

Managing our Future Water Needs for Agriculture, Industry, Human Health and the Environment



Discussion Document for the World Economic Forum Annual Meeting 2008

In collaboration with

CH2M HILL Companies Global Water Partnership International Water Management Institute (IWMI) IUCN Nestlé

PepsiCo

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The Coca-Cola Company
The Dow Chemical Company

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Executive Abstract

Significant business disruptions due to water scarcity – across all sectors and geographies, and with all the associated technical, economic, political, environmental and social implications – are a reality today, and are projected to worsen in the future, as a result of climate change and demographics. Governments play an important role in helping to mitigate and adapt to the challenge, but so does the private sector, through individual company actions and through innovative public-private and multistakeholder partnerships. CEOs are called to catalyse holistic water management actions up and down their respective supply chains and throughout the existing and new networks of which they are a part.

The focus of actions should include:

- Water governance for transparent/fair allocation to users and sound incentives for efficient water use;
- Water for agricultural use ("more crop per drop"; 70% of water withdrawn worldwide);
- Water for industry (water efficiency within operations);
- Water for energy (the deepening link between water resources and climate change);
- Water for human purposes (sustainable and affordable access to safe drinking water and sanitation);
- Water for the environment (to ensure sustained eco-system security).

To assist the development of this set of actions, the signatories of this paper encourage the Davos community to establish a wide coalition of businesses across different sectors. This coalition should create and collaborate with innovative partnerships on water management involving the research, development, farming, International Non-Governmental Organizations (INGO) and government communities. The World Economic Forum Annual Meeting can be used to help the coalition develop a plan of action that will:

- Help raise global awareness and make water a strategic management issue for both businesses and governments;
- Undertake a major international forecast on water security and its economic and political implications;
- Leverage the outstanding competencies of the global business community to help implement any actions;
- Support a substantive policy dialogue to improve water governance, to enable more market-based mechanisms and sustained global corporate citizenship on water.

At the Annual Meeting 2008, the public and private sessions related to water include:

Managing Our Future Water Needs (private) 24/01/2008 08.00*

Time Is Running Out for Water 24/01/2008 10.15

The True Value of Water 24/01/2008 12.30

Who Is Managing Your Supply of Water? 25/01/2008 09.00

Are We Being Bio-Foolish? 25/01/2008 20.00

Securing a Watertight Future 26/01/2008 09.00*

Death, Disease and Dirty Water 26/01/2008 14.00

*Please join sessions *Managing Our Future Water Needs* and Securing a *Watertight Future* where this specific call to action will be discussed and a process to craft an action plan for 2008 will be undertaken.



COMMITTED TO IMPROVING THE STATE OF THE WORLD

Managing Our Future Water Needs for Agriculture, Industry, Human Health and the Environment

What would you do if your business were severely disrupted due to a lack of water? This scenario is becoming quite real, whether due to absolute, economic or regulatory water scarcity. Our concern goes beyond a narrow business perspective: by the year 2025, the number of people living in water stressed regions will rise to 3 billion people. The impact of water stress will be acutely felt in our natural environment, could significantly impact global health, will severely challenge agriculture production, will limit industrial growth and, most importantly, will be a cause for human hardship at an extraordinary scale. Similar to the debate on climate change, business as usual is no longer an option. Unlike the debate on energy alternatives, there is no substitute for water.

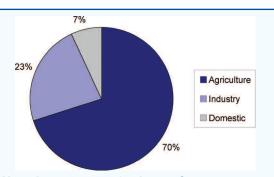
You are invited to read this short paper to consider why action is needed <u>now</u> to manage our future water needs, why this is a business as much as a political, social and environmental issue, and what can be done to avert crisis.

The World Economic Forum Annual Meeting in Davos convenes a series of water-related discussions. The aim is to leave Davos with the coalition, the framework and the commitments in place for a multi-partner, multi-industry global plan of action on water to take place during 2008 and the following years.

Companies, farmers, suppliers, governments and citizens should be more concerned by the impact of water stress.

Agriculture accounts for about 70% of water withdrawals worldwide, increasing to over 90% in developing countries; it is necessary for the production of our food, the natural fibres of our clothing, biofuels and other goods based on agricultural raw materials.

Industrial water withdrawals account for approximately 23% of global water consumption. Companies across all sectors use a significant amount of water to create wealth - benefiting the communities around them through their products and services. The water used often needs to be of high quality. In a range of industries - from beverages to chemicals to energy, from construction to metals - water is a key part of the manufacturing process. Water is used to cool and heat installations and as a key product ingredient; it is consumed, reused, processed, transformed and discharged. Increasing water stress presents a significant business risk to every company - especially those that take the uninterrupted delivery of water for granted in their supply chain. A survey found that 40% of Fortune 1,000 companies agree that the impact of a water shortage would be severe, but only 17% are prepared for such a crisis.



How do we use our freshwater?

Approximately 70% of developed freshwater withdrawn is used globally for agriculture.

How much water do we consume?

On average people in rich countries "eat" about 3,000 litres of water per day. They "drink" between two and five litres per day.

It takes:

- 800 to 4,000 litres to grow a kilogram of wheat
- 2,000 to 16,000 litres of water to "grow" a kilogram of beef
- 2,000 to 8,700 litres of water to grow a kilogram of cotton

As the world gets wealthier, it gets thirstier.

In Asia, wheat consumption tripled between 1961 and 2002; meat consumption grew by factor seven over the same period.

Globally, food demand is expected to grow by 70-90% by 2050; without water productivity increases. With no changes in diet, water for food requirements from rain-fed and irrigated lands could almost double. Water productivity gains in agriculture are critical therefore, if other growing demands for water are also to be met.

How much water do we use to keep us clean and healthy?

The World Health Organization suggests 20 litres per person per day is the minimum amount of water required to keep us clean and healthy.

1.1 billion people, nearly 20% of the global population, rely on open "free" sources for their water. Often even this limited supply is far away or of very poor quality. Without transport, energy or time, many in this group consume less than five litres per day.

Each toilet in rich countries flushes about 50 litres of water per day.

2.6 billion people, 40% of the global population, have no access to improved sanitation facilities.



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Water stress is global, but its impacts occur regionally and locally: there are few global markets where water stress will not present considerable challenges for businesses and for wider economic growth - as it already has in Australia, the western and southeastern United States and the Mediterranean region. Water stress is often most acutely felt at locations that are most crucial for future business growth. For example, there are increasing struggles with water pollution in China and across much of South-East Asia, and with water security in India, North Africa and the Middle East. Adapting to increased water scarcity will be a major challenge for sub-Saharan African economies. Furthermore, there are many economies in water stressed regions, for example some countries in the Middle East and in India, that effectively export their scarce water for free, embedded in goods such as wheat and rice. This further exacerbates water stress in the region.

The impacts of water scarcity affect a broad range of stakeholders in a wide variety of ways: commercial operations, employees' health and the health of their families and communities, the well-being of citizens, the profitability of local industries in the supply chain, the ability of local agriculture to deliver the crops needed by people and the economy, and the ability of the natural environment to function optimally.

Like greenhouse gas emissions, there can only be an increase in the level of interest from the public and from investors as to how companies are proactively managing their water risks moving forward. In reality, not only are companies affected by water risks, but communities are as well.

Over the years, many companies have taken steps to minimize their water consumption. Here are some of the common steps that companies take. The general techniques are well documented.

- Measurement of current water use effective water resource management can only occur when measurements are in place;
- Assessment of the water landscape and water risks;
- Establishment of internal water policies with goals and targets;
- Implementation and communication of best available water use efficiency and recycling technology;
- Prevention of the dangerous discharge of waste and pollutants into water systems;
- Factoring of the water risk into relevant business decisions – acquisitions, expansions, site selection and construction;
- Reporting water use performance using regular methods as a standard practice.

How much water do we use for goods and services?

Up to 300 litres for every car wash

About 2,700 litres of water to make one cotton T-shirt

About 1-2.5 litres of water to process one litre of gasoline

About 2,400 litres of water to produce one litre of maize-based ethanol in China; about 3,500 litres per litre in India because ethanol production is dependent on heavily irrigated sugar cane

How bad is the water stress forecast?

Now, over 1.2 billion people – 20% of the world's population – live in areas where the limits of sustainable water use have already been reached or breached. These include many of the world's breadbasket areas: the North China Plains, the Murray Darling River, the Colorado River and the Indus

The UNDP estimates that by 2025 the number of people in water stressed regions will rise to 3 billion people.

Is water stress really something for us all to worry about?

A report co-sponsored by the CGIAR, FAO, CBD and the Ramsar Convention which took five years and involved 700 scientists was released last year. It suggests that we will not have enough water to supply global demand for food over the next few decades unless reforms in water and agriculture are undertaken. A management and policy revolution, not a technical revolution, is required.

Failed wheat crops as a result of the severe drought in Australia have tightened global wheat supply to a 30-year low and resulted in surging world wheat prices to record levels.

In the United States, the Environmental Protection Agency predicted in October 2007 that the City of Atlanta's main source of water, Lake Lanier, would be drained dry within 90-120 days unless drastic reallocations were taken.

Over 1,000 people died during the summer of 2007 in India and over 12 million people were displaced as a result of flood-related incidents ravaging through vast parts of India.

In Los Angeles, only 3.21 inches of precipitation were recorded in the entire 2006-2007 rain season. It was the driest year on record.



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Better governance, best practice sharing, market instruments and broader alliances are needed to avert a crisis.

We all live and work within interconnected river basins and watersheds. No matter how good a company is at managing its own water footprint, this can be undone by another actor in the same river basin who manages water much less efficiently. All global business operations ultimately operate in close proximity with the water of local communities, local customers, local employees and local environments. Water is highly valuable to these different groups (not just economically, but also culturally, socially and environmentally). This means water is not like other business inputs.

Truly integrated approaches to managing joint future water needs are required. Some 20 years ago, water resource management was viewed through trends along the value chain, but structures are more complex today. Business and non-business actors operate in networks; in many instances companies can be both suppliers and customers, partners and competitors to each other – simultaneously. And in today's world of raw material shortage, the perception of the company at the end of an assumed value chain is no longer in command. By taking a network approach, a wider set of opportunities can emerge to manage water much more effectively, often with significant cost savings as a result.

This involves partnerships with many different stakeholders within a river basin – farmers, conservation organizations, small businesses, energy/power providers, suppliers of seed and irrigation equipment, raw materials and packaging suppliers, transportation networks, financial institutions and consumers. Multiple government agencies (both local and national) and water user associations have a key role to play, and civil society organizations, scientists, consumer groups and many other stakeholders become important partners for businesses to work with, in order to effectively and jointly manage collective water needs. This stakeholder network becomes even more complex - and even more critical when the discussion moves beyond those industries or products that intuitively use water and expands to the water which is so heavily "embedded" in many globally traded goods. The issue of embedded water highlights the important international and political dimensions of the water management challenge - the use of water from one watershed to produce a commodity, ingredient, or product - and then essentially transporting that "embedded" water around the globe, out of the watershed, and community, where it originated.

Water for the poor

There are many ways to ensure access for the poor to drinking water even in an environment where cost recovery for freshwater services is an accepted principle. In South Africa, each family receives 6,000 litres of water per month for free if they are unable to pay for it.

Water for power generation

The largest single use of water by industry is for cooling in thermal power generation.

A coal-fired power station requires 1.6 litres of water for each kWh, while a nuclear power station needs 2.3 litres/kWh. An average American household uses 10,000 kWh of electricity a year.

Water for the environment

Half of the world's wetlands have disappeared over the last century, with some rivers now no longer reaching the sea. Over 20% of the estimated 10,000 freshwater fish species are now endangered or extinct.

Lake Tai, the third largest freshwater body in China, succumbed this year to industrial and agricultural waste – an ecological disaster was created and over 2.3 million residents needed an alternative water supply.

Water and climate change

Climate change makes the situation worse. According to the latest IPCC report, if the global average temperature rises by 3°C hundreds of millions of people will be exposed to increased water stress.

Regionally the IPCC report suggests:

- By 2020, between 75 and 250 million people are projected to be exposed to increased water stress. Yields from rain-fed agriculture could be reduced by up to 50% in *Africa*.
- Freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease by the 2050s.
- Water security problems are projected to intensify in southern and eastern Australia by the 2030s.
- Changes in precipitation patterns and the disappearance of glaciers are projected to significantly affect water availability for human consumption, agriculture and energy generation in *Latin America*.





In addition, new technologies to cost effectively drive water reuse will be a critical enabler of industrial growth. A variety of technologies, system solutions and business models will be required. Solutions must be carefully matched to community needs and will require the cooperation of business, NGOs, financial institutions and governments. Aggregated community needs must be supported by country and geographic programmes that assure adequate long-term water supply.

What if nothing is done?

Possible futures include serious economic, social and environmental impacts. What if water remains inexpensive for heavy users? What if water prices double? What if water permits for agricultural or industrial uses are revoked or restricted in response to scarcity, conflict or civil society demands? What if water treatment costs rise dramatically, or people sicken as a consequence of severe water quality problems? What if water shortages lead to global shortages for some key food staples, for example cereals or juices? What if excessive water withdrawals create serious ecological risks? What if water tables dry up? Or lakes and reservoirs disappear? These are not at all unrealistic scenarios and are in fact occurring in many parts of the world.

There is increasing pressure from citizens around the world to act.

A survey conducted by GlobeScan in June 2007 showed that 88% of the general public across 24 countries are personally concerned about the environment. Most admit to holding companies *responsible* for improving the environment, with 69% of respondents expecting large companies to participate in positive and proactive approaches towards the environment.

There are no simple solutions – but there is time to avert the crisis.

Addressing the global water crisis is extremely difficult – it is an issue that has been – and continues to be – studied by many experts and there are no simple solutions. The traditional reliance on supply-led approaches is far from sufficient, but there is still time to avert the crisis by exploring innovative strategies and collectively making difficult trade-off decisions.

Using the regional meetings of the World Economic Forum over the past 15 months many business-led discussions have been held on water with stakeholders and experts around the world to explore potential mitigation strategies and the role the World Economic Forum's Industry Partners can play. From these discussions, we believe that:

- Awareness of the problem needs to be raised significantly among all stakeholders, also within the global business community;
- Water challenges are linked to the climate change issue, but it is not only about climate change. The main cause of water shortage is overuse, and water quality is also important;
- Water is local and global. While global initiatives are important to help fund and inform broadreaching investigations and policy, on-the-ground solutions have to be found at the regional and local levels;
- Multistakeholder groups and public-private partnerships that include governments, businesses and a wide range of other actors are required to find and implement these solutions;
- Some key river basins in the world, in developed as well as in developing countries, can provide good focal points for discussion and action;
- The problem is complex, there is no single fix, and sustainable solutions will take time;
- The challenge is not to reinvent the wheel, but to find ways to scale-up those practical initiatives that are providing sustainable solutions at local levels;
- Businesses will need to show leadership on the issue, finding ways to leverage their core competencies, and to help shift water more firmly into the political and economic domains;
- The productivity of water used for agriculture offers an entry point for relatively simple, but highimpact interventions;
- Most importantly, there is a need to start somewhere. Everyone agrees there is a big problem, which is still within our collective means to fix. Business as usual is no longer an option.

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Ideas for Action

Based on the discussions to date, we present three ideas for action. Your participation in the World Economic Forum Annual Meeting in Davos will help shape them further.

1. Raise global awareness - Undertake an economic and geopolitical forecast on water

While water and environment experts and communities have been aware of the extent of the water issue for many years, the message that water is a key strategic issue needs to be much more widely broadcast in the business and political domains, in order to motivate and catalyse action. Water needs to be put on the boardroom agenda and shifted more firmly into political and economic decision-making. Special, but not exclusive attention, should be given to water use in agriculture, particularly in a perspective of looking for the best cost-benefit relationship in our actions to conserve water.

Over the next 24 months, the proposition is to use the convening platform of the World Economic Forum to help Industry Partners engage in a major international forecast of water insecurity and its influence on future economic wealth and political security that builds on existing research with a group of expert partners, political and other social leaders.

Some key regional river basin "hotspots" where the water tension between agriculture, industry, health and environment is felt most strongly will be identified and focused on – locations where difficult water choices and trade-offs will have to be made very soon. In each case the forecast will examine the impact of various water management strategies, their potential trade-offs and consequent impacts on human health, environment, agriculture and industry:

- How do these strategies each play out with consumers and voters? Who will the winners and losers be?
- How might these potential river basin or watershed management strategies connect together to influence wider political and investment climates?
- What geopolitical and trade issues might link these hotspots to the global consumer? What global water issues might business and politics likely face as a result?

A series of high-level workshops will be held across the World Economic Forum's event calendar to develop these forecasts, as well as link them to other key dates in the wider water and development calendar.

2. Leverage business competencies - Sign the CEO Water Mandate as a first step

The business community is willing to take a leadership role in the process. To demonstrate this point, the CEO Water Mandate launched at this year's United Nations Global Leadership Forum is seen as a highly valuable first step for companies that wish to show leadership in water.

Many more companies, across all industry sectors, are urged to become signatories to the CEO Water Mandate. To join this wider water collaboration, the proposition is that it will be required for all participating companies to **sign the CEO Water Mandate**.

While the CEO Mandate coordinates the efforts of business and the exchange of best practices – and is a good start – **a wider multistakeholder coalition will be needed.** Once the economic and geopolitical forecasts on water are available and the level of awareness is higher, the Davos 2008 coalition could meet in a separate summit to develop further steps for leveraging business competencies, which are linked with and complementary to the CEO Water Mandate.

3. Support multistakeholder policy dialogues as part of Corporate Global Citizenship

Water is a commodity unlike any other – public institutions at all levels, i.e., local, national, regional and global – are its main guardians. To identify sustainable solutions to existing and emerging water problems, corporations in the Davos 2008 coalition, as part of their global citizenship responsibilities, will support a series of multistakeholder policy dialogues over the next 24 months with public institutions playing a central role. The dialogues will focus on water governance, on incentives for more efficient water use overall, on market-based instruments and on how water is being allocated (and re-allocated).





We aim to progress on these initial three actions – raising awareness, leveraging business competencies and supporting public policy dialogues – during 2008. We anticipate that well-designed, specific local or regional partnership initiatives will subsequently emerge or be scaled up. From our discussions to date, we believe that the area of water for agriculture offers a good initial focus, but there are other dimensions to explore as well.

A Call for Action

The UNDP 2006 Human Development Report highlighted the need for increased private sector involvement in addressing the global water crisis and called for a global action plan. Inspired by this, at the world Economic Forum Annual Meeting 2008 in Davos we seek to catalyse a wide coalition of businesses across different sectors to join and support innovative partnerships on water. We ask vou as leaders from business and leaders from the research, development, INGO and government communities to come together and help shape a concrete and detailed action plan. For the focus on water and agriculture, we particularly invite food, textile and other consumer goods companies to join, as well as chemical companies, companies active as suppliers of seed and irrigation equipment. and financial institutions active in financing irrigation and other water infrastructure. Academia is encouraged to play an active role, to ensure that the science used to inform the interventions is credible and sound. Most importantly, we wish to engage farming organizations as active partners. Other Industry Partners are welcomed to help develop the action plan's other important work areas. All who are willing and able to contribute to a solution are welcome. Please join us.

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