



CHINA WATER
RISK

Water: The New Business Risk

Part III – Managing Water Risk

March 2010

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1. Managing Water Risks

1.1 Environmental Management

Water scarcity has to be confronted watershed by watershed, according to local physical and political conditions...

Source: Water the epic struggle for wealth power and civilization, Steven Solomon, 2010

In the past, companies managing their water use and waste water discharges have generally done so as part of a corporate environmental management initiative or a more formal environmental management system (EMS). Environmental management, which includes water resource management, has been part of the business landscape for more than two decades and in large part has been driven by the now internationally recognised environmental management standard: ISO14001:2004 Management System Standard with Guidance for Use (initially published in 1996) and the European Eco-Management Audit Scheme (EMAS). In principle, these standards introduced in the mid-nineties apply the simple and familiar management philosophy of Plan, Do, Check, Act, which translates to identifying a company's significant environmental aspects, the implementation of a system of control, monitoring, corrective action and emergency response. It is worth noting that China has one of the highest numbers of companies certified to ISO 14001 globally¹.

For such companies operating in a water stressed environment, a water intensive company operating in China would almost certainly identify water consumption and effluent discharge as environmental aspects that need to be managed. The EMS should document the necessary management procedures.

While such management systems can manage day to day water risk and seek to achieve continual improvement in environmental performance, they will not necessarily result in forward-looking corporate strategies of the type that water crises demand. Nor will they provide the methodologies needed for companies to develop a water management system. However such an approach can provide a sound framework for water management.

1.2 Approach to Water Management

In general, the principles of water management include:

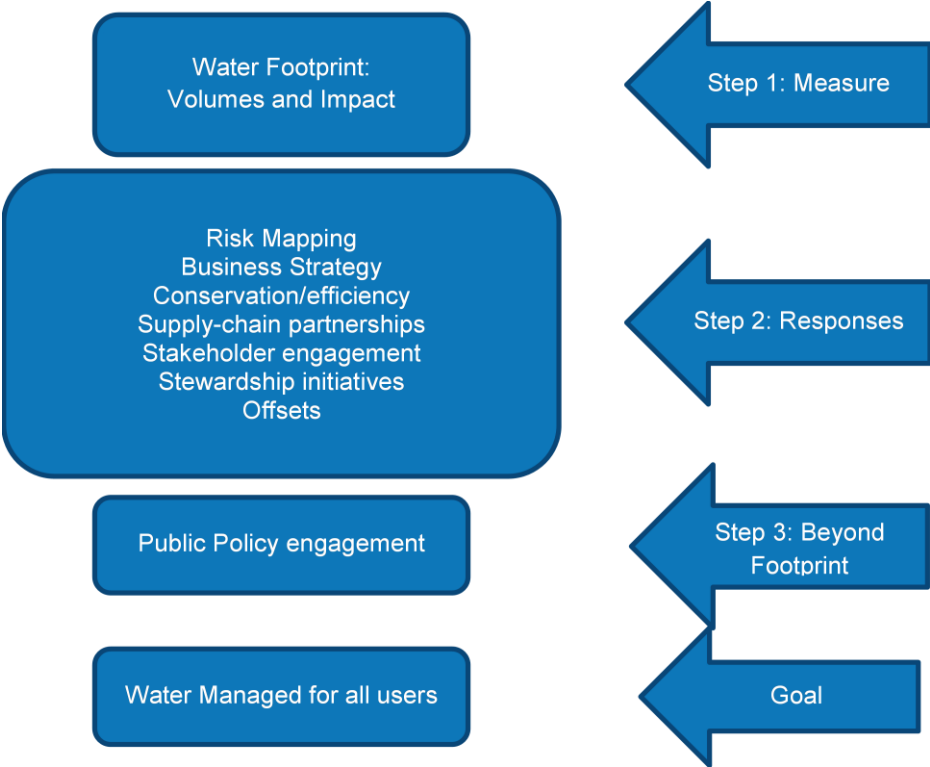
- identification of risk through the quantification of water use and discharges, including assessment of impacts on the company, communities and the environment;
- risk analysis and prioritisation, such that high-risk areas may need to be addressed first;
- the development of policies, dynamic management plans and initiatives to control risk and improve performance;
- integration into any existing management system framework; and
- development of a forward-looking, sustainable corporate water strategy.

Experts have come a long way in reviewing and consolidating information to help companies better understand water-risk management and make use of the methodologies and tools available.

¹ At the beginning of 2007, 20,000 companies were certified, ranking China second highest in the world

In March 2009, the CEO Water Mandate (see Box 1), in collaboration with WWF and the Pacific Institute, mapped the measures a growing number of companies have been taking to address water issues. The result is a roadmap (see diagram below) that tracks the different stages companies go through to identify and manage water risks. The diagram and associated discussion points are extracted from the CEO Water Mandate’s 2009 Discussion Paper entitled, *“From Footprint to Public Policy: The business future for addressing water issues.”*

Figure 1: Business ‘Roadmap’ to Water Risk Identification and Management



Source: CEO Water Mandate, “Discussion Paper, From Footprint to Public Policy: The business future for addressing water issues,” March 2009.

Box 1: The CEO Water Mandate on Water Management

A UN Global Compact initiative designed to help the private sector understand and address its water-related issues, points out that the effective management of water-related risks is considered more challenging than other environmental issues because of water's multi-dimensional characteristics:

- Its availability, management and impacts are local at a watershed or basin level, thus business risk around water is fundamentally related to location and exposure to water stress at a catchment or local level.
- It is typically variable in space and time, with a high degree of uncertainty about future changes.
- The availability for use is constrained and often with complex rights and undeveloped pricing-market systems.
- It is both an economic and public good, with significant socio-political implications.
- Freshwater ecosystems are vulnerable to and are highly interconnected with human activities.

The CEO Mandate also refers to trends, such as rising water demand from increasing population and economic growth, decline of water quality in many regions, climate change exacerbating water scarcity and quality issues and the dependency on already constrained energy supplies for the delivery and treatment of water, which all add to the complexity of water management.

Ultimately this means that there can be no one solution for companies seeking to manage their risks and instead they will need to employ a wide array of measures from “water footprint assessments to public policy engagement, in order to solidify meaningful and lasting outcomes¹.” While this whole process should apply to a company's supply chain and indeed its entire value chain, this may appear too onerous and in practice companies may first address their direct operations.

Source: Discussion Paper, From Foot Print to Public Policy, The CEO Water Mandate, March 2009 (www.unglobalcompact.org/Issues/Environment/CEO_Water_Mandate/),

1.3 Water Footprinting

An important term to understand in the field of corporate water management is ‘water footprinting’. Historically the term ‘water footprint’ has been used in reference to the volume of water that an organisation consumes and this is embodied in the Water Footprint Network's (WFN) (www.waterfootprint.org) widely recognised methodology.

However, in recent years ‘water footprint’ methodologies have been developed that in addition to establishing volume of water use, go on to assess risks and impacts and the term is now frequently used in this broader context. As a result there is some confusion over the use of the terminology. Unless otherwise specified, CWR uses “footprint” as a generic term to distinguish it from the formal methodology currently managed by the Water Footprint Network.

Box 2: Water Footprinting (as defined by Water Footprint Network)

The water footprint (as defined by WFN) is an indicator of freshwater use that looks at both direct and indirect water use of a consumer or producer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business.

Water use is measured in terms of water volumes consumed (evaporated) and/or polluted per unit of time. A water footprint can be calculated for a particular product, for any well-defined group of consumers (e.g. an individual, family, village, city, province, state or nation) or producers (e.g. a public organisation, private enterprise or economic sector). The water footprint is a geographically explicit indicator, not only showing volumes of water use and pollution, but also the locations.

According to the Water Footprint Network, a water footprint measures three primary components:

Blue water footprint - the volume of surface and groundwater consumed as a result of the production of a good or service. Consumption refers to the volume of freshwater used and then evaporated or incorporated into a product. It also includes water abstracted from surface or groundwater in a catchment and returned to another catchment or the sea. It is the amount of water abstracted from ground- or surface water that does not return to the catchment from which it was withdrawn

Green water footprint - the volume of rainwater consumed during the production process. This is particularly relevant for agricultural and forestry products (products based on crops or wood), where it refers to the total rainwater evapotranspiration (from fields and plantations) plus the water incorporated into the harvested crop or wood

Grey water footprint - an indicator of freshwater pollution that can be associated with the production of a product over its full supply chain. It is defined as the volume of freshwater that is required to assimilate the load of pollutants based on existing ambient water quality standards. It is calculated as the volume of water that is required to dilute pollutants to such an extent that the quality of the water remains above agreed water quality standards.

Source: Water Footprint Network (www.waterfootprint.org).

Water Footprinting is often a complex and can be a time consuming undertaking. To best mitigate immediate water risks, some experts believe that identifying “hot spots,” those areas where water risks are most pressing, (be it for physical, regulatory or reputational reasons) is a critical first step.

Assessing these immediate risks before completing a water footprint helps companies prioritise their water management plans. WRI's forthcoming Water Index is an example of a methodology that tackles water risk from a localised perspective. The Index will offer one of the most expansive measures of water risks currently available. It will aggregate nearly 20 weighted factors capturing water availability, regulations, water quality and reputational **issues**.

What is Virtual Water?

A relatively new concept that has some similarities with the water footprint is 'virtual water'. As with the water footprint, virtual water refers to the volume of water consumed or polluted for producing the product, measured over its full production chain. If a nation exports/imports such a product, it exports/imports water in virtual form.

Water Footprinting in Context

As an example of understanding exposure to water risk, McKinsey and Company recommend²: The first step to managing the risk is to quantify it. This should begin with creating a water footprint and overlaying it on areas of extreme water scarcity to reveal risk exposure

- The water footprint map accounts for current and future water intensity of cultivation and production by origin of inputs, water usage and infrastructure in production, distribution and sales
- Once all three are mapped, anticipated changes in supply can show where water demand will rise along the value chain
- The analysis should be supplemented by interviews with local plant managers to understand their experience and hypotheses about water scarcity.

Figure 2: Relative Water Footprint of Various Industry Sectors

	Raw Material Production	Suppliers	Direct Operations	Product Use/End of Life
Apparel	  			
High-Tech/Electronics				
Beverage	 			
Food	 		 	
Biotech/Pharma				
Forest Products			 	
Metals/Mining	 		 	
Electric Power/Energy	 		 	

Source: CERES/Pacific Institute, "Water Scarcity and Climate Change, Growing Risk for Business and Investors," 2009
Water drops indicate the value chain segments that have relatively high blue, green and gray water footprint intensities.

1.4 Water Management Initiatives and Tools

As water rises in the global policy arena, this is accompanied by the development of tools and initiatives, most of which are global as well as applicable to China. CWR has compiled a list of these resources that is not intended to be exhaustive,

² The Global Corporate Water Footprint- risks opportunities and management options, Mckinsey and Company , October 2009
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nor is the inclusion of an initiative or tool an indication of its merit. CWR has made use of the following resources and consolidated information in Figure 3:

- **February 2008:** the Pacific Institute mapped global freshwater initiatives in a paper for the CEO Water Mandate³.
- **November 2009:** as part of the United Nations Environment Programme's (UNEP) Water Footprint, Neutrality and Efficiency (WaFNE) Umbrella Project, the CEO Water Mandate dug deeper into trends in corporate water accounting and undertook a stock taking of existing methodologies and tools⁴.
- **March 2010:** the World Business Council for Sustainable Development (WBCSD) published an overview of business-relevant initiatives on water management including guidelines, tools, measurement methodologies, communication and stewardship schemes. The aim being to provide a structured overview of major initiatives to understand who is doing what and help build a common language⁵.

Figure 3: Relevant Tools and Initiatives

Organisation	Initiative	Tools	Measure water use and impact	Identify risks and opportunities related use and impacts	Developed response options
Alliance for Water Stewardship: www.allianceforwaterstewardship.org/	Alliance for Water Stewardship Est. 2008		✓		✓
Beverage Industry Environmental Roundtable: www.bieroundtable.com		BIER Water Footprint Working Group: Created 2009	✓		
Business Roundtable: http://waterbrief.businessroundtable.org/About/	Water Brief for Business – The S.E.E. Change Initiative Est. 2007			✓	✓
Business for Social Responsibility (BSR): http://www.bsr.org/en/our-work/working-groups	BSR Apparel Water Quality Working Group Est. 2007				✓
Carbon Disclosure Project (CDP): www.cdproject.net/en-US/Pages/HomePage.aspx	CDP Water Disclosure Project Est. 2009			✓	
Center for Sustainable Innovation: www.sustainableinnovation.org		Corporate Water Gauge: Created 2009	✓		
Global Environment Management Initiative (GEMI): www.gemi.org		Collecting the Drops: A Water Sustainability Planner: Created 2007		✓	

³ Mapping Global Freshwater Initiatives: Background Paper for the CEO Water Mandate, Pacific Institute, February 2008

⁴ Corporate Water Accounting. An Analysis of Methods and Tools for Measuring Water Use and Its Impact, CEO Water Mandate, November 2009.

⁵ Water for Business : Initiatives guiding sustainable water management in the private sector, version 2, March 2010

Organisation	Initiative	Tools	Measure water use and impact	Identify risks and opportunities related use and impacts	Developed response options
Global Reporting Initiative (GRI): www.globalreporting.org		GRI Water Performance Indicators and Protocols: Created 2002	✓	✓	✓
International Organisation for Standardisation (ISO): www.iso.org		ISO Water Footprints, Principles and Requirements Guidance: Created 2009	✓		✓
UN Environment Programme (UNEP): www.unep.fr/en/about/index.htm	UNEP Water Footprinting, Neutrality and Efficiency (WaFNE) Project Est. 2009		✓	✓	✓
UNEP/SETAC: www.lcinitiative.unep.fr/	Life Cycle Initiative – Project Group on Water Use Assessment Est. 2008		✓		
UN Global Compact: www.unglobalcompact.org	CEO Water Mandate Est. 2007				✓
Water Brief for Business: www.waterbrief.businessroundtable.org		Water Brief for Business: Created 2005		✓	
Water Footprint Network: www.waterfootprint.org	Water Footprint Network Est. 2008		✓		
WaterSense Programme: www.epa.gov/WaterSense		WaterSense Programme: Created 2006			✓
Water Stewardship Initiative: www.waterstewardshipinitiative.com	Water Stewardship Initiative Est. 2007			✓	✓
Water Use within Life Cycle Assessment (WULCA):		Water Use with Life Cycle Assessment: Created 2007		✓	
World Business Council on Sustainable Development (WBCSD): www.wbcsd.org	WBCSD Water Project Est. 1997	WBCSD Global Water Tool: Created 2007	✓	✓	
World Economic Forum (WEF): www.weforum.org	WEF Water Initiative Est. 2008			✓	
World Resources Institute (WRI)/Goldman Sachs/GE: www.wri.org		Aqueduct		✓	

World Resources Institute Aqueduct Initiative

(www.projects.wri.org/aqueduct)

Specifically relevant to China, the World Resources Institute (WRI) has developed a tool specifically for Measuring and mapping water risk: Aqueduct. With support from Goldman Sachs and General Electric, the initiative was launched in 2009 to capture risks facing companies and their investors, piloting with the thermal power industry along the Yellow River in China.

The aim of which is “to provide companies and their investors with the actionable information they need to effectively manage and reduce their exposure to water risk. Aqueduct can also highlight potential problem areas and facilitate engagement between public and private stakeholders seeking to address water risks⁶.

The tool is a hierarchy of indicators of water availability, water quality, regulatory and reputational risks. These risks are weighted depending on their relevance for a particular sector or industry or even company and, with maximum transparency, aggregated for a specific river basin (since “all risk is local”).

The tool and the associated mapping facility rely on publicly available data in order to maximize its replicability. “From a technology perspective, solutions to enable water reuse and mitigate risk already exist,” says Heiner Markhoff, president and CEO for GE Power & Water. “Advanced solutions, such as membrane technology and water-efficient cooling technologies are available to manage the risks once these are identified and measured, which is what the Water Index aims to do.”

Box 3: BSR Works with Big Brands on Supply Chain

In 1995, BSR brought together global apparel and retail companies to develop and implement responsible practices around water use and wastewater discharge in textile and apparel supply chains. Formerly known as the Apparel Water Quality Working Group (AWQWG), today the Sustainable Water Group is a partnership of nine global apparel companies: Coldwater Creek Inc.; The Gap Inc.; H&M Hennes & Mauritz AB; JCPenney; Levi Strauss & Co.; L.L.Bean Inc.; Nike, Inc.; Nordstrom, Inc.; and Timberland. This group has developed Water Quality Guidelines that aim to mitigate the potential harmful impacts and business risks faced by companies operating around the world, where regulations and enforcement can vary dramatically from country to country.

Through this working group, BSR worked with member companies to select and facilitate visits to factories to conduct informal surveys related to water use and discharge. The overall objective of the comparative study among factories was to understand and characterise the relationship dynamics between global brands and their suppliers.

⁶ <http://projects.wri.org/aqueduct>

2. Case Studies

In this section, CWR provides examples of corporate action on water, focusing specifically on water management strategies. The following case studies are provided below. As we expand the CWR portal, additional case studies will be added.

- Nike
- Nestle
- GlaxoSmithKline
- The Coca-Cola Company

The case studies are partly based on a 2010 investor report entitled, “Water in China: Issues for Responsible Investors,” by the Asian investment research group, Responsible Research, and other website sources.

Nike

Nike looks at water use and discharges in its supplier factories and recommends that their own suppliers comply with the regulations of Nike’s apparel water programme, which is often stricter than local or national regulations. The Nike Water Programme started with a handful of apparel dyeing and finishing facilities. The programme has since grown to include more than 200 suppliers. It began with 55 facilities in FY01 and has grown to include 403 facilities in FY09. This represents nearly two-thirds of the manufacturing facilities in Nike’s apparel system and includes the most water-intensive facilities such as textile mills, dyeing and finishing facilities and vertically integrated factories. The Water Programme now collects more specific production and water use data and Nike is beginning to develop metrics to critically evaluate water use and improve water management.

Nike developed its guidelines through its work with the Business for Social Responsibility (BSR) Apparel Water Quality Working Group (see Box 3). This effort took advice from the academic and scientific community to set goals for water quality and focused on training, reducing ‘audit fatigue’ for suppliers and collaboration on best practices in wastewater treatment and water conservation.

Apparel suppliers to Nike in China have to complete a questionnaire and provide copies of their discharge permits, water quality regulations specific to their location and test results from an accredited laboratory demonstrating compliance. The company then evaluates suppliers based on both the quantity and quality of wastewater and then ensures that the suppliers have enrolled their main subcontractors in the programme. Although water use is considerably less in footwear factories, the company also conducts extensive, quarterly wastewater audits on all Nike contract footwear factories in China.

In 2009, Nike introduced a web-based reporting tool that will allow suppliers to enroll in the water programme online, check their ratings, upload current permits and regulations and provide updated test results for annual reviews. It is hoped that this tool will enable all apparel, footwear and equipment suppliers to be part of this self-reporting programme, enabling the Nike team to focus attention on conservation and sustainability innovation.

For more information, visit: www.nikebiz.com/crreport/content/environment/4-3-7-water.php?cat=water

Nestlé

Nestlé China has highlighted water as being among its top three environmental priorities; the other two are energy and packaging.

Globally, it is involved in improving water management in agriculture and access to clean water in rural areas. Water management, particularly the overall reduction and treatment of wastewater, is now a key part of Nestlé's environmental strategy globally. It has reduced global consumption of water in its factories by 30% over the last decade, while increasing production by 68%. It is now focused on water-saving initiatives where the company will have the most impact at a local level, e.g. in Pakistan or China, primarily by teaching and promoting new technologies within the supply chain. Nestlé is also developing an internal water stress index, combining a national-level Water Poverty index with a local-level index near factory locations.

From 1999 to 2008, Nestlé China reduced its water consumption per tonne of product by over 50%, with the aim of a further withdrawal reduction of 2-3% over the next five years. The Government of Harbin named its Shuangcheng factory a top 'Water Conservation Enterprise', while Nestlé Sources Shanghai Ltd. Won the 'Water Saving Enterprise Award' from the Shanghai Water Affairs Bureau in 2009.

Nestlé has been involved in the production of bottled water in China since 1997. In 2009, Nestlé Waters committed to reduce water consumption per liter of water produced by 5%. It claims to be one of the most efficient water users in the beverage industry, cutting the water needed for its operations by 34% in the last six years.

The company is also involved in the research and promotion of sustainable agricultural techniques and technologies. In China, its involvement in sustainable agriculture has mainly involved the use of cheap, moderately-sized biogas digesters for manure storage, preventing contamination of ground water. Nestlé has also helped to train farmers throughout China to install over 1,500 small biogas plants, limiting pollution of water sources and creating energy sufficient for basic activities, such as cooking. In 2005, the Shuangcheng factory pioneered a project to use water from fresh milk production in boiling and cooling towers, and for cleaning in the factory, reducing the total water usage by 23%.

Nestlé's online Water Management Report is found at www.nestle.com

GlaxoSmithKline

GSK is a CEO Water Mandate signatory. In order to minimize its global impact on water, the company aims to reduce water consumption by 2% per annum per unit of sales. In 2008, it managed to decrease its water use by over 10% from 2006, mostly through facilities maintenance and conservation.

GSK acknowledges the part it must play in conserving water for its future operations in China to be successful. It uses water in its pharmaceutical production process (for manufacturing, cooling and cleaning) and for general site uses, including drinking, food services and sanitation. Although R&D sites and offices use relatively little water, sites that manufacture active pharmaceutical ingredients can use large amounts. GSK plans to expand its programme on water usage reporting to collect and report water usage from its key suppliers. The company has also worked with local communities to conserve water and preserve wetlands.

For more information, visit: www.gsk.com/responsibility/water-use.htm

The Coca-Cola Company

The Coca-Cola Company has a stated aim to 'safely return to nature an amount of water equivalent to that used in all beverages and its production.' In 2007, they partnered with World Wide Fund for Nature (WWF) to develop a programme to support water conservation globally. One of the key goals of the partnership is to improve water efficiency in manufacturing plants by 20% by 2012, with the intention of becoming the most efficient user of water among peer companies. The partnership is also working to measurably improve conservation in seven key freshwater basins, one of which is the Yangtze River.

To improve water efficiency at its plants, Coca-Cola has introduced an interactive toolkit that allows bottling plant managers to understand where the water they use goes and to compare this to other plants. The company aims to return 100% of wastewater back to the environment, treated to a standard that can support aquatic life. This must be in accordance with local laws and regulations and, if municipal treatment facilities are not sufficient, on-site treatment systems must be constructed. By 2007, 85% compliance with strict internal standards was achieved, with the aim of 100% compliance by 2010.

In addition to monitoring water usage and wastewater in production, Coca-Cola is now leading the field in considering water usage within the supply chain. Initially its focus is on sugarcane, a crop that requires about 180 litres of water for the sugar required to produce 1 litre of Coke. The company has also issued Water Scarcity Guidelines and revised its Standard for Source Water Protection in order to address the increasing risk factor of water scarcity within its business.

For more information, visit:

www.thecoca-colacompany.com/citizenship/water_main.html

Wal-Mart

In July 2009, Wal-Mart announced plans to build an ambitious, worldwide sustainable product index. The index is meant to establish a single source of data for evaluating the sustainability of products. In October 2009, the company released a 15-question assessment, which looks into water use, the carbon footprint and the ethical business practices of its supply chain, which amounts to over 100,000 suppliers. The evaluation will form the basis for developing the index.

The company is also helping to create a consortium of universities that will collaborate with suppliers, retailers, NGOs and government to develop a global database of information on the lifecycle of products — from raw materials to disposal. Wal-Mart has provided the initial funding for the Sustainability Index Consortium and has invited all retailers and suppliers to contribute.

If Wal-Mart is successful, this Index is a game-changer. Given Wal-Mart's extensive supply chain mainly based in Asia, and with the majority in China, any reporting and mitigating of water risks will have a significant impact on water conservation efforts.

For more details, visit: <http://walmartstores.com/FactsNews/NewsRoom/9277.aspx>



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Appendices

APPENDIX I

Key Regional and Global Efforts

Global Efforts:

Government and Multilateral Organisations

- Asian Development Bank - Water For All (<http://www.adb.org/water/>)
- Berlin Rules on Water Resources (http://www.internationalwaterlaw.org/documents/intldocs/ILA_Berlin_Rules-2004.pdf)
- EU Water Initiative (<http://www.euwi.net/about-euwi>)
- European Union Water Framework Directive (http://ec.europa.eu/environment/water/water-framework/index_en.html)
- UN Environment Programme (WaFNE project)
- UN General Comment 15, CESCR, on Right to Water (http://www.worldwatercouncil.org/index.php?id=1764&L=0target%3D_blank#c9490)
- UN Millennium Development Goals (www.un.org/millenniumgoals)
- UN Principles for Responsible Investment (UNPRI) (<http://www.unpri.org/>)
- UN Water (<http://www.unwater.org/>)
- World Economic Forum Water Initiative (www.weforum.org/pdf/water/WaterInitiativeGlance.pdf)
- World Water Council/World Water Forum (<http://www.worldwatercouncil.org/index.php?id=1&L=0%255D>)

Public Private Partnerships

- 2030 Water Resources Group (www.mckinsey.com/clientservice/water/charting_our_water_future.aspx)
- CEO Water Mandate (www.unglobalcompact.org/issues/.../CEO_Water_Mandate/)

Investor Driven & Supported Initiatives

- Carbon Disclosure Project Water Disclosure (www.cdproject.net/water-disclosure)
- Coalition of Environmentally Responsible Economies (CERES) (<http://www.ceres.org/Page.aspx?pid=415>)
- UN Principles for Responsible Investment (UNPRI) (<http://www.unpri.org/>)

NGO's, Non Profits and Alliances

- Alliance for Water Stewardship (www.allianceforwaterstewardship.org)
- Business for Social Responsibility - Sustainable Water Group (<http://www.bsr.org/en/our-work/working-groups/sustainable-water-group>)
- Business Roundtable Water Brief for Business (<http://waterbrief.businessroundtable.org/About/>)
- Global Reporting Initiative (GRI) (www.globalreporting.org/)
- Global Water Environmental Management Initiative (<http://www.gemi.org/gemihome.aspx>)
- Greenpeace China (www.greenpeace.org/china/)
- Water Footprint Network (www.waterfootprint.org/)
- Water Witness International (www.waterwitness.org/)
- World Business Council for Sustainable Development (www.wbcsd.org/web/watertool.htm)
- World Resources Institute (WRI) (<http://www.wri.org/>)

Regional :

Public-Private Initiatives

- CEO Water Mandate – China Signatories
- Aluminium Corporation of China
- Baosteel Group China
- Hong Kong Beijing Air Catering

NGOs

- 1994 Friends of Nature, Beijing (www.fon.org.cn)
- 1996 Green Earth Volunteers, Beijing (www.eng.greensos.cn)
- 2001 Huaihe River Guardian, Yunnan (www.huaihe.org)
- 2002 Green Hanjiang (Xianfan Environmental Protection Association), Hubei (www.greenhj.org.cn)
- 2004 Green Camel Bell, Gansu (www.gcb.ngo.cn/en/)
- 2006 Institute of Public and Environmental Affairs (IPE, www.ipe.org.cn/En)
- 2008 Green Choice Alliance (GCA), a coalition of 34 Chinese environmental NGOs was formed focusing on addressing pollution in manufacturers' supply chains (www.ipe.org.cn/En/alliance/)

APPENDIX II

Guidance on Business ‘Roadmap’ to Water Risk Identification and Management

Step 1: Measure

- In order to accurately assess risks, companies typically conduct an accounting exercise to understand water use and wastewater discharge, ideally throughout their value chain.
- Many businesses measure their water use using both life-cycle assessment (LCA) and water footprint analyses.
- The results of the accounting can provide the basis for the evaluation of “relative risks” and help companies prioritise management efforts and set strategic goals.
- On a regionally-specific basis, companies will need to assess impacts associated with their water footprint by looking at factors including: shortage and flooding risks; trends in regional demand; institutional or political water governance capacity; local and regional water access and pricing; impacts of companies’ water use and wastewater discharge on local communities and ecosystems; and climate trends.

Step 2: Responses to drive down risk – responses are designed to reduce risk and maintain a license to operate

Water Efficiency

- As a first step, many companies focus on reducing their direct water footprint by conserving and recycling water within their own operations, as well as managing water quality by reducing wastewater discharges and pre-treating discharged water.
- Efficiency measures at the factory level are quite advanced in many companies and businesses are sharing common technologies and innovations to reduce and recycle water and return, in many cases, cleaner water to the environment.
- At a field level, more nuanced approaches for the best practices in that hydrological system are required, depending on the conditions and appropriate irrigation requirements and techniques.
- Full-cost accounting is a method that can also be used to evaluate and compare potential water strategies and management measures. It is based on a life-cycle approach and aims to identify and quantify all internal and external environmental and social costs associated with certain business decisions or activities.
- Companies can use full-cost accounting to measure the “true cost” of their water use and discharges, in order to incorporate water factors into their overall business strategy and decision making.

Risk Assessment and Supply Chain Management

- Once a water footprint reveals the amount and location of water requirements, companies can begin to assess associated risks.
- WBCSD has designed an online water risk assessment tool which is useful in establishing a first cut at potential water resource risks in a business supply chain.
- Risk mapping is crucial in allowing companies to determine the “hotspots” where immediate intervention is necessary, as well as where issues may arise in the future.
- Understanding where these ‘hotspots’ exist or may emerge is essential to businesses strategic responses.

Stakeholder and community engagement

- Early and continuous involvement with communities and concerned stakeholders enables companies to better anticipate and respond to emerging issues and expectations.
- Open and ongoing discussions with local communities can be an important factor in preventing or reducing the risk of future water-related disputes or disruptions.
- Companies’ engagement activities are also including programmes to improve water quality or water availability within the watershed, such as direct participation in developing local water systems, the provision of funds or appropriate technology, education, or water resource planning, engaging with communities to install clean water technologies, supply access to water through wells and rainwater harvesting techniques.

Collective Action

- Effective management of water offers an occasion to collaborate and establish partnerships that diminish business risks and maximize social and economic returns. Peer-to-peer learning on water has increased through emerging industry sector-specific initiatives promoting best practice.

Water Stewardship

- *Management standards:* Standards for water use and performance have existed through numerous bodies (e.g., ISO GRI, BSI). For standards to be better prepared to address the complex issues that surround water there needs to be an exhaustive and detailed re-assessment.
- Water standards that were once sufficient for business operations may not prove robust in the face of uncertain water supply in extensive supply chains, or in geographic regions where water scarcity and conflict are becoming more pronounced.
- The Alliance for Water Stewardship (AWS) is one emerging initiative developing international standards that address the myriad of complexities relating to responsible water management.
- Neutrality and off-setting: Water neutrality and water off-sets have been explored in detail, as well as driving efficiency at field level as a way to reduce absolute water amounts.

Step 3: Beyond Footprint – Public policy engagement

- Most solutions to water supply, quality and sanitation issues require an adaptive co-management approach.
- It is only by intervening in the water policy and governance spheres that that water-related risk can be reduced to an acceptable level.
- There is a growing recognition by businesses that they can and should play a larger role in achieving water-related policy goals, as well as increasing expectations by society for Various drivers for corporate engagement in public policy.
- Regardless of external expectations, there are various reasons/scenarios why a company may want to engage the external environment beyond its direct operations or supply chain, including:
- Engagement in water public policy can take various forms, including advocacy/lobbying, self/voluntary regulation, partnership with government and local authorities, financial support to build water infrastructure and/or to advance policy objectives, etc.
- Businesses throughout the world are already engaging in the external environment for various reasons, illustrated by the following:
- Beverage companies engaging local water supply to neighbouring communities in the interests of ensuring social license to operate.
- Brewery jointly engaging future municipal water supply from nearby catchments in the interests of ensuring reliability and a shift away from deteriorating sources.
- Food processing company engaging local water associations linked to upstream farm suppliers in the interests of ensuring continued production under increasing regional growth and water stress.
- Extractive processing company engaging in the long-term water policy and strategy in a stressed catchment before deciding to invest.