TRANSBOUNDARY WATER POLLUTION IN THE CONTEXT OF CHINA: A Role for the UNECE Industrial Accidents Convention in Asia?

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Abstract

Using China as a key example, this contribution examines whether there is adequate legal provision in Asia for preventing and managing industrial accidents with transboundary effects, particularly those involving transboundary water pollution. If the existing regime of (mostly bilateral) measures among Asian countries is inadequate, the question is then asked as to whether the international framework developed by the United Nations Economic Commission for Europe (UNECE) for the transboundary effects of industrial accidents could offer an appropriate and feasible solution. To explore these questions in more detail, existing provisions for industrial accidents and transboundary water pollution are reviewed, with particular reference to China's arrangements with some of its neighbours. Salient features of the UNECE Convention on the Transboundary Effects of Industrial Accidents, and the potential benefits offered by membership in the Asian context, are identified. Finally, there is a discussion as to whether the Convention could be adopted by Asian countries, and the prospects for taking action on the issue of transboundary water pollution in the region.

Introduction

Water pollution caused by industrial facilities, whether major or minor in scale, is commonplace throughout the Asian region. Although some efforts have been made by governments in recent years to prevent them and deal with their after-effects, the appropriate management of industrial accidents remains a significant challenge. Given the many international rivers that dissect Asia and the expanding industrial development along some political borders within the region, industrial accidents with transboundary consequences are inevitable. This becomes readily apparent when the example of the Songhua River spill is examined, with its broad implications for the affected populations, for the surrounding environment, and for Chinese-Russian political relations.

The first key question that this article attempts to address is whether there is currently an adequate legal framework in place for the prevention and management of the

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transboundary impacts of industrial accidents in Asia. Given the limited scope here for investigating this issue for the whole of Asia, only a brief overview of existing legal frameworks is provided. However, to obtain a more useful insight, specific attention is paid to one Asian country that is particularly prone to major industrial accidents – China – and how it responds to the issue through cooperation with its neighbours.

The second key question to be posed by this article is whether - assuming that there are significant gaps in the existing regulation of transboundary industrial accidents in Asia - the agreement developed for similar purposes by the United Nations Economic Commission for Europe (UNECE) might offer Asian countries a means by which they could implement their own comprehensive laws, thus achieving greater consistency across the region. This question will be explored by examining the key features of the UNECE Convention on Transboundary Effects of Industrial Accidents, assessing its potential benefits and suitability for Asian countries, identifying potential hurdles, and explaining the current issue regarding non-UNECE membership of the Convention.

The structure of the article begins with an overview of an important transboundary industrial accident in China, and an explanation as to how this was, to some degree, a catalyst for efforts by China to formalise bilateral arrangements with some of its neighbours on the issue. There is a discussion as to whether these arrangements are adequate, and whether other parts of Asia have dealt with the issue in a similar way. This leads to a discussion as to why a regime for the prevention and management of transboundary industrial accidents (particularly those involving transboundary waters) is needed in China, and in Asia as a whole.

In the second half of the article, the background, key provisions and core obligations of the UNECE Convention on Transboundary Effects of Industrial Accidents are outlined. The potential benefits of the Convention for Asian countries, whether as a binding agreement or merely used as a benchmark, are explored. The technical issue of whether the Convention could be extended to Asian countries (most of which are not currently UNECE members) is identified, with reference to ongoing discussions over the possible opening-up of membership to the Convention. The existing role of the Convention in Central Asian countries is also briefly mentioned. Conclusions are then drawn as to whether it would be both advantageous and feasible for other Asian countries to make use of the Convention to improve regional regulation of transboundary industrial accidents.

I. Transboundary Industrial Accidents in Asia: Example of the Songhua River Spill

A decade ago, in late 2005, an explosion occurred at a petrochemical factory in Jilin, which is in northeastern China. The factory was owned by PetroChina, a subsidiary of the state-owned China National Petroleum Corporation. As a result of the explosion, several workers

were killed and a toxic mixture of benzene and other chemicals spilled into the nearby Songhua River. The 80-kilometre-long chemical plume was then carried downstream into the Amur River, which flows along the China-Russia border. For one week after the accident, local officials delayed notifying either the Central People's Government, governments of downstream provinces, the general public, or Russian authorities.[1] The water supply to Chinese cities along the Songhua and Amur rivers, including Harbin, was suspended for several days without any clear explanation to the local residents.[2] The chemicals eventually passed through the far eastern part of Russia known as Khabarovsk Krai, although by this time the Russian authorities had been alerted, mitigation measures had been implemented, and the toxicity of the plume had been somewhat reduced.[3]

The accident rapidly became the source of political tension between regional officials in China and Russia, primarily due to the considerable delay by China in notifying Russia of the spill, and due to the lack of specific information initially provided.[4] One Russian official initially threatened to pursue China in the international courts for compensation for cleanup costs, which were estimated at around USD$7 million.[5] Although the Chinese Government was subsequently able to diffuse this tension through diplomatic gestures and the provision of technical and economic assistance,[6] most of the associated costs could likely have been avoided if a clear framework had been in place to respond to the accident. As Qi Gao notes:

> *Although the mitigation measures seemed to be effective to a large extent, PetroChina […] and local government's initial attempt to cover up the [Songhua River] water pollution accident was strongly criticized both within and outside China. Lessons from this incident*

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[1] Qi Gao, A Procedural Framework for Transboundary Water Management in the Mekong River Basin: Shared Mekong for a Common Future (Martinus Nijhoff, 2014) 135.

[2] E Wishnick, 'Why a Strategic Partnership?' in J Bellacqua (ed), *The Future of China-Russia Relations* (University Press of Kentucky, 2010) 71.

[3] These impacts included contamination of the water supply and widespread fish deaths.

[4] Song Ying, 'International Legal Aspect of the Songhua River Incident', in MG Faure and Song Ying (eds), *China and International Environmental Liability: Legal Remedies for Transboundary Pollution* (Elgar, 2008) 315, 325.

[5] S Blagov, 'Damage Control for Russia and China after Chemical Spill', *China Environmental News Digest* (23 January 2006).

[6] Both China and Russia conducted large-scale construction works to divert the polluted water from Russian city water supplies; China also issued a formal apology and provided Russia with water testing kits and purification materials.

> *called for transparency regarding environmental emergencies and more stringent and accountable requirements for polluter and local government to report to relevant authorities.*[7]

Specific problems that were found to have exacerbated the Songhua River accident and a series of pollution incidents that followed in other Chinese rivers, included the failure to undertake a risk assessment to identify the source of pollutants, poor supervision of pollution sources and poor monitoring of water quality, and the lack of emergency and response planning for accidental pollutant releases.[8]

The problems inherent in the inadequate response by local officials to the Songhua River accident stemmed from broader, systemic problems with China's environmental regulatory framework at the time. These included weak local enforcement of environmental laws, lack of communication between government agencies and officials, and poor emergency response capabilities.[9] The widespread delegation of primary responsibility for water pollution control to local governments, and a lack of clarity as to the role of Central Government in such matters, only served to compound these problems.[10] A decade later, similar issues continue to hamper the Chinese Government's attempts to regulate environmental issues, although a nationwide campaign was announced in early 2014 to strengthen anti-pollution laws, to impose harsher penalties for relevant offences, and to empower officials to take action against polluters.[11]

A. The Legacy of the Songhua Spill

The high-profile Songhua River spill revealed the potential challenges posed by the transboundary impacts of industrial accidents, in the absence of a comprehensive regulatory regime to prevent and mitigate such impacts. Yet the petrochemical plant at the heart of the Jilin accident was just one of an estimated 2,000 industrial facilities located along the Songhua River, which has long been recognised as one of the most polluted waterways in

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[7] Qi Gao above (n. 1) at 135.

[8] Zhong Ma, 'Emergency Planning and Response for Accidental Release of Water Pollutants in China: Lessons from the Songhuajiang River Incident', *China: Addressing Water Scarcity,* Background Paper Series (World Bank Analytical and Advisory Assistance Program, 2007) 2.

[9] N Green, 'Positive Spillover? – Impact of the Songhua River Benzene Incident on China's Environmental Policy', *China Environment Forum* (The Wilson Center, 2009).

[10] Zhong Ma above (n. 8) at 3.

[11] T Branigan, 'Chinese Premier Declares War on Pollution in Economic Overhaul', *The Guardian* (5 March 2014).

China.[12] Despite some measures to address pollution of the river since 2005, the potential still exists for further accidents with similar transboundary consequences and this potential is not limited to the Songhua River.[13]

Several other transboundary rivers originate in China,[14] constituting a major source of water for many other countries in the region.[15] Not all of these rivers currently have major industrial facilities located along their banks and for this reason rivers in the relatively undeveloped western regions of China are generally found to be cleaner than those in the northeast region, which is known as the 'industrial cradle of China'.[16] However, industrial development along the 'cleaner' transboundary rivers is either already underway or very likely to occur in the future.[17] Three such examples are the intensive development planned for the Chinese section of the Irtysh River (upstream from Kazakhstan and Russia),[18] new infrastructure projects along the Upper Mekong River (upstream from Myanmar, Laos, Thailand, Cambodia and Vietnam)[19] and the 'Silk Road Economic Belt' development initiative proposed by the Chinese Government in 2013.[20]

A report by a team of experts from the United Nations Environment Programme, invited by the Chinese Government to investigate the Songhua River accident, provided

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[12] See LA Kirschner and EB Grandy, 'The Songhua River Spill: China's Pollution Crisis', *Natural Resources and Environment* (American Bar Association, 2006) 66-68.

[13] Another spill occurred in a tributary of the Songhua River in mid-2006, although it did not have any reported transboundary consequences.

[14] Including the Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Ob, Ili and Tumen Rivers: see S le Clue, 'Geopolitical Risks: Transboundary Rivers', *China Water Risk* (2012). <http://chinawaterrisk.org/resources/analysis-reviews/geopolitical-risks-transboundary-rivers/> accessed 31 July 2015.

[15] Pakistan, India, Nepal, Bangladesh, Burma, Laos, Thailand, Cambodia, Vietnam, Korea and Kazakhstan.

[16] Green above (n. 9).

[17] See for example, the discussion of the likely future development of the Mekong River region, in Qi Gao above (n. 1) at 130.

[18] K Muratshina, 'The Irtysh River in the Hydro Policy of Russia, Kazakhstan and China', Russian International Affairs Council (29 May 2012).

[19] Daming He *et al.*, 'China's Transboundary Waters: New Paradigms for Water and Ecological Security through Applied Ecology' (2014) 51 Journal of Applied Ecology 1159, 1163.

[20] Although much of the associated development may occur in northwestern China beyond the reach of any transboundary rivers, any industrial accidents that occur on the Tibetan Plateau could ultimately affect a number of downstream countries.

advice on measures that could be taken to prevent similar accidents in the future.[21] Noting that the Jilin explosion was 'of major transboundary and international significance', the report found that communication and sharing of information by the government with the affected public was inadequate at the early response stage.[22] It proposed a number of measures on awareness, preparedness and response to environmental emergencies, as part of a systemic approach to the problem.[23] Specific measures included the drawing up of contingency plans, application of methodological tools (such as the 'APELL' tool developed by UNEP[24]) and use of independent water sampling and analysis methods.[25] The UNEP recommendations were echoed by others, who called for the establishment of an effective emergency response mechanism for China's river basins as a matter of urgency and necessity.[26] According to one critic, too much of the authorities' attention was being directed to reactive measures such as accident control and remediation, instead of focusing on risk assessment and accident prevention.[27]

In addition to specific cooperative measures for management of the Songhua River, UNEP also recommended that an international body be established by the riparian countries of the broader Amur River Basin to oversee its 'sustainable development' as a whole.[28] The role of this international commission would be to facilitate joint monitoring and information sharing, to ensure the implementation of early warning and emergency response procedures and of relevant work programs, and to promote the use of risk inventories.[29] However, the recommendation by UNEP has yet to eventuate in any multilateral initiatives for the Amur

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[21] United Nations Environment Programme, 'The Songhua River Spill, China, December 2005 – Field Mission Report' (2005).

[22] Ibid.

[23] Ibid.

[24] Awareness and Preparedness for Emergencies at Local Level (APELL): United Nations Environment Programme, *Commemorating 25 Years of Awareness and Preparedness for Emergencies at Local Level: Achievements and Way Forward* (UNEP 2012) 4.

[25] United Nations Environment Programme above (n. 21).

[26] Zhong Ma above (n. 8) at 4.

[27] Ibid.

[28] UNEP above (n. 21) at 17. The riparian countries of the Amur River Basin include China, Russia, Mongolia and North Korea.

[29] Ibid.

River Basin, while China continues to prefer the use of bilateral arrangements with its neighbours for the management of its transboundary rivers.[30]

One outcome of the Songhua River accident was the formulation in early 2006 of a National Plan for Rapid Response to Environmental Accidents by the Chinese Government.[31] The National Plan sets out requirements for pollution source monitoring and control (including an online monitoring system for major pollution sources), risk analysis and evaluation, timely and accurate release of information in emergency situations and other procedures for domestic responses to emergencies.[32] According to Qi Gao, the National Plan is supported by the Emergency Response Law and Regulations on Government Information Disclosure, both of which were enacted by the Chinese Government in 2007.[33]

The Emergency Response Law requires the Chinese Government to cooperate and communicate with foreign governments and with relevant international organisations on emergency-related matters such as preventive measures, monitoring and surveillance operations, warning procedures, response actions, rehabilitation and reconstruction measures, and liability provisions.[34] The Emergency Response Law is quite detailed in allocating administrative responsibilities and setting out procedures to be followed, but none of these relate to interaction with foreign governments. The law contains no details as to exactly *how* China should 'cooperate with foreign governments' with regard to emergencies with potential transboundary effects. This appears to be based on the assumption that the matter will be addressed through bilateral agreements with China's neighbours or through informal channels.

B. Sino-Russian Cooperation on Emergency Preparedness and Transboundary Water Pollution

In addition to enhancing its domestic efforts to regulate major pollution incidents, China embarked on several new bilateral initiatives on transboundary water cooperation with Russia following the Songhua River accident. The first of these was the signing of a

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[30] For example, in 2001, China signed a bilateral agreement with Kazakhstan on the use and protection of transboundary rivers, and a similar intergovernmental agreement was signed with Russia in 2008 (the *Agreement on the Rational Utilization and Protection of Transboundary Waters*).

[31] Qi Gao above (n. 1) at 135; Zhong Ma above (n. 8).

[32] Qi Gao above (n. 1) at 135-136; Zhong Ma above (n. 8) at 4.

[33] Qi Gao above (n. 1) at 136.

[34] Art. 15, Emergency Response Law of the People's Republic of China (2007).

memorandum in early 2006 to undertake joint monitoring of transboundary waters.[35] This was soon followed by the issuing of a declaration acknowledging the need to intensify joint environmental protection efforts in their boundary areas, so as to prevent 'technogenic catastrophes' and to minimise harm to people and to the environment caused by both man-made and natural disasters.[36] China and Russia also signed a more formal instrument, the *Agreement on Cooperation in the Area of Prevention and Elimination of Emergency Situations*.[37] However, as Vinogradov and Wouters note, this agreement is limited in scope:

> *[T]he Agreement focuses primarily on preparedness and response, including conditions of mutual assistance, to all emergencies regardless of their place or impact. There is only one general reference to the transboundary aspect of emergency situations in the entire text.*[38]

Moreover, the 2006 Agreement has never entered into force. According to Vinogradov and Wouters, both this and the 2006 Joint Declaration appear to have been supplanted by two further bilateral initiatives in 2008, namely the China-Russia *Agreement on the Rational Utilization and Protection of Transboundary Waters* and an intergovernmental memorandum on early warning and information exchange for transboundary environmental emergencies.[39] The 2008 Agreement, which is essentially a framework document, contains provisions on transboundary emergencies, including the establishment of early warning systems and information exchange to prevent emergencies on transboundary waters.[40] It requires the Parties to immediately notify each other of any emergencies, to exchange any relevant information, and to undertake any necessary, reasonable measures to eliminate or mitigate

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[35] On 21 February 2006, China and Russia signed the *Memorandum on Joint Monitoring of the Sino-Russian Border Waters*: 'China and Russia Sign River Monitoring Pact', Environment News Service (21 February 2006).

[36] *Joint Declaration of the Russian Federation and the People's Republic of China* (Beijing, 21 March 2006), cited in S Vinogradov and P Wouters, 'Sino-Russian Transboundary Waters: A Legal Perspective on Cooperation' (Institute for Security and Development Policy, 2013) 31.

[37] Agreement between the Government of the Russian Federation and the Government of the People's Republic of China on Cooperation in the Area of Prevention and Elimination of Emergency Situations (21 March 2006).

[38] Vinogradov and Wouters above (n. 36) at 40.

[39] Memorandum between the Ministry of Natural Resources and Ecology of the Russian Federation and Ministry of the Environment of the People's Republic of China on the Establishment of the Mechanism of Early Warning and Exchange of Information in Cases of Transboundary Environmental Emergencies (12 November 2008); S Vinogradov and P Wouters above (n. 36) at 40.

[40] Art. 6 of the 2008 Agreement; Vinogradov and Wouters above (n. 36) at 40.

the effects of the emergency situation.[41] The informal memorandum, signed by the respective Ministries of the Environment, obliges China and Russia to warn each other promptly of any incidents involving releases of radioactive substances or of hazardous chemicals and of significant pollution of transboundary rivers or of the atmosphere.[42] However, the memorandum is neither legally binding nor detailed in its provisions.

On the face of it, these bilateral initiatives between China and Russia—as one example of China's efforts to regulate emergencies and their transboundary effects, particularly on rivers—seem to offer some regulatory elements of relevance to transboundary industrial accidents. However, upon closer inspection, most of the obligations of the Parties are only broadly worded, and the procedures to be followed are only laid out in basic terms. For example, the duty of notification in the 2008 Agreement merely requires the two Parties to inform one another, in accordance with 'previously agreed procedures', about any ongoing and planned measures on transboundary waters that 'may cause significant transboundary impact'.[43] It is doubtful whether such an obligation would extend to industrial accidents, given that they usually occur with little or no forewarning. The notification requirement in the informal 2008 memorandum, although specifically referring to significant transboundary pollution incidents, is not binding on either of the Parties.

The China-Russia bilateral agreements might be considered as perhaps the most comprehensive of all the transboundary water management regimes existing between China and its neighbours. Although China has shown a clear preference for bilateral (as distinct from trilateral or multilateral) cooperation on such issues, the actual procedural and substantive obligations included in the bilateral instruments have varied considerably. To illustrate these inconsistencies, some comparisons may be drawn between the China-Russia initiatives discussed above, and the agreements that have been made between China and two of its other northern neighbours, Kazakhstan and Mongolia.

C. Other Bilateral Initiatives by China with Neighbouring Countries

In 2001, China and Kazakhstan signed the Agreement on Cooperation in the Use and Protection of Transboundary Rivers.[44] A joint commission was also established by the two

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[41] Vinogradov and Wouters above (n. 36) at 40.

[42] Ibid.

[43] Art. 2, para 8 of the Agreement; cited in Vinogradov and Wouters above (n 36) 40.

[44] Agreement between the Government of the Republic of Kazakhstan and the Government of the People's Republic of China on Cooperation in the Field of Use and Protection of Transboundary Rivers (12 September 2001).

countries in 2003 to coordinate implementation of the agreement.[45] Although there are other bilateral agreements between China and Kazakhstan that relate to transboundary rivers, including one on emergency notification for natural disasters (2005)[46] and another on protection of water quality (2011),[47] there are none relating to industrial accidents. Issues relating to the water quality of transboundary rivers are addressed by the Kazakh-Chinese Commission on Cooperation in the Field of Environmental Protection, which has a working group on rapid response to disasters and pollution prevention.

The 2001 China-Kazakhstan Agreement imposes an obligation not to cause harm. It requires the Parties to undertake appropriate measures and 'make efforts to prevent or mitigate serious harm caused to a State Party as a result of […] man-made accidents'[48] A duty to cooperate on matters relating to the use and protection of their shared rivers is also contained in the Agreement, although industrial accident prevention is not specifically mentioned as one of the areas of cooperation.[49] These are only very broad obligations and do not offer any detailed guidance on procedures to be followed by either Party in the event of a major industrial accident affecting their transboundary rivers.

In a similarly general vein, yet using different wording, the 1994 China-Mongolia *Agreement on Protection and Utilization of Transboundary Waters* provides that the Parties 'shall take measures to prevent, mitigate and eliminate any possible harm to the quality, resources, physical trend and aquatic animals and plants of the transboundary waters caused by natural or human factors such as […] accidents in production.'[50] No details are provided regarding the appropriate harm prevention, mitigation or elimination measures to be taken by either Party, nor are there any definitions of the terms 'human factors' or 'accidents in production'. A *Memorandum of Understanding on Strengthening Cooperation on Trans-border Rivers*, signed by China and India in 2013, refers only fleetingly to the need to cooperate on 'emergency management' of trans-border rivers, without further explanation.[51]

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[45] The Joint Commission in the Field of Use and Protection of Transboundary Rivers, which has been part of the Kazakh-Chinese Cooperation Committee since October 2008.

[46] Agreement on Emergency Notification of the Parties of Natural Disasters on Transboundary Rivers

[47] Agreement on Protection of Water Quality of Transboundary Rivers (22 February 2011).

[48] Art. 3.

[49] Art. 2 and Art. 5.

[50] Art. 6.

[51] Ministry of External Affairs, Government of India, Memorandum of Understanding between the Ministry of Water Resources, the Republic of India and the Ministry of Water Resources, the People's Republic of China on Strengthening Cooperation on Trans-border Rivers (23 October 2013).

D. China's Bilateral Efforts: Conclusions

While it may be concluded that the China-Russia bilateral initiatives are indeed the most highly developed regime for transboundary water cooperation—when compared to other Chinese bilateral efforts on the issue—they can hardly be described as an unbridled success, particularly in terms of preventing transboundary pollution. As Vinogradov has noted, 'the ecological situation in the Sino-Russian transboundary basins is far from satisfactory. Pollution as a result of industrial accidents and wastewater discharges is a recurrent issue.'[52] The inconsistencies between the various bilateral agreements with China's northern neighbours also make it difficult to discern a consistent pattern of state practice, although the duties to cooperate and to avoid harm are clearly common to all of these agreements. If even China cannot achieve consistency in its transboundary water relations over a period of two decades, the prospects of other Asian countries being able to do so without any form of external guidance would appear slim.

China provides a useful illustration of the limits of cooperative efforts that have been made by some Asian countries to address certain aspects of the complex issue of transboundary waters. Other parts of Asia have attempted to cooperate on transboundary waters with even less success. For example, according to Ziganshina, '[a]lthough there are plenty of legal instruments at the bilateral, sub-basin, and basin levels governing the use and protection of shared watercourses in Central Asia, these agreements are in dire need of improvement as they fail to incorporate key principles of international water law and best management practices.'[53] With reference to the Aral Sea Basin, she observes that '[e]xisting legal arrangements in the basin were not designed to accommodate changing circumstances, nor can they be easily amended. As a result, many of these treaties have become stagnant and have lost their value.'[54]

Even if the bilateral efforts of China and its neighbours go some way to regulating transboundary water resources, they are largely inadequate for the purpose of industrial accident prevention and management. The latter purpose, to be fair, has not been the focal point of these bilateral relations, so it is perhaps unrealistic to expect anything more. Moreover, China has declined to make any agreements on transboundary water matters at

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[52] S Vinogradov, 'Can the Dragon and Bear Drink from the Same Well? Examining Sino-Russian Cooperation on Transboundary Rivers through a Legal Lens' (2013) 23:3 Journal of Water Law 95, 96.

[53] D Ziganshina, 'UN Watercourses Convention in Central Asia – The Current State and Future Outlook' (2014) International Water Law Project
<http://www.internationalwaterlaw.org/> accessed 11 August 2015.

[54] Ibid.

all with its southern neighbours. Wouters has observed that 'issues remain, especially with respect to the transboundary waters shared across China's southern borders where there is an absence of treaty practice.'[55] This means that there is currently no regulatory framework in place regarding transboundary waters (much less industrial accidents on such waters) that flow from or through China to several south- and south-east Asian countries.

II. Why is a Regime for Transboundary Water Pollution Needed?

There are several reasons why the lack of provision for cooperation on transboundary accidents—whether via shared waterways, groundwater, soil or air—is problematic. First, when an accident occurs there is unlikely to be one single governmental authority designated to coordinate an effective response, but rather several different agencies attempting to respond without any clear delineation of their tasks. Second, where there is no specific obligation on the country in which the accident occurs to notify other potentially affected countries within a set timeframe, notification is likely to be delayed or otherwise inadequate, with perhaps only selected information being provided. Subsequent exchange of information may also be sporadic and deficient, making it difficult for affected countries to be fully apprised of the situation. Third, there is no clearly defined procedure to follow in the event of an industrial accident that could have transboundary impacts, so the countries involved have no detailed guidance as to how they should actually respond to such accidents or liaise with one another.

A. Fragmented Regulation

The nomination of a single authority as a 'contact point', an unequivocal obligation to notify and exchange information, and a clear procedure to follow for response measures, are all essential to effective cooperation on transboundary accidents. A lack of any of these elements could quickly result in confusion and panic among the local populace, and miscommunication between the relevant authorities and neighbouring countries. This could easily lead to delays in response times and inadequate mitigation or cleanup measures. As a result, the affected countries are likely to be ill-informed and ill-equipped to take appropriate measures, problems that will be compounded by a lack of financial capacity if the relevant government has not budgeted for such eventualities.

Similarly, in relation to accident prevention measures, there would be no detailed process to follow for countries wanting to minimise the risk of accidents occurring in the first place. As the prevention of industrial accidents is even more important than their mitigation,

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[55] P Wouters, 'The Yin and Yang of International Water Law: China's Transboundary Water Practice and the Changing Contours of State Sovereignty' (2014) 23:1 RECIEL 67, 73.

this should form a key component of any country's national risk management strategy. This is particularly crucial for those countries in Asia with significant financial constraints and limited technical resources that are most at risk from transboundary impacts of industrial accidents, such as countries located downstream from major development areas in China.[56] The health, environmental, social and economic costs are likely to be far greater when there is no consistent process to follow for accident prevention and mitigation measures than would be the case if a sound regulatory framework were already in place.

Another problem is that there is currently no clear allocation of liability for the transboundary impacts of industrial accidents in Asia.[57] The broad terms of bilateral agreements on water use and environmental cooperation refer only to a general duty not to cause harm to other countries, and there are no specific provisions on which country should bear the often high costs of dealing with the transboundary effects of an industrial accident, or how these costs should be shared between the relevant parties. The issue of liability is an important one, especially given the great disparity in wealth between countries in the Asian region. Even if the internationally recognised concept of 'polluter pays' is not the preferred approach among Asian countries, some kind of liability mechanism needs to be devised to ensure fairness and clarity of responsibilities in the event of transboundary industrial accidents.

China is a particularly significant example of the need for a regulatory framework for transboundary industrial accidents among Asian countries. Given its rapid industrialisation of certain areas close to international borders and the large number of development projects it has been initiating (e.g. the 'Silk Road Economic Belt' initiative) which may have transboundary impacts if something goes wrong, China needs to give urgent consideration to the issue. As He et al observe:

> *Sharing 110 international rivers and lakes along its southwest, northwest, and northeast borders and being home to most of Asia's great rivers that flow into 18 downstream countries […], China is the most important upstream country for transboundary water and ecological security in Asia.*[58]

This is echoed by Varis et al: 'the upstream parts of several major Asian transboundary river basins […] are in China's territory, making China's water sector stresses and activities

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[56] For example, the downstream Mekong River countries of Myanmar, Laos, Thailand and Cambodia.

[57] Muratshina above (n. 18).

[58] See He *et al* above (n. 19).

particularly relevant to its neighbours.'[59] According to Wouters, more than half of the world's population live in regions dependent upon Chinese transboundary waters.[60]

B. Lack of Available Alternative International Remedies for Waterways Accidents

Against this background of regulatory insufficiency, it is important to note that China is not a signatory to the UNECE's Convention on the Protection and Use of Transboundary Watercourses and Lakes (1992) (also known as the 'Helsinki Convention'), which is open to membership by any country. This is partly attributable to China's traditional preference for addressing transboundary issues bilaterally, whether through formal treaty arrangements or 'softer' diplomatic manoeuvres. It may also be attributed to China's insistence on its sovereign rights over the transboundary waters in which it has a share, although it does appear to recognise the rights of other adjacent countries in the same waters and the duty to cooperate on relevant matters.

Therefore, if China were to experience another large-scale Songhua River-type incident with transboundary implications—which is only a matter of time—there would be no remedy available to any of its neighbouring countries under the Helsinki Convention or the Industrial Accidents Convention. Instead, once again China would likely respond through diplomatic channels and make offers of aid or compensation; it may even be prompted to enhance its bilateral arrangements with the affected country or countries. However, these measures would probably be short-term or limited in scope, rather than introducing a comprehensive framework for transboundary accident management.

Wouters contends that, '[c]oupled with its growing emergence on the world stage, the time has now come for China to demonstrate its meaningful commitment to regional peace, security and prosperity through its State practice related to its transboundary water resources.'[61] Similarly, it is in the interests of the region as a whole that China shows

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[59] O Varis *et al*, 'China's Stressed Waters: Societal and Environmental Vulnerability in China's Internal and Transboundary River Systems' (2014) 53 Applied Geography 105, 106.

[60] Wouters above (n. 55) at 74.

[61] Ibid, 75. Wouters also advocates the future 'consolidation' by China of its approach to transboundary water cooperation, particularly through ratification of relevant multilateral agreements, such as the 1997 United Nations *Convention on the Law of the Non-Navigational Uses of International Watercourses*, New York, 21 May 1997, 51st Sess., General Assembly of the United Nations, UNGA Res. A/RES/51/229 (entered into force 17 August 2014) and the 1992 UNECE *Convention on the Protection and Use of Transboundary Watercourses and International Lakes*, adopted 17 March 1992, 1936 UNTS 269 (entered into force 6 October 1996); P Wouters, 'Considering China's Approach to the UN Watercourses Convention – Time to Revisit?', International

leadership in matters of industrial accident prevention and management, as it could not only raise awareness among other Asian countries but persuade them to make a commitment also. The combined efforts of China and its neighbours in this regard would be a major improvement to regional security, minimising unnecessary conflict caused by the health, environmental and economic impacts of industrial accidents.

C. Significant Risks

The major explosions that occurred in the north-eastern Chinese port city of Tianjin on 12 August 2015 not only killed and injured hundreds of people, but released highly toxic chemicals into the air, water and soil, with local, regional and potentially transboundary impacts.[62] In the days following the incident, authorities predicted the resulting air pollution would be blown eastwards towards the Bohai Sea and the neighbouring countries of South Korea and North Korea, although past research has already shown that airborne pollutants from China can travel as far as North America.[63] In 2013, a pipeline explosion at an oil refinery in another port city, Qingdao, likewise resulted in many deaths.[64]

Although neither of these incidents have yet been shown to have transboundary effects—and raise other issues of storage, handling and transportation of hazardous substances—a similar incident occurring close to an inland political border or transboundary river could clearly have such far-reaching effects. The prevalence of major industrial accidents, wherever they occur, is a cause for great concern and even more so when they could threaten regional stability due to possible transboundary impacts. A transboundary

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Water Law Project Blog (28 July 2014). She urges the Chinese Government to develop more detailed substantive and procedural rules for water pollution as part of its broader 'War on Pollution'.

[62] According to official data, 173 people were killed and several hundred injured in the explosions. The chemicals, which were located in a dangerous goods storage facility near a residential area at the time, are thought to have included toluene diisocyanate, at least 700 tonnes of sodium cyanide, and calcium carbide: 'Authorities Yet to Identify Warehouse Contents but Greenpeace Warns of Health Risks from a Chemical Blaze', *South China Morning Post* (14 August 2015); 'Public Anger Grows as China Confirms Hundreds of Tonnes of Cyanide Were Held at Blast-Hit Port of Tianjin', *South China Morning Post* (17 August 2015).

[63] 'China Exports Pollution to U.S., Study Finds', *New York Times* (20 January 2014).

[64] The explosion occurred on 22 November 2013, when an underground oil pipeline ruptured, leaking oil into the ground and nearby sea, which subsequently caught fire. It killed at least 62 people: 'Death Toll from Qingdao Pipeline Explosion Rises to 62', *South China Morning Post* (4 December 2013).

industrial accident can easily exacerbate regional instability, particularly if the countries involved 'have overlays of past conflicts, cultural differences, or ongoing tensions'[65]

Of course, the challenge of regulating transboundary industrial accidents is by no means confined to China, as the potential for such accidents is certainly present in many other parts of Asia. For example, the 1984 gas leak that occurred at a pesticide factory in Bhopal, India, may be the world's worst industrial accident, although it did not have any known transboundary effects.[66] It is also clear, however, that 'the potential effects of industrial accidents are not limited by borders between countries or regions.'[67] The countries at highest risk are those undergoing rapid development in the absence of stringent health, safety and environmental regulations, and those downstream or directly adjacent to heavily industrialised areas. Other downstream or neighbouring countries also face some degree of risk from transboundary accidents, even if it is reduced somewhat by distance or other factors. The lack of a regulatory regime on transboundary industrial accidents could therefore leave many Asian countries vulnerable to transboundary industrial accidents like the Songhua River spill.

In addition to industrial facilities potentially affecting transboundary waterways, there are clearly risks posed by other industrial facilities that are located near political borders, as well as infrastructure projects (such as transboundary pipelines) that straddle these borders. According to Kasperson and Kasperson,

> *Hazardous facilities may be intentionally located at the edges of political jurisdictions, either to export the risk to others […], to capitalize on more permissive safety standards in an adjoining political system, or to exploit margins and peripheral regions because they are viewed as expendable and of little importance to political elites and central authorities.*[68]

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[65] JX Kasperson and RE Kasperson, 'Border Crossings', in J Linnerooth-Bayer and G Sjostedt (eds), *Transboundary Risk Management* (Routledge, 2010) 207, 211.

[66] The leak of a toxic chemical, methyl isocyanate, from a Union Carbide facility is believed to have killed thousands of people and injured many more: 'Bhopal Trial: Eight Convicted Over India Gas Disaster', BBC News (7 June 2010). The UNECE recognised the broad significance of the Bhopal disaster for the Industrial Accidents Convention in 2014: '30 years after Bhopal: UNECE countries meet to enhance industrial safety and transboundary cooperation', 26 November 2014. <http://www.unece.org/index.php?id=37492> accessed 17 August 2015.

[67] UNECE, Opening of the Convention on the Transboundary Effects of Industrial Accidents for Accession by United Nations Member States beyond the Economic Commission for Europe Region – Considerations and Options with regard to a Possible Amendment (Doc. ECE/CP.TEIA/2014/6, 4, 18 September 2014).

[68] Kasperson and Kasperson above (n. 65) at 210.

Pollution from industrial accidents at such facilities may be carried across borders through groundwater, soil or air.[69] Negative impacts from pollution migrating across borders in this way may occur more slowly and be more difficult to detect and respond to, as they are likely to be less obvious than those caused by river pollution. However, they may be no less toxic and harmful to the neighbouring country, particularly if they go unnoticed for an extended time. It is therefore equally important to have a sound management system in place to prevent and minimise the transboundary effects of all industrial facilities, regardless of whether they are situated on waterways.

III. The UNECE Framework for Transboundary Industrial Accidents as a Possible Model

Fortunately, all the elements of a strong, comprehensive framework for preventing and managing transboundary industrial accidents – including those involving waterways – have already been identified and formulated in the context of Europe, and are readily available to the international community for reference. The United Nations Economic Commission for Europe (UNECE) has developed a specific regulatory regime for its member countries, in the form of its *Convention on the Transboundary Effects of Industrial Accidents* (Industrial Accidents Convention).[70] Adopted at the same time as the UNECE *Convention on the Protection and Use of Transboundary Watercourses and Lakes* (Water Convention),[71] the rationale was that major industrial accidents could have far-reaching transboundary impacts, including pollution of shared waterways, so these linked issues should be addressed simultaneously. The UNECE had been spurred into action by high-profile major industrial accidents in Europe and the former USSR in the 1970s and 1980s.[72]

Another major industrial accident occurred in Baia Mare, Romania, shortly before the Industrial Accidents Convention entered into force in 2000. The impacts of the Baia Mare

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[69] An example of transboundary pollution occurring over a long period, rather than from a single incident, is the air pollution generated by a zinc smelter in Trail, British Columbia, Canada, which was carried across the border to Washington State, United States, giving rise to a well-known international arbitration case in the 1940s: *Trail Smelter Arbitration (United States v. Canada)*, Arbitral Trib., 3 UN Rep. Int'l Arb. Awards 1905 (1941).

[70] Helsinki, 17 March 1992, 2105 UNTS 457; in force 19 April 2000. There are currently 41 Parties to the Convention. Although the United States and Canada are both signatories, they have yet to ratify it.

[71] Helsinki, 17 March 1992, 31 ILM (1992) 1312; in force 6 October 1996.

[72] Namely, the chemical manufacturing accident near Seveso, Italy (1976), the agrochemical warehouse fire near Basel, Switzerland (1986), and the Chernobyl nuclear disaster in Ukraine (also in 1986).

cyanide spill on downstream countries[73] revealed a significant gap in international law at the time, as no mechanism existed for allocating liability and providing compensation for the transboundary effects of industrial accidents.[74] This realisation within the UNECE prompted negotiations for a new *Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters* (Civil Liability Protocol), which was subsequently adopted in 2003, although it has yet to enter into force.[75]

A. Objectives and Scope of the Convention

The key purpose of the Industrial Accidents Convention is to protect people and the environment from the effects of industrial accidents through appropriate prevention, preparedness and response measures.[76] To this end, it emphasises the need for proactive international cooperation between Parties before, during and after the occurrence of any industrial accidents with potential transboundary impacts. The Convention applies to 'industrial accidents capable of causing transboundary effects', including accidents caused by natural disasters, but it does not extend to nuclear or military accidents, dam failures, land-based transportation accidents, accidental GMO releases, or marine accidents.[77] An 'industrial accident' is defined as 'an event resulting from an uncontrolled development in the course of any activity involving hazardous substances'.[78] 'Effects' are defined broadly, as 'any direct or indirect, immediate or delayed adverse consequences caused by an industrial accident' on humans, flora, fauna, soil, water, air, landscape, material assets or cultural heritage.[79] The term 'transboundary effects' refers to 'serious effects within the jurisdiction of a Party as the result of an industrial accident occurring within the jurisdiction of another Party'.

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[73] Primarily Hungary, but also Ukraine, Serbia and Bulgaria.

[74] See M Pallemaerts, 'Study on National Legislation Needed to Implement the Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters' (Institute for European Environmental Policy, undated) 2.

[75] Kiev, 21 May 2003. The Protocol is a joint instrument to both the Water Convention and the Industrial Accidents Convention. Twenty-four countries have signed the Protocol to date, but only Hungary has ratified it.

[76] Preamble to the Convention.

[77] Art. 2 of the Convention. Most of these categories are already covered by other multilateral instruments.

[78] Art. 1(a); the threshold limits for relevant hazardous substances are specified in Annex I.

[79] Art. 1(c).

B. Key Provisions of the Convention

The Convention contains both general and more specific obligations. Article 3 imposes general duties on Parties to cooperate with one another to achieve the aims of the Convention, to take appropriate measures to prevent, mitigate and respond to industrial accidents and to reduce the risks associated with such accidents.[80] There is also a duty to ensure that industrial facility operators are required to take all necessary measures for the safe performance of hazardous activities and the prevention of industrial accidents.[81] Other broad obligations under the Convention, which are commonly found in other international environmental agreements, include the requirement to undertake research and development on methods and technologies for prevention, preparedness and response,[82] and to exchange information and technical expertise with other Parties.[83]

Specific obligations in the Convention include the requirement on Parties to identify all existing and proposed hazardous activities within their jurisdiction, as well as to notify and consult with any potentially affected Parties in accordance with the correct procedure.[84] Other specific obligations include the need to take appropriate prevention measures,[85] to integrate risk reduction into the planning approval process,[86] to maintain an adequate level of emergency preparedness,[87] to prepare (and, if necessary, to implement) on-site and off-site contingency plans,[88] to provide adequate information to the public in potentially affected areas and to allow for public participation.[89] Parties must also take adequate response measures as soon as possible after an accident (or wherever there is an imminent threat of one), using the most efficient practices to contain and minimise adverse effects.[90] Any Party needing assistance from others to respond to an accident may request it.[91]

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[80] Art. 3(1) and Art. 3(2).

[81] Art. 3(3).

[82] Art. 14.

[83] Art. 15 and Art. 16 respectively.

[84] Art. 4(1) and Art. 4(3).

[85] Art. 6(1).

[86] Art. 7.

[87] Art. 8(1).

[88] Art. 8(2) and Art. 8(3). Other potentially affected Parties must be informed and consulted on these contingency plans, which must also be kept regularly updated.

[89] Art. 9(1) and Art. 9(2).

[90] Art. 11(1). Where there are two or more affected Parties, they should conduct a joint assessment of the effects and coordinate their responses to the accident: Art. 11(2).

[91] Art. 12(1); this is known as a request for 'mutual assistance'.

Notification and consultation between Parties are key themes of the Industrial Accidents Convention. The purpose of the Industrial Accident Notification System (IANS), which was established under the Convention, is to ensure that all potentially affected Parties are promptly notified and adequately informed in the event of an industrial accident. All Parties must establish and maintain 'compatible and efficient' IANS at the appropriate levels, to ensure that responses to accidents are swift, smoothly coordinated and as well informed as possible.[92] Importantly, each Party must designate at least one competent authority to oversee implementation of the Convention at the national level,[93] as well as designate a national point of contact for all industrial accident notifications and mutual assistance requests.[94]

C. The Civil Liability Protocol to the Convention

Although the Civil Liability Protocol is yet to enter into force, some of its most distinctive features should be noted. The key aim of the Civil Liability Protocol is to ensure that adequate and prompt compensation is provided for damage caused by the transboundary effects of industrial accidents on transboundary waters.[95] The Protocol expressly endorses the 'polluter pays principle' by imposing strict liability on operators of industrial facilities for damage caused by accidents,[96] a provision which is intended to encourage them to minimise operational risks. Fault-based liability is also possible under the Protocol, making 'any person' liable for damage they have caused or contributed to by their wrongful, intentional, reckless or negligent acts or omissions.[97] Operators of industrial facilities must obtain adequate insurance to cover their liability risks.[98] In the event of an industrial accident, they are required to take 'all reasonable response measures'.[99] Individuals and entities affected

[92] Art. 10(1).

[93] Art. 17(1).

[94] Art. 17(2). The competent authorities and points of contact must remain fully operational at all times, and their details must be provided to the other Parties and the Convention Secretariat and kept regularly updated: Art. 17(5), Art. 17(6) and Art. 17(3) respectively.

[95] Art. 1.

[96] Preamble and Art. 4(1).

[97] Art. 5.

[98] Art. 11.

[99] Art. 6(1).

by industrial accidents can seek compensation from any or all of the relevant operators under the joint and several liability provision of the Protocol.[100]

D. What Could the UNECE Framework Offer to Asia?

The potential benefits for non-UNECE countries of the framework created by the Industrial Accidents Convention have already been recognised by the UNECE, albeit not specifically in the Asian context.[101] These benefits include better protection of humans and the environment from the transboundary effects of industrial accidents, as well as improved standards of industrial safety, greater investment in safer technologies and a higher rate of economic development.[102] Other benefits could include improvements to institutional, administrative and legal frameworks for accident prevention and response measures, not only in relation to transboundary effects but also in relation to local, regional and national impacts.[103] Enhanced cooperation between national authorities, industry, civil society and the public, and greater cooperation between neighbouring countries on industrial accident matters are other key drawcards.[104]

Furthermore, the Convention would provide unique opportunities for exchange of information, experiences and good practices,[105] enabling Parties to learn about both 'tried and tested' methods and novel approaches to resolving complex issues.[106] As Vinogradov and Wouters note more generally,

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[100] Art. 4(4). 'Damage' is defined broadly, and includes loss of life or personal injury, property loss or damage, economic loss resulting directly from the impairment of a legally protected interest, reinstatement costs, and the costs of response measures: Art. 2(2)(d).

[101] UNECE, Opening of the Convention on the Transboundary Effects of Industrial Accidents for Accession by United Nations Member States beyond the Economic Commission for Europe Region – Considerations and Options with regard to a Possible Amendment (Doc. ECE/CP.TEIA/2014/6, 18 September 2014) 4.

[102] Ibid, 4-5.

[103] L Wyrowski, 'Benefits of and National Legislation and Authorities for UNECE Convention on the Transboundary Effects of Industrial Accidents', Presentation to the Joint Seminar on the Espoo Convention and Industrial Accidents Convention, Ashgabat, Turkmenistan, 5-6 June 2011; UNECE above (n. 101) at 5 & 14.

[104] UNECE above (n. 101) at 5 & 14.

[105] For example, through meetings of its subsidiary bodies and technical workshops and seminars at the national and sub-regional levels; ibid, 6 & 14.

[106] Wyrowski above (n. 103).

> *[w]hen joining an international regime states do not simply become the addressees of certain rights and obligations; they take advantage of the accumulated expertise and readily available institutional mechanisms as the best means of avoiding and disarming potential conflicts.*[107]

Importantly for many Asian countries, Parties with very limited resources may also be eligible for financial and technical assistance to help them implement their obligations under the Convention.[108] Some of the Eurasian countries that are existing UNECE members - namely, Azerbaijan, Kyrgyzstan, Turkmenistan - are already beneficiaries of such assistance, for the purpose of helping them either accede to and/or implement the Convention at the national level.[109]

As can be seen from the Songhua River example discussed earlier, the Asian region is by no means immune to the threat of transboundary industrial accidents. By contrast, it is likely to be increasingly susceptible to them as long as the process of rapid development continues unchecked along the shared borders and the transboundary waterways upon which many millions of inhabitants depend for their daily living. Yet, as Adeola observes:

> *…Parties to the Convention on the Transboundary Effects of Industrial Accidents are exclusively from industrialized nations of the Global North …Conspicuously absent are the members of underdeveloped and developing societies of the Global South. India and China which have both experienced one of the worst industrial disasters in history are not Parties to the Convention.*[110]

Although membership of the Industrial Accidents Convention is not currently open to non-UNECE member countries, thereby preventing accession by most Asian countries, this is unlikely to be the only perceived impediment to Asian participation. The often-cited preference by many Asian countries for bilateral rather than multilateral cooperation generally [111] and for 'soft law' measures rather than binding legal instruments on

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[107] Vinogradov and Wouters above (n. 36) at 58.

[108] Through the Assistance Programme established under the auspices of the Convention.

[109] For example, UNECE, Report of the Conference of the Parties on its Eighth Meeting, 8th Meeting of Conference of the Parties to the Convention on the Transboundary Effects of Industrial Accidents, Geneva, 3-5 December 2014 (Doc. ECE/CP.TEIA/30, 27 April 2015) 5-6.

[110] FO Adeola, Industrial Disasters, Toxic Waste, and Community Impact: Health Effects and Environmental Justice Struggles Around the Globe (Lexington Books, 2012) 217.

[111] For example, Vinogradov and Wouters above (n. 36) at 58; K Uprety, 'A South Asian Perspective on the UN Watercourses Convention' (International Water Law Project, 2014). <http://www.internationalwaterlaw.org/> accessed 11 August 2015.

environmental issues, may seem to preclude any likelihood that the Industrial Accidents Convention would be viewed favourably in the region. However, the Convention should be regarded as complementary to existing bilateral agreements, rather than as undermining or replacing them. As such, it would be able to fill an important existing gap by providing an overarching framework for regional cooperation on transboundary industrial accidents. This is a key role which would help to ensure consistency between countries on this issue and to provide adequate protection for people and the environment in the region.

E. Could the Industrial Accidents Convention be Extended to Non-UNECE Asian Countries?

Recognising that the Industrial Accidents Convention could offer key advantages to non-UNECE countries, and thus play a major role in reducing the risks associated with transboundary industrial accidents across the world, the UNECE has been considering a proposal to open up membership of the Convention over recent years.[112] Open accession has already been achieved for other key UNECE environmental agreements over the previous decade, heralding a new role for UNECE in the broader international community.[113] The idea was first raised formally at the 7th Conference of the Parties to the Industrial Accidents Convention in 2012.[114] The general reaction of the Convention Parties was somewhat cautious, but the Working Group on the Development of the Convention was requested to evaluate the possibility further.[115]

A detailed report on the advantages and disadvantages of opening up the Convention was considered at the 8th Conference of the Parties in 2014.[116] Several Parties expressed their support for the idea, while others were concerned about the budgetary implications.[117] Given the mixed response, the Working Group was asked to 'continue thoroughly considering all aspects related to the opening of the Convention, including possible budgetary implications and to present the outcome of its considerations' at the

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[112] This would involve amending Art. 29 of the Convention.

[113] Namely, the 1991 Convention on Environmental Impact Assessment in a Transboundary Context, 1989 UNTS 309 (amended for open membership in 2001; amendment entered into force in 2014) and the Water Convention (amended for open membership in 2003; amendment entered into force in 2014). The 1998 UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, 2161 UNTS 447, together with three UNECE Protocols, have been open to all United Nations member states since they were first adopted.

[114] UNECE, Report of the Conference of the Parties on its Seventh Meeting, Stockholm, 14-16 November 2012 (Doc. ECE/CP.TEIA/24, 7 January 2013).

[115] Ibid, para. 66(g).

[116] UNECE above (n. 101).

[117] UNECE above (n. 109).

Ninth Conference of the Parties in 2016. By mid-2015, the Working Group had formulated the draft text for a proposed amendment to the Convention facilitating accession by non-UNECE countries.[118] Although it may be some time before a formal decision is made to adopt such an amendment, there is a distinct possibility that accession to the Industrial Accidents Convention will be opened up to the rest of the world in coming years.

F. Feasibility of Ratification for Asian Countries

Although the limited scope of this article precludes a more detailed analysis of existing relevant laws in all Asian countries, it is prudent to ask whether they would be in a position to ratify the Industrial Accidents Convention should the opportunity arise in the future. Looking at the example of China, the question is whether there are sufficient domestic legal provisions in place, or at least in progress, to enable its Government to consider ratification. While it is, of course, difficult to determine what is 'sufficient', it is possible to compare China's main provisions on emergency preparedness and response measures briefly with the key provisions of the Convention.

The quite detailed measures in China's Emergency Response Law (2007) for emergency prevention, preparedness and response correspond to some degree with the duty in Article 3 of the Industrial Accidents Convention to take appropriate measures to prevent, mitigate and respond to industrial accidents with potential transboundary effects (for example, Chapters II, III and IV). Articles 20 and 23 of the Emergency Response Law impose obligations for the identification of (and specific planning for) certain hazardous sites and activities, somewhat similarly to Article 4 of the Convention, although the latter additionally requires affected States to be notified of such sites.

Articles 10, 20 and 44 of the Emergency Response Law contain limited provisions for notifying and informing the public regarding hazards and accidents, which are not as comprehensive as Article 9 of the Convention. The latter imposes an obligation on governments to not only consult with their own public – actively seeking their views and participation – but also to inform and to involve populations in other affected countries. Neither of these appear to be required under China's Emergency Response Law, although it could be amended to allow for that if the Chinese Government were to adopt a more favourable attitude towards public participation in the future.

Another comparison that can be drawn is between the requirement to designate 'one or more competent authorities' within each country to coordinate all of its accident

[118] Working Group on the Development of the Convention, Options for an Amendment to the Convention on the Transboundary Effects of Industrial Accidents, Fifth Meeting of the Working Group, Geneva, 11-13 May 2015 (Doc. ECE/CP.TEIA/WG.1/2015/4) 13.

prevention, preparedness and response measures (Article 17 of the Convention), and the rather complex distribution of tasks among various layers of government authorities under the Emergency Response Law (e.g., Article 7). Parties to the Convention are generally expected to have one single authority with overall responsibility for relevant matters, particularly for the purposes of the industrial accident notification system. The Chinese Government would need to make significant changes to the Emergency Response Law to consolidate and streamline the responsibilities of authorities in this regard. Importantly, however, the Emergency Response Law already contains procedures for many aspects of accident prevention, preparedness and response, and these could feasibly create a foundation for further measures that would correlate more closely with the requirements of the Convention.

If certain improvements could be made to the Emergency Response Law, and if new legislation or bilateral agreements could made to reflect the transboundary notification and consultation requirements of the Convention, China would be in a better position to ratify the Convention. By showing leadership on this issue, China may also influence its neighbours and other Asian countries to introduce similar measures and to eventually ratify the Convention also.

G. Using the Convention as a Benchmark

Prior to possible expansion of membership in the future, there is nothing to prevent non-UNECE countries from using the provisions of the Convention as a reference point for the adoption of similar (or identical) measures at the national level. Notwithstanding its origins in Europe, the Convention already comprises a workable model that could be adopted (and, if necessary, adapted) by any country without major difficulty. The short-term goal would be for domestic measures to be developed to closely reflect the framework and provisions of the Convention, such that formal accession—if and when it becomes possible—and implementation at a later stage would be relatively straightforward. Even if open accession is not eventually approved by the UNECE, any countries that have chosen to adopt provisions based on the Convention model would still be significantly better off for having done so. Whether it is economically and technologically feasible for Asian countries, in particular, to adopt the provisions of the Industrial Accidents Convention in their own domestic contexts, is ultimately a question for the governments of those countries. However, it is very likely that either the UNECE or other international organisations would offer both financial and technical assistance to help overcome any such hurdles.

H. The Existing Role of the Convention in Central Asia

It should be noted at this stage that the Industrial Accidents Convention already plays a role, albeit a very limited one, within some parts of Asia. Five countries in Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan), one in Western Asia (Israel) and Russia are all UNECE Member States. Of these, only Russia and Kazakhstan are Parties to the Industrial Accidents Convention, although sustained efforts are being made by the UNECE to promote accession by its other Central Asian Member States, with Kyrgyzstan perhaps the most likely to accede in the near future.[119] Since 2004, the UNECE has had an Assistance Programme in place to enhance the capacity of these countries to implement the requirements of the Convention. Through this programme, numerous fact-finding missions, workshops, seminars and conferences have been held by the UNECE in Central Asia, reflecting a special emphasis on 'tailor-made' assistance for economies in transition.[120] The UNECE is likely to intensify its efforts to promote accession and implementation by these four Central Asian countries into the future.[121]

If the Industrial Accidents Convention is ultimately adopted by all of the Central Asian countries, this may have a positive influence on other Asian countries, particularly those neighbouring Central Asia and Russia. It would undoubtedly be easier to promote the advantages of the UNECE framework to these countries and initiatives like the Assistance Programme may play a key role in 'reaching out' to non-Parties, both to raise awareness of transboundary industrial accidents and to encourage regional (if not multilateral) cooperation. Once other Asian countries can see the tangible benefits of a comprehensive regulatory regime on the issue, they may be persuaded to take action at the domestic level. If membership of the Convention is one day opened up to non-UNECE Parties, accession would be more straightforward for countries that are already familiar with the issues and the framework designed to address them.

Conclusion

Major industrial accidents, such as the Songhua River example in China, can have significant transboundary effects if they occur on a shared waterway or near a political boundary. Although only a few of the industrial accidents that have occurred in Asia to date have had known transboundary impacts, the potential for this is ever-present. Recent

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[119] See for example, UNECE above (n. 109).

[120] See for example, UNECE, A Decade of Assistance to Countries in Eastern and South-Eastern Europe, the Caucasus and Central Asia: Lessons Learned and Future Prospects (Doc. ECE/CP.TEIA/2014/5, 24 September 2014) 7.

[121] Ibid.

development initiatives by the Chinese Government, and the proliferation of industrial facilities in many parts of Asia generally, give particular cause for concern. China is typical of other Asian countries in preferring to take a bilateral approach to transboundary environmental issues rather than cooperating at a regional or multilateral level. At the same time, however, the existing bilateral agreements do not contain detailed provisions for cooperation in the event of transboundary industrial accidents. They tend to contain only broad obligations to refrain from causing harm and to cooperate with one another. Although some domestic laws (again using the example of China) have provisions on emergency planning and response measures, they do not stipulate how such measures are to be coordinated with neighbouring countries in the event of a transboundary accident.

The lack of any specific regulatory regime for the prevention and management of industrial accidents and their transboundary effects leaves many Asian countries susceptible to major impacts in the future. The potential costs of such accidents in terms of human health, the environment, and socio-economic and political implications, are likely to be high. Recognition of these risks following major industrial accidents in Europe in the 1980s and 1990s led to the development of a new multilateral agreement by the UNECE, the *Convention on the Transboundary Effects of Industrial Accidents*. The Convention provides a comprehensive regime for industrial accident prevention, preparedness and response measures. Importantly, it also provides for a consistent, systematic notification procedure between countries in the event of a transboundary accident. Countries that implement the Convention therefore have the benefit of detailed procedures to follow at both the domestic level and when interacting with other countries. Their obligations to one another are clearly stated in the Convention.

Although the Industrial Accidents Convention currently plays only a very limited role in Asia, as its membership is confined to UNECE countries, this may change in the future. Discussions are underway within the UNECE as to whether membership of the Convention should be opened up to all countries, and the many potential benefits of accession for non-UNECE countries have already been recognised. Given that Russia is already a Party to the Convention, and the five Central Asian UNECE countries may accede to it in coming years, the rest of Asia is likely to become more aware of its advantages also. Traditional preferences among many Asian countries for bilateral, rather than multilateral, cooperation on transboundary environmental issues need not be viewed as an obstacle to joining the Convention.

The Convention is perhaps best seen as playing a complementary role to existing bilateral efforts between Asian countries rather than replacing them. As such, it can provide both an overarching framework and more detailed guidance where domestic or bilateral provisions are inadequate or silent on particular aspects. The Convention would also be a

valuable forum for exchanging knowledge and experience, in addition to providing technical and financial assistance for the more disadvantaged countries in Asia. However, regardless of whether it becomes possible for non-UNECE countries to accede to the Convention, it provides a framework to which Asian countries can readily refer when formulating their own domestic responses to the issue of transboundary industrial accidents. It is to be hoped that such measures will be proactive in nature, rather than simply reacting to yet another Bhopal or Songhua disaster.