

Note: This paper presents a consultative draft open for comments. The paper will be finalized early 2016 as a contribution to the implementation of the SDGs. Please send your comments and inputs to Bernhard Frey at the UN Global Compact (freyb@un.org) and Stefanie Woodward at the Pacific Institute (swoodward@pacinst.org).

Briefing Note (Draft 24 November) Climate Change and Global Water Challenges: What Businesses Need to Know and Do

How climate change affects the water cycle...

Climate change has had widespread impacts on human and natural systems, especially the global water cycle.¹ In recent decades, its effects have been manifested as reductions in snowpack, increases in evaporation rates and water demands, sea level rise, and changes in precipitation patterns, with impacts on both water quantity and quality.² These impacts are expected to intensify as climate change worsens.

The Intergovernmental Panel on Climate Change (IPCC) concludes that “water and its availability and quality will be the main pressures on, and issues for, societies and the environment under climate change.”³ Managing water systems under changing conditions is, therefore, central to many strategies and activities aiming at anticipating and adapting to climate change.

Water-related impacts of climate change will vary regionally. While increases in precipitation will benefit some areas, according to the IPCC report, the benefits are “tempered by the negative effects of increased precipitation variability and seasonal runoff shifts on water supply, water quality and flood risks.” Overall, the report concludes, “the negative impacts of climate change on freshwater systems outweigh the benefits.”⁴

Specifically, climate change is affecting or will affect water supply, quality, and demand in a number of ways outlined below.

Climate change **exacerbates water scarcity and compromises a sustainable supply.**

- Changes in precipitation patterns and intensity will increase water shortages.⁵
- The volume of water stored and released naturally from ice and snow will decrease.
- Flooding, extreme weather, and sea level rise will affect the capacity and reliability of water supply infrastructure.
- Climate change will impair non-consumptive water uses, including freight transport, tourism, and fisheries on inland waterways.

Climate change **impacts water quality.**

- More frequent and severe extreme weather events will increase erosion and wash sediment, pollutants, and pathogens into waterways.
- Saltwater intrusion due to sea level rise will contaminate freshwater resources in coastal areas.

- Higher surface water temperatures will lead to more frequent and severe algal and bacterial blooms.

Climate change **increases water demand.**

- Higher temperatures will increase evaporation and soil moisture loss, which in turn will increase agricultural and ecosystem water demand. Globally, the average demand for irrigation is expected to increase between five and 20 per cent as a result of rising temperatures.⁶
- Higher temperatures will increase hydration needs for livestock.
- Higher temperatures will increase cooling water demand for industrial use.⁷

Climate change **exacerbates existing water-related challenges.**

- Hundreds of millions of people who live in floodplains or coastal areas will be exposed to flood risk or displaced by sea level rise, potentially creating a refugee crisis on a massive scale.
- Already over-allocated or polluted freshwater systems will become more stressed, increasing the challenge of providing adequate water and sanitation (WASH) services to those who lack access to improved drinking water and the 2.4 billion people who lack proper sanitation.⁸

Water and Climate: Key Facts

- The net effect of climate change is expected to be strongly negative.⁹
- In the context of climate change, 33 countries are likely to face extremely high water stress in 2040, including the US, China, India and 14 Middle Eastern countries.¹⁰
- Glaciers are shrinking worldwide due to climate change, affecting runoff and water resources downstream.¹¹
- Climate change will amplify existing water-related risks and create new risks for natural and human systems. These risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.¹²
- While attribution of a single extreme weather event to climate change is challenging, it is likely that climate change will cause an increase in the frequency and intensity of extreme weather events, including floods, droughts, and precipitation events.¹³

Water and energy are strongly interconnected

Another important aspect of the water-climate change linkage is the strong connection of both to energy. Water plays a critical role in energy generation. It is used for extracting, refining, processing, and transporting all forms of energy, from coal to solar. Large volumes of water are used to cool conventional thermal generating plants and recent extreme temperature events have led to cutbacks in power generation.¹⁴ Energy production can cause significant water pollution. On the other hand, vast amounts of energy are also used to treat, distribute, and use water.

The risks of managing water, energy, and climate issues separately should not be underappreciated, particularly by policymakers. Indeed, water and energy policies often compete with one another, and decision-makers often value energy production over water protection. Further, many activities to manage and reduce GHG emissions require large amounts of water, often increasing water risks. Similarly, some measures to manage water stress require significant amounts of energy.

While these links present challenges, they also provide opportunities. More efficient use of water, e.g., in agricultural or industrial production, will often reduce the energy needed for this production and therefore decrease related GHG emissions. In fact, saving water can often provide substantial energy

savings at a lower cost than traditional energy efficiency programs. For example, an analysis by the California Energy Commission found that water efficiency programs could provide 95 per cent of the energy savings of traditional energy efficiency programs at 55 per cent of the cost.¹⁵ Additionally, water conservation and efficiency reduce vulnerability to climate change by reducing pressure on limited supplies and can therefore be an important adaptation strategy.

... and increases risks to business

We have seen that climate change will exacerbate water scarcity, affect water quality, and increase water demand. This can pose enormous risks to business:

- Reductions or disruptions in water supply can affect water-intensive manufacturing operations, raw material supply, intermediate supply chain, and product use. **Water scarcity** can also affect power generation, limiting the availability of hydropower or affecting power plants that run steam turbines or water-based cooling systems.
- Many industrial processes demand high-quality source water. **Polluted source water** can affect human and ecosystem health and it can cause product quality issues, increase operational costs, or necessitate capital expenditures for pre-treatment.
- In addition to the financial impacts of the risks described above, water scarcity is also increasing the overall **cost of water** and water services.
- Water scarcity and declines in water quality will put pressure on local authorities and policymakers to impose additional **regulations** such as caps on usage, stricter water quality standards, and water reallocation. Regulations may also cause water-intensive products and services to be phased out or water withdrawal permits to be suspended.
- Products and services that require large amounts of water or energy to produce or to use, or that pollute water and ecosystems, also pose the risks of **reputational damage** to companies and social or political **conflicts with communities** and citizens. This is especially true in cases where declines in water quality or availability increase competition for water. Reputational damage and conflicts are more likely to occur when the perception exists that business water use impedes universal access to water and sanitation in communities where these human rights are not granted;¹⁶ or when business water use negatively impacts ecosystems of cultural, recreational, or economic value to citizens. These risks can ultimately lead to the shutdown of business operations or to the loss of customers who opt for less water-intensive products.

What businesses can do to manage water-climate risks strategically

Companies are increasingly aware of and better understand the risks of climate change to their operations. They also increasingly recognize that their ability to operate depends on the well-being of the communities in their value chain. The water and climate risks facing communities are inherently business risks, as companies rely on communities as suppliers, customers, employees, and for access to local resources and services. Companies that recognize these strong linkages and respond by supporting local adaptation can better manage risks and also gain comparative advantage. Therefore, there is a clear business case for taking climate adaptation action that helps strengthen the resilience of business operations and the communities where they operate.¹⁷ In its reports on responsible corporate adaptation,¹⁸ Caring for Climate presents a framework for managing water-related climate risks and opportunities while at the same time strengthening community resilience. This paper expands upon Caring for Climate's framework below, outlining activities and strategies that companies can use to mitigate water-related climate risks.

Instituting new practices within their operations to manage climate risks and impacts

- Companies should seek to integrate their water and climate risk assessments into operations and long-term planning. They should anticipate and plan for a wide range of climate change scenarios and related **physical, regulatory, and reputational water risks**.
- Climate-related impacts on water should also be considered when making a range of business decisions from developing water management plans, to factory design and siting, to new product development.
- Companies should also consider potential energy/water synergy (or conflict) in business planning and decision-making. For instance, integrated approaches to reduce water and energy use simultaneously have allowed companies at a single plant to achieve reduce costs while increasing output. In addition, such efficiency measures can demonstrate a company's commitment to sustainable water management, boost public image, and help build positive relations with the communities where it operates.
- Companies should integrate water and climate issues into strategic planning, operational activities, supply chain management, and new product development. This can include considering new business models, substituting closed-loop or less water-intensive materials or components, and investing in water efficiency or waterless innovations.
- Companies can support disaster risk-reduction strategies for at-risk populations in their operations and supply chains through risk assessment, capacity building, and structural and non-structural hazard mitigation.

Engaging with governments, communities, and other stakeholders to put in place policies and ground-level practices that contribute to long-term resilience

- Corporate actions and investments (including through their suppliers) that improve resilience and adaptation to unavoidable climatic changes, can bring many benefits. Companies realize the greatest benefits from this approach when they invest strategically in adaptation at the nexus of company needs and community needs to support sustainable development.¹⁹
- Most solutions to water stress require collaborative activities involving sound water governance and partnerships to address shared water and climate challenges. For example, a company might work with local stakeholders to help implement national water policy or leverage corporate resources to help assess water risks or invest in building the capacity of local water managers. By pooling resources and bringing together a wide range of expertise and knowledge for a common goal, companies can respond to water and climate concerns more efficiently and effectively than through individual actions. Collaborative actions are particularly helpful in assessing and addressing climate change impacts, since there are large gaps in knowledge and data on these issues.
- Companies should engage stakeholders as a part of water and climate risk assessment, long-term planning, and implementation activities. Through early and continuous engagement with concerned stakeholders, companies can better understand, anticipate, and respond to emerging issues and expectations, reducing the risk of future water- and climate change-related disputes or disruptions.
- Companies should publicly **disclose and communicate water and carbon performance and risks**, also thereby engaging employees, and helping stakeholders assess how companies address material sustainability and issues.²⁰
- Respecting and supporting the **human rights to water and sanitation (HRWS)** helps address climate risks by supporting communities and ecosystems, improving standing with communities, developing new markets, and strengthening the company's license to operate.²¹

- Companies can develop products and services that help communities adapt to water impacts of climate change, particularly the development of products and services that promote resilience, such as data and technology offerings, and rainwater catchment and water treatment systems by accessing new public financing streams earmarked for climate change adaptation.²²
- To build adaptive capacity and resilience in their supply chains, companies can support research on climate impacts and disseminate information and tools to help members of their supply chain — particularly small-scale producers — manage risk. They can facilitate access to information, equipment, and technology that helps them withstand climate shocks. If companies create shared value²³ by sourcing from small and medium-sized enterprises, thus creating local jobs, the community will have a stronger overall economic base and be more resilient to crises.²⁴

The UN Global Compact’s initiatives on climate and water

Launched by the UN Secretary-General Ban Ki-moon in 2007, [Caring for Climate](#) is the UN Global Compact, UNEP and UN Framework Convention on Climate Change (UNFCCC) secretariat’s initiative aimed at advancing the role of business on climate change. Chief executive officers who support the Caring for Climate Leadership Statement are prepared to set goals, develop and expand strategies and practices, and to publicly disclose emissions. Caring for Climate is endorsed by about 400 companies from 60 countries.

Also launched by the UN Secretary-General in 2007, the [CEO Water Mandate](#) is a UN Global Compact initiative providing a multi-stakeholder platform for the development, implementation, and disclosure of corporate water stewardship policies and practices.

The UN Global Compact is a call to companies everywhere to voluntarily align their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption, and to take action in support of UN goals and issues. The UN Global Compact is a leadership platform for the development, implementation and disclosure of responsible corporate policies and practices. Launched in 2000, it is the largest corporate sustainability initiative in the world, with over 8,000 companies and 4,000 non-business signatories based in 160 countries.

Climate and water as integral parts of the Sustainable Development Goals and a tremendous opportunity for business

UN climate change goals and actions are mainly articulated through UNFCCC. UN-Water is the United Nations inter-agency coordination mechanism for all freshwater related issues, including sanitation.

The UN Agenda 2030 for Sustainable Development, through its Sustainable Development Goals (SDG), covers a wide range of topics related to climate change and water. The SDGs complement and mutually reinforce the work of the UNFCCC and UN-Water. SDG 6 “Ensuring availability and sustainable management of water and sanitation for all” and SDG 13 “Taking urgent action to combat climate change and its impact” specifically focus on these two issues (see all goals [here](#)).¹

The SDGs represent an unprecedented opportunity for companies to align their own climate- and water-related goals with broader policy goals for long-term sustainability. The private sector can make an important contribution to mitigate and adapt to the water-related impacts of climate change and reach the SDG targets. At the same time, the successful implementation of the SDGs will strengthen the enabling environment for companies around the world.

¹ Learn more about the SDGs here: <https://sustainabledevelopment.un.org/topics>.

Make a commitment to water and climate action!

The UN invites all companies to demonstrate leadership in advancing climate and water related goals by making collaborative or individual commitments. [Learn how to make a commitment through the online platform business.un.org](#). Companies can also utilize the [Water Action Hub](#) to find peer companies and other prospective collaborators interested in improving climate resilience in regions of shared strategic interest.

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² http://ar5-syr.ipcc.ch/topic_observedchanges.php

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⁵ David Chandler, "Water supplies could be strongly affected by climate change: Changes in rainfall can be amplified, up or down, in changes to aquifers," Massachusetts Institute of Technology News, December 18, 2008. See: <http://web.mit.edu/newsoffice/2008/agu-groundwater-1218.htm>

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⁷ IPCC 2007 Report, Technical Summary, 2007.

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¹⁴ U.S. Global Change Research Program. National Climate Assessment, 2014. <http://nca2014.globalchange.gov/>

¹⁵ California Energy Commission (2005), California's Water-Energy Relationship, Sacramento, <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>

¹⁶ CEO Water Mandate. Guidance for Companies on Respecting the Human Rights to Water and Sanitation: Bringing a Human Rights Lens to Corporate Water Stewardship, 2015. <http://ceowatermandate.org/files/business-hrws-guidance.pdf>

¹⁷ Caring for Climate. Adapting for a Green Economy: Companies, communities, and climate change. UN Global Compact, UN Environment Programme, Oxfam, World Resources Institute, 2012. Web.

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