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The Development of Legal Provisions and Measures for Preventing and Reducing Pollution to Transboundary Water Resources under the UNECE Water Convention

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1. Introduction

The need to prevent and reduce pollution from degrading freshwater resources is hardly a new concept. Certainly, measures to prevent and reduce pollution generally, along with the legal foundations and policy frameworks upon which these are built upon, have undergone a continuous evolution over the past forty years or so. All of these components and more are encapsulated in the text of the United Nations Economic Commission for Europe's (UNECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes ('UNECE Water Convention')[1] and practically implement via a range of activities within its program of work.

This chapter begins by providing an overview of the origins and evolution of measures to prevent and reduce pollution and the notable incidents and milestones which led to this. The development of key legal principles to prevent and reduce pollution, both generally but also specific to freshwater resources, particularly those that are transboundary in nature is then explained before examining how they have been translated as part of the text and activities under the UNECE Water Convention. Finally, a brief evaluation of the current status of these measures to prevent and reduce pollution from degrading freshwater resources in the UNECE region and now globally is offered.

2. Setting the scene: impetus for water pollution protection and prevention measures

Freshwater pollution is one of the most ubiquitous forms of environmental degradation. It is also one of the most significant in terms of its short and long-term impacts on aquatic ecosystems and in-turn the health of humans. Indeed, the pollution of freshwater resources is 'one of the greatest worldwide human and environmental tragedies today'[2]. A statement which demonstrates the pervasive nature of freshwater pollution is that 'studies suggest that water pollution is the leading cause of death and disease worldwide killing as many as 1.7 million people annually'.[3] Overall, it is very telling to think that 'more than one half of the world's major rivers are either heavily polluted and/or drying up in their lower reaches because of untreated effluent, overexploitation, and mismanagement'.[4]

A. International pollution incidents leading to prevention and reduction measures

Significant developments regarding measures to protect and prevent water pollution, at global, regional or national scales have generally occurred as reactions to incidents of extreme water pollution. Such incidents can range from single catastrophic pollution events or more long-term chronic, but no less catastrophic, pollution build up. One of the most notable global examples of pollution prevention and reduction measures resulting from a water pollution incident is the range of

[1] Opened for signature 17 March 1992 (entered into force 6 October 1996).
[2] United Nations Environment Programme (UNEP), 'The Greening of Water Law: Managing Freshwater Resources for People and the Environment', 2011, see: <http://www.unep.org/delc/portals/119/UNEP_Greening_water_law.pdf> accessed 1 June 2014, 48.
[3] Ibid.
[4] Ibid.

environmental protection regulations, specifically the enactment of the United States' Oil Pollution Act of 1990,[5] which occurred in the aftermath of the Exxon Valdez oil spill in the Prince William Sound off the coast of Alaska.

Although the Exxon Valdez concerned marine pollution, there have also been many high-profile freshwater pollution incidents in recent memory, such as the Ok Tedi environmental disaster in the Western Province of Papua New Guinea. In this instance, the mining company BHP Billiton discharged millions of tons of tailings and other untreated mining waste from around 1984 to 2013 into the Ok Tedi and Fly Rivers. Overall, the pollution damage was so extreme experts predict it may take up to '300 years to clean up the toxic contamination,'[6] if it is not completely irreversible.

B. Water pollution incidents within the UNECE region

Although 'for decades, the UNECE region was not really confronted with water-scarcity and water-related diseases',[7] these issues have come to the fore, especially due to some relatively recent water pollution situations which have caused considerable environmental degradation as well as concerns for human health. The highly-publicised Baia Mare pollution incident is one notable example where in 2000 'the Aural mining company of Baia Mare in northern Romania spilled over 100,000 cubic metres of cyanide-polluted water into the Tisza River system'[8]. Not only did this wipe out most of the fish stocks in the Tisza River but it also threatened the drinking water supplies of the local populations downstream.[9] This incident was one of several tranbsoundary water pollution events in the UNECE region that led to the Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters ('Civil Liability Protocol'), adopted in 2003, which will be discussed in more detail later in this chapter.

Significant longer-term and ongoing water degradation has also occurred in the UNECE region; most notable at present are the issues facing the Aral Sea Basin in terms of the size of scale and duration of pollution. In this instance, the upstream riparian countries of the Aral Sea Basin have caused prolonged damage over many years to the water supply of the downstream riparian states due to chemical and bacterial pollution caused by run-off fertilizer from agricultural irrigation. In addition, water diversion schemes for irrigation and an increasing number of dams have diminished already scarce water quantities downstream, such as in the Lower Syr Darya Basin of the Aral Sea. These continued pollution challenges facing the Aral Sea Basin, as well as the Baia Mare catastrophe, have fallen within the ambit of the UNECE Water Convention's provisions and policies/activities related to pollution prevention and reduction which are based on a suite of key legal principles, explored below.

3. Development of legal principles for measures to prevent and reduce water pollution

The UNECE Water Convention was originally developed by member states predominantly as a multilateral agreement for protecting the water quality of countries across this pan-European region. That over-arching aim is supported by pollution prevention and reduction provisions contained within the text of the Convention which are based on a suite **of legal principles, specifically 'no significant harm' and the 'polluter pays' principles**. These have been accompanied by the concurrent proceduralisation of environmental protection measures worldwide; whereby Environmental Impact Assessments (EIAs) and the duty of prior notification for planned measures that may cause transboundary impacts are now generally accepted elements of international law. The origin and

[5] Oil Pollution Act of 1990, 33 U.S.C. §§2701-2761 (2006)
[6] See: <http://www.theage.com.au/news/business/villagers-sue-bhp-billiton-for-5bn/2007/01/19/1169095978975.html> accessed on 12 April 2014.
[7] Barlund, K. 'Cooperation on transboundary waters: a challenge for Europe and other regions in the world' (2003) 21-27, see: http://www.iwacportal.org/File/downloads/barlund_2003.pdf, accessed on 12 April 2014; 21-22
[8] Barlund, above n7, 21-22
[9] Ibid.

status of **these** legal principles will now be briefly outlined to contextualise how they relate to the UNECE Water Convention's provisions on preventing and reducing water pollution.[10]

A. Legal principle of no significant harm and related duty to prevent and reduce pollution

No significant harm, as a principle, is one of the key legal pillars of measures related to preventing and reducing water pollution. Indeed, it can be said that 'a number of international obligations emanate from the no significant harm principle, including the obligation to prevent and abate transboundary water pollution, the obligation to undertake an Environmental Impact Assessment for activities with the potential for transboundary consequences, and the obligation to protect ecosystems'.[11] Hence, the principle of no significant harm and its related obligations can collectively be an especially useful suite of legal tools in preventing and reducing pollution.

As pertains to the UNECE Water Convention, the particular duty to prevent and reduce the pollution *of transboundary water resources* is a 'derivative principle and specific application of the no significant harm rule'[12]. Therefore, 'no significant harm' and its accompanying legal obligations, such as the duty to conduct an EIA to assess the risk of harm, directly apply to stopping and/or mitigating any harm to water-related resources (encompassing aquatic and terrestrial) which can be characterised as 'pollution' where the source and resulting harm occur separately across international borders.[13] Given the development and codification of the above legal rules and principles in many international water agreements, 'the obligation to prevent and abate transboundary water pollution is an emerging, if not already established, customary international legal norm,'[14] as evidenced below.

According to the polluter pays principle, 'those who cause pollution should meet the costs to which it gives rise'[15]. This principle has been codified in many laws and regulations whereby it is a measure 'used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment'[16]. Notably, it was enshrined in the Rio Declaration to emerge from the United Nations Conference on Environment and Development in 1992, which provides that, 'National authorities should endeavour to promote the internationalization of environmental costs and the use of economic instruments, taking into account *the approach that the polluter should, in principle, bear the cost of pollution*, with due regard to public interest and without distorting international trade and investment'[17]. In the context of water, the polluter-pays-principle 'is not a new concept but has not yet been fully implemented, despite the fact that it is widely recognised that the perception of water as a free commodity can no longer be maintained'[18]. However, it remains a guiding legal principle in environmental law to prevent and control pollution; one that is generally accepted in international law.

4. UNECE Water Convention provisions to prevent and reduce water pollution

Originally envisaged as the first pan-European framework treaty of its kind that would obligate member states to prevent and reduce pollution of transboundary water resources, the UNECE Water

[10] Due to the limited scope of this chapter, analysis will focus predominantly on the principle of no significant harm and the derivative legal rule to reduce and prevent pollution.
[11] UNEP, above n 2, 45.
[12] Ibid.
[13] Ibid.
[14] Ibid..
[15] Correljé, A., François, D., Verbeke, T. 'Integrating water management and principles of policy: towards an EU framework?' (2006) Journal of Cleaner Production, 1-8, 2. See: <https://biblio.ugent.be/input/download?func=downloadFile&recordOId=431714&fileOId=496605> accessed on 10 June 2014.
[16] Ibid.
[17] Principle 16, 1992 Rio Declaration on Environment and Development, adopted 14 June 1992, Rio de Janeiro, Brazil, UN Doc. A/CONF.151/26 (vol.1) / 31 ILM 874 (1992) [emphasis added].
[18] WHO/UNEP, Richard Helmer and Ivanildo Hespanhol (eds), 'Water Pollution Control: A guide to the use of water quality management principles' (1997) 18. See: <http://www.who.int/water_sanitation_health/resourcesquality/watpolcontrol.pdf> accessed on 10 June 2014.

Convention provisions encapsulate **all the aforementioned legal principles** and associated obligations.

A. Key Provisions

The basic principle of no significant harm is explicitly enshrined in Art 2 of the UNECE Water Convention which stipulates that parties 'take all appropriate measures to prevent, control and reduce any transboundary impact'[19]. Furthermore, this obligation notably applies to 'pollution of waters *causing or likely to cause* transboundary impact'[20] whereby it should also be prevented, controlled or reduced at the source if possible,[21] and not result in direct or indirect pollution transfer.[22] It goes on to provide that in taking all appropriate measures to prevent, control and reduce any transboundary impact or water pollution that parties will be guided by the following principles: precautionary approach;[23] polluter pays;[24] and intergenerational equity.[25] Hence, each of these legal principles must be taken into account when implementing measures under the Convention which are intended to fulfil the over-arching obligation to cause no significant harm.

a. Prevention, Control and Reduction of Pollution

Article 3 of the UNECE Water Convention is designed to cover all provisions specifically related to the obligation to prevent, control and reduce pollution, especially those causing transboundary impacts. To this end, Art 3(1) stipulates that 'Parties shall develop, adopt, implement and, as far as possible, render compatible relevant legal, administrative, economic, financial and technical measures' to ensure a range of outcomes occur that seek to fulfil this obligation. Key outcomes included in Art 3(1) are as follows:

> (a) The emission of pollutants is prevented, controlled and reduced at source through the application of, inter alia, low- and non-waste technology;
> (b) Transboundary waters are protected against pollution from point sources through the prior licensing of waste-water discharges by the competent national authorities, and that the authorized discharges are monitored and controlled;
> (c) Limits for waste-water discharges stated in permits are based on the best available technology for discharges of hazardous substances;
> (d) Stricter requirements, even leading to prohibition in individual cases, are imposed when the quality of the receiving water or the ecosystem so requires;
> (e) At least biological treatment or equivalent processes are applied to municipal waste water, where necessary in a step-by-step approach;
> (f) Appropriate measures are taken, such as the application of the best available technology, in order to reduce nutrient inputs from industrial and municipal sources;
> (g) Appropriate measures and best environmental practices are developed and implemented for the reduction of inputs of nutrients and hazardous substances from diffuse sources, especially where the main sources are from agriculture (guidelines for developing best environmental practices are given in annex II to this Convention);
> (h) Environmental impact assessment and other means of assessment are applied;
> (i) Sustainable water-resources management, including the application of the ecosystems approach, is promoted;
> (j) Contingency planning is developed;
> (k) Additional specific measures are taken to prevent the pollution of groundwaters;
> (l) The risk of accidental pollution is minimized.

[19] Art 2(1).
[20] Art 2(2)(a) [emphasis added].
[21] Art 2(3).
[22] Art 2(4).
[23] Art 2(5)(a).
[24] Art 2(5)(b).
[25] Art 2(5)(c).

Art 3(2) further strengthens these obligations when it subsequently states that on top of this list of key outputs, each 'Party shall *set emission limits for discharges from point sources* into surface waters *based on the best available technology*, which are *specifically applicable to individual industrial sectors or industries* from which hazardous substances derive'[26]. In addition, it allows for parties to place a 'total or partial prohibition of the production or use'[27] of hazardous substances which may be causing point or diffuse pollution into waters. To this end, Art 3(2) finishes by stating that '*existing lists of such industrial sectors or industries and of such hazardous substances* in international conventions or regulations, which are applicable in the area covered by this Convention, shall be taken into account'[28].

Art 3(3) reinforces the Convention's focus on parties setting and maintaining water quality standards that will protect the environment and human health. In this respect, the provision stipulates that 'each Party shall *define, where appropriate, water-quality objectives and adopt water-quality criteria* for the purpose of preventing, controlling and reducing transboundary impact'[29]. Art 3(3) therein details that Annex III of the Convention provides general guidance which parties can use in developing any such water quality objectives or criteria, which must:

> (a) Take into account the aim of maintaining and, where necessary, improving the existing water quality;
> (b) Aim at the reduction of average pollution loads (in particular hazardous substances) to a certain degree within a certain period of time;
> (c) Take into account specific water-quality requirements (raw water for drinking-water purposes, irrigation, etc.);
> (d) Take into account specific requirements regarding sensitive and specially protected waters and their environment, e.g. lakes and groundwater resources;
> (e) Be based on the application of ecological classification methods and chemical indices for the medium- and long-term review of water-quality maintenance and improvement;
> (f) Take into account the degree to which objectives are reached and the additional protective measures, based on emission limits, which may be required in individual cases.[30]

b. Supplementary provisions that support prevention and reduction of water pollution

The set of provisions in Art 3 are in-turn supported by a range of inter-related articles in the Convention. These either directly or indirectly contribute to achieving this particular obligation of preventing and reducing pollution and its associated duties under the principle to cause no significant harm. Article 4 obliges State parties to 'establish programmes for monitoring the conditions of transboundary waters'. Article 5 then stipulates that States must 'cooperate in the conduct of research into and development of effective techniques for the prevention, control and reduction of transboundary impact'. In a unique measure compared to most other major watercourse agreements, Art 5 goes further to list specific topics or related programmes that such research should, *inter alia*, be aimed at:

> (a) Methods for the assessment of the toxicity of hazardous substances and the noxiousness of pollutants;
> (b) Improved knowledge on the occurrence, distribution and environmental effects of pollutants and the processes involved;
> (c) The development and application of environmentally sound technologies, production and consumption patterns;

[26] Art 3(2) [emphasis added].
[27] Art 3(2).
[28] Art 3(2) [emphasis added].
[29] Art 3(3) [emphasis added].
[30] Annex III.

(d) The phasing out and/or substitution of substances likely to have transboundary impact;
(e) Environmentally sound methods of disposal of hazardous substances;
(f) Special methods for improving the conditions of transboundary waters;
(g) The development of environmentally sound water-construction works and water-regulation techniques;
(h) The physical and financial assessment of damage resulting from transboundary impact.

Many of the other supplementary provisions of the UNECE Water Convention related to pollution prevention and reduction mirror, or often go further than, those of the major watercourse agreements mentioned previously. Article 6 requires State parties to exchange information as early as possible on issues covered by the Convention, *inter alia*, those directly or indirectly concerned with preventing, controlling and reducing pollution. Article 7 concerns the elaboration of 'criteria and procedures in the field of responsibility and liability' which includes transboundary harm.

In Part II regarding Provisions Relating to Riparian Parties, Article 9 specifically relates to bilateral and multilateral cooperation whereby State parties must enter into 'bilateral or multilateral agreements or other arrangements, where these do not yet exist, or adapt existing ones, where necessary to eliminate the contradictions with the basic principles of this Convention, *in order to define their mutual relations and conduct regarding the prevention, control and reduction of transboundary impact*'[31]. Here, the over-arching aim of the Convention to protect and maintain water quality standards for environmental and human health is further reinforced in so far as the duty to cooperate by entering into, or altering existing, agreements, is explicitly related to the duty to cause no significant harm via the prevention, control and reduction of transboundary impacts.

Moreover, Art 9(2) goes on to necessitate establishment of joint bodies for administering and implementing such agreements whereby their work must include a number of listed tasks, which explicitly or inherently pertain to obligations and measures regarding preventing, controlling and reducing pollution.[32] Art 9 finally details that coastal State parties and/or their own existing joint bodies established to protect marine environments may be involved in the activities of joint bodies whilst also encouraging those in the same catchment area to cooperate to 'strengthen the prevention, control and reduction of transboundary impact'[33].

Articles 11(1)-(4) relate to the establishment and implementation of joint programmes for monitoring and assessing the conditions of transboundary waters, including 'transboundary impact'[34]. In particular, the provisions deal directly with: agreeing pollution parameters and monitoring of discharges and concentrations;[35] carrying out coordinated assessments on water quality and effectiveness of measures to prevent, control and reduce transboundary impacts;[36] and, harmonising rules for information management systems and technical measures for monitoring and assessment.[37] Art 13 complements this whereby State parties must exchange reasonably available data on such matters, including but not limited to: environmental conditions of transboundary waters;[38] emissions and monitoring data;[39] measures taken and planned to be taken to prevent, control and reduce transboundary impact;[40] and, permits or regulations for waste-water discharges.[41] Additionally, Art 13(2) provides that State parties must exchange information on their national regulations in seeking to harmonise emission limits and Art 13(4) obliges the exchange of best available technology to this end.

[31] Art 9(1) [emphasis added].
[32] Art 9(2)(a)-(j).
[33] Art 9(5).
[34] Art 11(1).
[35] Art 11(2).
[36] Art 11(3).
[37] Art 11(4).
[38] Art 13(1)(a).
[39] Art 13(1)(c).
[40] Art 13(1)(d).
[41] Art 13(1)(e).

More broadly, Art 10 necessitates that State parties consult in good faith regarding, *inter alia*, the prevention, control and reduction of transboundary impacts and pollution. Art 12 also stipulates that State parties must undertake 'specific research and development activities in support of achieving and maintaining the water-quality objectives' of any agreements established or altered under the Convention. Timely exchange of information between riparian State parties via warning and alarm systems for any 'critical situation that may have transboundary impact' which, *inter alia,* would include pollution events is obliged under Art 14. Furthermore, Art 16 decrees that States must ensure that 'information on the conditions of transboundary waters, measures taken or planned to be taken to prevent, control and reduce transboundary impact, and the effectiveness of those measures, is made available to the public'[42]. Such information must be obtainable in a timely manner, as well as free of charge where possible.[43] It must also include the following: water-quality objectives;[44] permits issued and the conditions required to be met;[45] and the results of water and effluent sampling as well as the results of checking compliance with the water-quality objectives or the permit conditions.[46] Lastly, Art 22 which concerns the settlement of disputes in so far as these can relate to transboundary impacts inherently supports the obligation to prevent, control and reduce pollution.

5. Pollution Prevention and Reduction Measures Under the UNECE Water Convention

As evidenced by the legal obligations it codifies, especially the extensive and detailed lists in Art 3(1), the UNECE Water Convention provides incredibly detailed provisions focused on measures to prevent and reduce pollution of transboundary watercourses and lakes. Adopted in 1992, the Convention has since provided the legal platform upon which binding protocols as well as numerous working groups, guidelines, policies, pilot projects and activities have been developed over time in order to implement practical measures which seek to prevent and reduce water pollution.

A. Protocols to the UNECE Water Convention

There are two protocols to the UNECE Water Convention, both of which are separately but also commensurately aimed at the over-arching goal of preventing and reducing water pollution. The Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and Lakes ('Protocol on Water and Health'), which entered into force in 2005, aims to 'protect human health and well-being by better water management, including the protection of water ecosystems, and by preventing, controlling and reducing water-related diseases'[47]. Hence, the overarching goal of this Protocol to protect aquatic ecosystems and water resources for human health is inexorably linked with the Convention's provisions regarding preventing, reducing and controlling pollution and obligation not to cause significant harm as it relates to transboundary pollution impacts.

In order to achieve its stated aim, the Protocol on Water and Health dictates that State parties are required to set targets and implement standards for monitoring and maintaining both the quality of potable water and any discharges into freshwater resources; acting in concert with certain standards for water supply and treatment.[48] The Protocol stipulates that these standards must be determined in accordance with internationally recognised benchmarks, referring specifically to 'the World Health Organization (WHO) guidelines for drinking-water quality and the WHO/UNEP (UN Environment Programme) guidelines for the safe use of wastewater and excreta in agriculture and aquaculture, thus

[42] Art 16(1).
[43] Art 16(2).
[44] Art 16(1)(a).
[45] Art 16(1)(b).
[46] Art 16(1)(c).
[47] Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and Lakes, adopted in London, 17 June 1999 <http://www.unece.org/env/water/pwh_text/text_protocol.html> accessed 1 June 2014.
[48] See, Wouters, P. & Vinogradov, S., 'Analysing the ECE Water Convention: What Lessons for the Regional Management of Transboundary Water Resources?' 2004, Yearbook of International Co-Operation on Environment and Development 55, 58

creating another link stretching beyond the UNECE institutional boundaries'[49]. Implementation of these standards ties into the UNECE institutional arrangements whereby the functions of the Protocol's secretariat are jointly administered by the UNECE and WHO/EURO Secretariats.[50]

Significantly for the UNECE region and its shared watercourses and lakes, the Protocol on Water and Health is the first legal protocol of its kind aimed at measures to protect water quality and inter alia human health under the mandate of a regional transboundary water framework agreement. To this extent, the underlying rationale and impetus for its adoption was to ensure an adequate supply of potable water for riparian State parties. As set out in the Protocol itself, this aim is to be achieved by securing effective sanitation and water quality monitoring standards for all State parties within the broader strategic framework of an Integrated Water Resources Management (IWRM) approach.

The aforementioned Civil Liability Protocol gives, 'individuals affected by the transboundary impact of industrial accidents on international watercourses… a legal claim for adequate and prompt compensation'[51]. Although it is not yet in force, this Protocol, which was the result of a joint initiative carried out under the auspices of the UNECE Water Convention and the UNECE Industrial Accidents Convention, does however demonstrate the elaboration of measures to prevent and reduce pollution from the perspective of deterrence via the 'polluter pays' principle. Indeed, its aim was to fill 'a significant gap in the regional legal framework, a gap that became particularly obvious after a series of pollution accidents involving transboundary waters'[52]; the most notable of which was the Baia Mare cyanide spill in Romania mentioned previously.

By addressing the deficiencies of existing civil liability regimes at the time as well as offer additional legal remedies for victims of transboundary pollution, the Civil Liability Protocol seeks to provide a 'comprehensive regime for civil liability, including adequate and prompt compensation for transboundary damage caused by industrial accidents affecting transboundary watercourses'[53]. To this end, strict liability is imposed on all operators who cause transboundary harm to freshwater resourcesin the event of an industrial accident.[54] Moreover, the Protocol provides private citizens recourse to seek compensation from operators found responsible for transboundary damage relating to 'personal injury and harm to property and other legally protected interest, as well as the cost of response measures and measures of reinstatement of the impaired transboundary waters'[55]. Overall, both the Protocol on Water and Health, via water quality standards, and to a lesser extent the Civil Liability Protocol (as it is not yet in force), via a strict liability regime, collectively and separately provide for additional legal measures aimed at preventing, controlling and reducing water pollution which have been elaborated under the mandate of the UNECE Water Convention.

B. Non-binding Instruments

A host of non-binding instruments, particularly guidelines and declarations, have been developed over time by State parties in order to help support the development of practical measures and implementation of the more specific obligations of the UNECE Water Convention and its Protocols. In effect, these 'living' – in so far as they are often adaptable and evolving to be temporally and geographically contextual – documents help provide greater clarity and improved accuracy in the daily application of the Convention and its Protocols by State parties so that they can better fulfil their legal obligations and achieve their aims. Despite their non-binding nature, the extensive suite of subsidiary instruments which have been adopted under the Convention is not only extremely impressive, but also collectively they have made a significant contribution to strengthening the

[49] Wouters & Vinogradov, above n48, 58.
[50] Ibid.
[51] See: <http://www.unece.org/env/civil-liability/welcome.html> accessed 1 June 2014.
[52] Wouters & Vinogradov, above n 48, 58.; The most notable of these incidents was the Baia Mare mine tailings spill in Romania which resulted in cyanide wastewater polluting the Lapis-Tisza-Danube river system which in-turn had severe impacts downstream in Serbia and Hungary.
[53] Wouters & Vinogradov, above n48, 58.
[54] The strict liability component of the regime is subject to certain disclaimers and limitations which are generally common to other civil liability regimes of the same or similar nature.
[55] Wouters & Vinogradov, above n 48, 58.

implementation of its provisions as well as its Protocols, which includes those relating to the prevention, control and reduction of pollution.[56]

Foremost of all the non-binding instruments is the Guide to Implementing the Convention,[57] which was developed by its Legal Board and adopted by the Meeting of the Parties (MoP) in 2009, but had since been updated in 2013.[58] As the primary subsidiary non-binding instrument it aims to provide strategic and detailed (yet non-binding) directions for State parties on how to meet their legal obligations under the Convention.[59] Whilst it is a general guide to implementation covering major provisions and substantive aspects of the Convention, it thereby specifically deals with all of the specific provisions outlined in the previous section which are directly or indirectly related to the prevention, reduction and control of pollution, especially that which causes transboundary impacts. Thus, the comprehensive explanation of how to implement each provision including the Annexes provided by the Guide to Implementing the Convention is a crucial document to be used in conjunction with the Convention text by State parties in fulfilling their legal obligations not to cause significant harm plus to prevent and reduce pollution.

Other non-binding instruments of the UNECE Water Convention regime dealing either directly or inherently with measures for pollution prevention and protection includes, but is not limited to, some of the following documents: guidelines adopted in 1993 on the ecosystem approach in integrated water resource management;[60] recommendations adopted in 1996 regarding measures to 'prevent, control, and reduce groundwater pollution from chemical storage facilities and waste disposal sites';[61] guidelines adopted in 2000 for monitoring and assessment of transboundary rivers, and transboundary groundwaters;[62] and, a set of guidelines published in 2012 regarding good practices to ensure equitable access to water and sanitation under the UNECE Water Convention.[63]

C. Projects and activities

Many of the above subsidiary instruments have been developed to promote and support the implementation of particular projects or activities under the UNECE Water Convention and its two Protocols. The aim of such initiatives is thus to 'operationalise' the legal obligations via policies and strategies that fall within the over-arching regime of the Convention and its Protocols or under specific transboundary water agreements and joint bodies established between riparian State parties.
In particular, many projects and initiatives have been instigated regarding measures for the prevention, reduction and control of water pollution based on the mandate of the Convention as well as its binding and non-binding instruments, many of which are geographically and scale specific.

One such project is the Aggtelek/Slovak Karst groundwaters pilot project initiated between Hungary and Slovakia for the Sara River Basin Management Plan. This pilot project targeted the issue of capacity-building for monitoring and assessment of groundwater quality within transboundary aquifers shared by these States. Notably, its successful completion consequently led to a number of

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[56] Ibid.
[57] UNECE, 'Integrated Management of Water and Related Ecosystems: Draft Guide to Implementing the Convention' (31 Aug 2009) ECE/MP.WAT/2009/L.2, at Para 73 <www.unece.org/fileadmin/DAM/env/documents/2009/Wat/mp_wat/ECE_mp.wat_2009_L2_%20E.pdf> accessed 1 June 2014.
[58] Guide to Implementing the Water Convention, September 2013 <http://www.unece.org/fileadmin/DAM/env/water/publications/Guide_to_implementing_the_WC/ECE_MP.WAT_39_Guide_to_implementing_water_convention_small_size_ENG.pdf> accessed 1 June 2014.
[59] See: <http://www.unece.org/env/water/meetings/legal_board/legal_board.html> accessed 1 June 2014.
[60] See: <http://www.unece.org/fileadmin/DAM/env/water/publications/documents/Library/Old_documents_found_library/ECE_ENVWA_31_eng.pdf> accessed 1 June 2014.
[61] See: <http://www.unece.org/fileadmin/DAM/env/water/documents/recc_chemstorage_wasted.pdf> accessed 1 June 2014.
[62] See: <http://www.unece.org/fileadmin/DAM/env/water/publications/documents/guidelinesgroundwater.pdf> accessed 5 June 2014.
[63] See: <http://www.unece.org/index.php?id=29170> accessed 5 June 2014.

similar proposals being implemented in other geographical areas within the region.[64] A different but no less important project example is the Assessment of Transboundary Rivers, Lakes, and Groundwaters. This provided both the first (2007)[65] and second (2011)[66] comprehensive and detailed examination of the 'status of transboundary waters in the European and Asian parts of the UNECE region, covering more than 140 transboundary rivers, 25 transboundary lakes, about 200 transboundary groundwaters and 25 Ramsar Sites or other wetlands of transboundary importance'[67]. Both assessments were an exemplar of cooperation between the UNECE Secretariat and subsidiary working groups involving water-related institutions within and between State parties and in close collaboration with external environmental agencies and treaty bodies such as the Ramsar Convention.[68] Undoubtedly, such projects have contributed to the sharing of information and setting of common standards related to water quality within and between State parties to the UNECE Water Convention which, *inter alia*, explicitly or inherently assist in preventing or reducing transboundary pollution.

Some UNECE Water Convention projects have been firmly driven by institutional bodies formed under the Convention to address specific issues, including but not limited to those concerning the prevention, control and reduction of water pollution. Such a project is the current development of 'a checklist/methodology for harmonized contingency planning for accidents with potential impacts on transboundary watercourses'[69] via the Joint Expert Group of the Water and Industrial Accidents Convention. In this case, Parties to the UNECE Water Convention and the UNECE Convention on the Transboundary Effects of Industrial Accidents decided to cooperate on developing a mutual checklist as described above due to the inter-linkages and synergies apparent between both Conventions on this specific issue.[70] Hence, this serves not only as a very clear example of a practical initiative developed under the UNECE Water Convention to prevent, reduce and control transboundary pollution incidents, but also demonstrates the need and scope for cooperation and collaboration on similar activities between the UNECE Secretariat and its subsidiary bodies with other water-related legal instruments and institutions.

6. Conclusion

Undoubtedly an urgent impetus exists to protect global water resources from different point and non-point sources of pollution as these resources are shown to have become increasingly scarce. When accompanied with the dual-fold impacts of burgeoning climate variability due to global warming and the growing transboundary nature and inter-connectedness of water-related pollution, therefore, in sum: 'it is increasingly urgent to assess the environmental impact of water-related activities so as to safeguard human health, aquatic ecosystems and the quality of transboundary waters'[71] so that appropriate measures can be implemented to address pollution. To this end, the inclusion of water quality standards in international legal instruments, such as the UNECE Water Convention, has been

[64] See: <http://www.unece.org/env/water/monitoring_pilot_activ.html> accessed 5 June 2014.
[65] See: <http://www.unece.org/fileadmin/DAM/env/water/blanks/assessment/assessmentweb_full.pdf> accessed 5 June 2014.
[66] See: <http://www.unece.org/env/water/publications/pub/second_assessment.html> accessed 5 June 2014; for the full publication, see: <http://www.unece.org/fileadmin/DAM/env/water/publications/assessment/English/ECE_Second_Assessment_En.pdf> accessed 6 June 2014.
[67] See: <http://www.unece.org/env/water/publications/pub/second_assessment.html> accessed 6 June 2014.
[68] Convention on Wetlands of International Importance especially as Waterfowl Habitat, Ramar (Iran), 2 February 1971, UN Treaty Series No. 14583, as amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987. See also: <http://www.ramsar.org/cda/en/ramsar-news-archives-2007-unece-water-convention/main/ramsar/1-26-45-48%5E22925_4000_0> accessed 6 June 2014,__ for specific examples of collaborative projects.
[69] See: <http://www.unece.org/environmental-policy/treaties/water/areas-of-work-of-the-convention/water-and-industrial-accidents.html> accessed 6 June 2014.
[70] See: <http://www.unece.org/environmental-policy/treaties/water/areas-of-work-of-the-convention/water-and-industrial-accidents.html> accessed 6 June 2014.
[71] Barlund, above n7, 21.

used as a mechanism for preventing, reducing and controlling water pollution. However, the Convention goes beyond most framework water agreements to be one of the most stringent and comprehensive frameworks worldwide in terms of its legal obligations and accompanying practical measures aimed at maintaining water quality standards for both environmental protection and human health.

The central aim of the UNECE Water Convention, during its formulation and codification, was to provide a legal platform and common benchmarks upon which water quality amongst State parties could be assessed and maintained in order to protect the environment and human health. The comprehensive suite of legal provisions in its text explicitly or inherently dealing with transboundary impacts along with the prevention, control and reduction of water pollution is one of the unique features of the Convention when compared to other international transboundary water agreements. When accompanied and supported by the considerable experience of the Secretariat, its subsidiary agencies and the joint bodies of State parties in both strategising and 'operationalising' these legal principles via a broad spectrum of policies and projects, the UNECE Water Convention undoubtedly provides a wide-ranging and in-depth package of measures to prevent and reduce water pollution.