, human health and the environment : The bubble is close to bursting: a forecast of the main economic and geopolitical water issues likely to arise in the world during the next two decades.

[10] Loures, F. R., Rieu-Clarke, A., & Vercambre, M.-L. (2008). Everything you need to know about the UN Watercourses Convention. Gland, Switzerland: WWF International.

[11] Tigerstrom, T. (2007). Human Security and International Law. Prospects and Problems, Oxford, London: Hart Publishing.

[12] Brownlie, I. (2003). Principles of Public International Law, 6th edn. Oxford, Oxford University Press.

[13] Moynihan, R. (2009). International Law and Policy on Water Allocation: Does New Zealand Comply? *Resource Management Journal*, November, 5.