



CHOKES POINT: SOUTH AFRICA

Revealing the immediate challenges and emerging solutions in the increasing competition between water, food, and energy in a changing climate

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PROPOSAL

***Choke Point: South Africa* adds essential details to global knowledge about the ties between water, energy, and food in the era of swift economic and ecological transition.**

SUMMARY

Choke Point: South Africa

In South Africa, lingering 20th century practices in water use, and energy and agricultural production are colliding with 21st century ecological and economic realities: the warming and drying climate, rapid population growth, powerful fossil fuel interests, endemic poverty, and systemic water scarcity.

As in much of the rest of the world, fossil fuel prices, grain reserves, and water supplies are more erratic than ever in South Africa. Drought, flooding, storms, and disease outbreaks batter the country and are putting millions of people in harm's way, and threaten to upend decades of human and environmental progress.

Project Summary

In *Choke Point: South Africa*, Circle of Blue will explore and reveal how Africa's second largest economy is faring two decades after it adopted one of the most ecologically aware constitutions on the planet.

In 1996, South Africa's new constitution assured every citizen "a right of access to basic water supply and basic sanitation," and that "water services institutions must take reasonable measures to realize these rights." Among the select group of nations that assert the right to fresh water, South Africa's constitutional provision for access is seen as the benchmark model.

In *Choke Point: South Africa*, Circle of Blue will assess a significant nation's 21st century commitment to assuring citizens and businesses access to a scarce resource amid a welter of conflicting climate, demographic, social, and industrial trends. South Africa is another timely, imperative opportunity to apply Circle of Blue's influential global narrative about the causes of ecological tumult, and the select group of places around the world that are developing capable responses.

Coverage Topics

Just as we have done on five other continents we have visited, the intent of *Choke Point: South Africa* is to understand the risks and the formidable opportunities that lie ahead for a critical country of ample coastal beauty, desert ecology, and scarce water.

Among the topics Circle of Blue will investigate are:

- The effects on water use and clean energy development from Eskom's more than \$US 30 billion construction of two new, large-scale coal-fired power plants.
- A report on how the plants were financed and the continental and global implications of how finance institutions decide which energy, water, and farm projects are appropriate for big investments in an era of competing resource needs.
- The deliberations and consequences of decisions under consideration at senior levels of government on whether to pursue shale oil and gas development or clean energy generation.
- The effects of a deep drought on South Africa's farm sector, and its economy.
- The work underway in Capetown to make the city more resilient to climate-related disruptions in its water supply.

Choke Point: South Africa adds essential details to global knowledge about the ties between water, energy, and food in the era of swift economic and ecological transition.

The results will provide globally significant findings about the effectiveness and consequences of institutional decisions about how to respond to new conditions.

Project Outline

Based on methodology developed by Circle of Blue and recognized by the Rockefeller Foundation Centennial Innovation Award, *Choke Point: South Africa* uses unique tools and processes to collect and house large amounts of data and narratives that will be published, shared and convened around to catalyze public participation. *Global Choke Point* is built on three components that create intersecting, cumulative results:

1. Data management, visualization, and sharing: Data engineering expertise, analysis, and modeling applications, including the powerful platforms of Google Fusion Tables and QlikSense will help gather, store, visualize, and share key data. This also contributes to Circle of Blue's 2015 Clinton Global Initiative commitment with Qlik, NASA, Twitter, Columbia University and the Pacific Institute to quickly advance understanding of the world's fast-emerging groundwater crises.
2. Front-line reporting: Trusted, on-the-ground reporting and inquiry created by teams of leading journalists, photographers, and field researchers who report from the front lines of the world's resource crises will provide timely, urgent context of decision-grade value to mainstream, niche, and local media, as well as to key groups and stakeholders at the core of the problems and to those working on the solutions.
3. Engagement: Targeted outreach, social media communities, and high-level convening around localized, rich, contextualized knowledge that will help policymakers, the public, experts, NGOs, and businesses understand and respond to the fast-emerging and interconnected water-food-energy challenges of the 21st century. Convening and scholarship partners include the Woodrow Wilson International Center for Scholars.

Expected Outcomes

The world's demand for fresh water is growing so fast that scarcity is disrupting energy production, triggering food shortages, upending economic development, and threatening political stability. The consequences are felt now, from California to Asia and the Middle East, where drought and floods trigger serious disruptions and political unrest.

To respond, Circle of Blue, the leading organization in journalism, data, research and convening, has created *Global Choke Point*, the world's first nimble indicator and on-the-ground reporting about global resource challenges at the intersection of water, food, and energy in the era of climate change. The Woodrow Wilson International Center for Scholars has been an instrumental impact partner.

Global Choke Point helps leaders in business, policy, and development make faster, fact-based, strategic decisions with fresh, on-the-ground intelligence and analysis. The project combines award-winning journalism and imagery with unprecedented collections of new and historically relevant data. By illustrating the nexus of water with food, energy, and climate, it informs more systemic, timely, reasoned responses.

Global Choke Point — along with *Choke Point: South Africa* — reveal complicated, systemic issues that affect every nation's economy, environment, and security.

By most any standard, the world is making ill-informed decisions, quickly. *Choke Point: South Africa* illustrates real-world, "live" situations, and tests assumptions within the added context of tenacious, trusted front-line reporting.

The world needs:

- New, trusted, compelling narratives that challenge and inspire, make issues personal and relevant to wide audiences, and trigger transformational impact.
- Connected data sets — real-time and historic, local and national — that are shared, open, visual, participatory, and that inform mission-critical decisions.
- A driven team of data experts and on-the-ground reporters who are passionate about finding and testing

new ways to understand and accelerate responses to the severity and intense impact of the collision between water, food, and energy.

- Fact-based conversations that nurture new innovations, technologies, policies, investments, methods of participation, and levels of transparency and accountability. the severity and intense impact of the collision between water, food, and energy.

An Urgent Global Narrative

In its simplest construct, the global confrontation between water, energy, and food is easy to summarize. Population growth and western-style, energy-consuming patterns of development are generating entrepreneurial opportunity, luring rural residents to cities, and producing steep increases in demand for fuel and grain. Yet, as growth bounds upward in the sectors that consume the most water — energy and agriculture — rain and snowmelt in urban centers, and prime energy and grain producing regions are dropping, causing sharp declines in available freshwater reserves.

In 2009, Circle of Blue began its award-winning *Choke Point* series.

Choke Point: U.S. was the first comprehensive analysis of the consequences of converging trend lines for energy production and water consumption in the United States. The report galvanized attention to the close ties between energy and water, prompted an inter-agency task force in the Obama administration, and informed new research programs at the World Bank, Greenpeace, the World Resources Institute, the Union of Concerned Scientists, and the World Economic Forum.

In the six years since, Circle of Blue has undertaken similar, exclusive *Choke Point* projects in India, Mongolia, Panama, Qatar, Peru, Mexico, and in three iconic farm regions in the United States.

This work has shown the colliding trend vectors on supply and demand for water, energy, and food that are reshaping the Earth's environment, reordering national priorities, and influencing national economies and global security.

Case Study: *Choke Point: China*

Circle of Blue's *Choke Point* projects have resulted in profound outcomes, especially in China.

Circle of Blue used its in-depth reporting skills and data analysis to reveal for the first time for the Chinese government, and stakeholders globally, the game-changing fact that China does not have enough water to continue mining and processing coal at escalating consumption rates. This has serious implications for the farmers of Nan Liang, the shepherds at the edge of desertification near the coal mines of Xilinhot, Inner Mongolia, and the increasingly water-stressed urban populations of Chongqing and Beijing. It is also likely the single greatest impediment to the country's continued economic growth.

Through its exclusive reporting in partnership with the Wilson Center China Environment Forum, three speaking tours in China, and more than 20 convenings in the United States and China — including the Chinese Water Ministry, U.S. Embassy, Yellow River Commission, World Economic Forum in Davos, Capitol Hill, and even the Nan Liang farm along the Yellow River— Circle of Blue made an imminent scenario come alive, and helped leaders, businesses, analysts and the people most affected begin to understand the relevancy and complex relationships.

Impact

The Ministry of Water Resources was moved by Circle of Blue's findings and research capacity to deliver fact-based and compelling stories in a context mixed with trusted, new data. This grim national scenario compelled the Water Ministry to recommend the results to the Ministry of Environmental Protection (MEP). Circle of Blue collaborated with MEP and the Asian Development Bank on a first-of-its-kind study in two of China's fastest

growing, water-challenged cities. Among its findings: new ways to assure economic development, raise living standards, particularly the indigenous communities on China's borders, and conserve water and energy while reducing emissions of hazardous air pollutants, including climate-changing gases.

On November 12, 2014 the President of the United States reached a momentous accord with the President of China to cap greenhouse gas. Two of the pact's six major provisions are meant to secure freshwater supplies in energy production — the "water-energy nexus" that Circle of Blue has reported on globally since 2010. The U.S. State Department confirmed that Circle of Blue's reporting informed these two points.

Since the accord, both nations are now investing in research to improve efficiency and conservation in water supply for energy generation and developing a carbon-sequestration demonstration project in China to put produced water from deep beneath the surface and displaced by CO2 storage to good use.

Circle of Blue brought its findings to civic, academic, government, and NGO audiences in both countries, including speaking tours in China in 2011, 2012, and 2013.

Cost

Circle of Blue seeks funding partners to support this one-year, \$350,000 globally significant and timely project beginning January 2016.

WATER CRISES ARE THE WORLD'S #1 GREATEST RISK OF HIGHEST IMPACT.

— WORLD ECONOMIC FORUM

From the Persian Gulf to the Great Lakes, fresh water scarcity is disrupting people, business, markets, the environment and political stability at every level. Insufficient information and expertise make it even more difficult for governments, businesses and the public to assess and manage water resources now and into the future.

Governments, companies and NGOs increasingly consider the competition between water, food and energy as not just an environmental challenge, but a serious risk to global stability, economic sustainability, human health, reputation, supply chains, customers and cultures.

Acute issues at global scale require trusted information and local context to generate awareness, inform policy and build markets.

By every indication, time is limited and response requires knowledge, nimble innovation and tenacity.

Mission

Founded in 2000, Circle of Blue uses world-leading talent to create the relevant, strategic and actionable frontline intelligence about the planet's resource crises that leads to informed and accelerated responses. Circle of Blue's core focus is on the fast-emerging confrontation between water, food and energy.

Proven Process

Circle of Blue unites classic journalism, data innovation, and transformative convening, and brings connective knowledge and collaboration to problems that are complex and urgent. Its groundbreaking work around the world — including the Great Lakes, U.S., China, Australia, Mexico, India and the Middle East — is shaping policy and decision-making from the grassroots and boardrooms to Davos.

For its unique processes, Circle of Blue received the Rockefeller Foundation Centennial Innovation Award.

“Circle of Blue is an integral part of the global network of innovators that is restructuring and re-organizing social systems to yield better solutions and create stronger, more resilient societies.”

— Dr. Judith Rodin, President, Rockefeller Foundation

Peering into the Future

Circle of Blue is designing the world's first "global resources situation room" to provide in-depth, decision-level data and context as a global crisis gains further foothold. The live content, scenarios and planning will help the world respond to the resource nexus that challenges business, economies, geopolitical stability, equity, and the environment. In 2015, Circle of Blue, Qlik, NASA/JPL/UC-Irvine, Twitter, Columbia University, and the Pacific Institute launched a 3-year Clinton Global Initiative commitment to reveal the broad linkages and precarious state of the world's groundwater supplies.

Risks & Development

Investments tied to water, food, and energy are exposed to huge uncertainties in policy, legislation, commodity pricing, social values, and local and global trends. In the case of acute issues at global scale, raising unprecedented national and global fact-based awareness is critical for informing policy changes, and for creating the environments for innovation that lead to efficient, accelerated solutions.

"Our planet's future relies on the ability to spot weak signals of emerging trends and understand them in the context of global political risk. Fresh, on-the-ground intelligence is crucial to that understanding. No one is better positioned to deliver ground-breaking knowledge on the critical resource of global water than Circle of Blue."

—Ian Bremmer, President, Eurasia Group

Impact

- Early warning system that informs markets, research journals, media, consultancies, risk analyses, ministerial meetings, and scenario sessions around the world. From the media to C-Suites, Joint Chiefs and the World Economic Forum.
- Recognized new operating system driven by innovation, passion and nimble response as tenacious as the challenges.
- Award-winning collaborations with best-in-field talent and organizations.

"To respond to the world's greatest, most urgent challenges, we need trusted information, clear context, and solutions-focused dialogue. Circle of Blue cuts through the complexities of global development. Through knowledge and informed action, we can make a better future."

— Henrik Skovby, Executive Chairman, Dalberg Global Development

Strategic Supporting Partners

Circle of Blue, a non-profit, non-advocacy organization and affiliate of the Pacific Institute, has received support from the Ford Foundation, Packard Foundation, Rockefeller Foundation, Skoll Global Threats Fund, Hewlett Foundation, Energy Foundation, MolsonCoors Company, Coca-Cola Company, World Economic Forum, Alpern Foundation, Ball Foundation, and others.

Partnerships, Collaborators

World Economic Forum, Wilson Center, Skoll World Forum, Qlik, Twitter, Skoll Foundation, GlobeScan, Qlik, The Value Web, Google Research, Northwestern University, Tsingua University, Ningxia University, Lawrence Berkeley National Laboratories, Burson-Marsteller, and many more.

Learn more

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Global Agenda Council on Water Security
World Economic Forum

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CHOKE POINT

ON THE GLOBAL FRONT LINES OF THE WATER-FOOD-ENERGY CRISIS

The water-food-energy choke point is forcing a new 21st-century reckoning.

Three colliding trends—declining freshwater reserves, uncertain grain supplies, and booming energy demand—are disrupting economies, governments, and environments around the world. Unlike food or energy, we cannot grow or easily produce more water. That is especially true in the era of climate change, when more severe droughts and floods tighten the food and energy choke points already caused by waste, pollution, and mismanagement of water.

Complex challenges demand integrated analyses and innovative solutions. Research teams from the Woodrow Wilson Center and Circle of Blue are reporting from China, Australia, the United States, India, and the other frontlines of the world's water-food-energy crisis. For instance, we were the first to report that China's coal sector consumes nearly 20 percent of the country's scarce water resources.

U.S. Energy's Water Footprint: A dramatic shift is occurring in energy production as deeper droughts and fiercer storms lash the nation. One of the most critical economic and environmental questions the U.S. must answer is how to develop new supplies of energy, like shale gas, and grain across a landscape where moisture is limited and confrontations over water are increasing.

China's Thirsty Coal: Coal's water footprint, which saps China's freshwater reserves and displaces agriculture, is likely to grow as coal consumption increases by 30 percent by 2020. Dwindling water supplies are the primary impediment to China's soaring coal production, forming a choke point that threatens to upend the country's impressive economic progress.

Outsourcing Water-Intensive Industries: The confrontation over water, food, and energy produces choke points that ripple around the globe. In Australia, foreign investments in coal and liquefied natural gas are disrupting irrigation in farming communities. Water scarcity has forced Saudi Arabia to shut down its wheat farms and invest in temperate lands in Africa.



50%

of the world's population lives in cities

20%

increase in city dwellers by 2030, expanding global urban population to 4.9 billion

70%

of energy produced globally is used by cities

28%

of water used globally goes to cities

Water uses energy. Energy uses wa CITIES NEED AL



Megacities lose more than 50% of their water due to mismanagement and poor infrastructure.



Saudi Arabia's desalination plants used 1.5 million barrels of oil every day in 2010—or one-sixth of its output—to quench the thirst of its inland cities.



Electricity accounts for 80% of the cost of processing and distributing municipal water in the United States.




Agriculture is the most water-intensive sector, constituting 70% of freshwater withdrawals globally and up to 90% in developing countries.




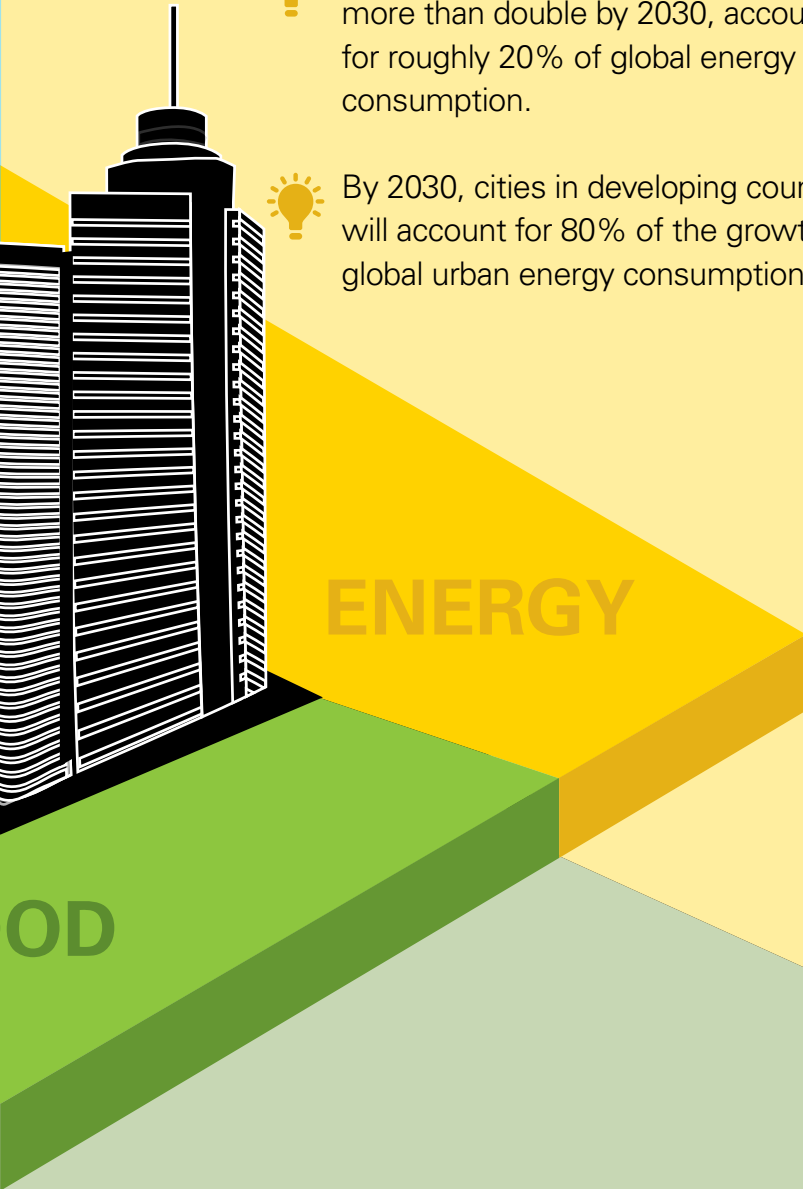
Each year, 30% to 50% of global food production is wasted. The water footprint of this waste is 550 billion cubic meters, roughly equal to what China withdraws in a year.

The water-food-energy nexus

ter. Agriculture needs both. LTHREE.

 Energy demand in China's cities will more than double by 2030, accounting for roughly 20% of global energy consumption.

 By 2030, cities in developing countries will account for 80% of the growth in global urban energy consumption.



Beef production requires 13 times more water than wheat. By 2050, global meat consumption is likely to double, due in large part to rising affluence in cities.

is a city's foundation.

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Delhi, India: Water and the electricity to pump and move it are heavily subsidized for industry and agriculture in India, but the urban poor wait hours for a trickle of salty, smelly water to fill their buckets.



New South Wales, Australia: A coal loader eats away at a mountain of black coal. In 2011, the coal mines, trains, and loading terminals here shipped about 114 million metric tons of coal.



Chengdu, China: Water-intensive coal-to-chemical plants supply China's huge fertilizer demand. Organic farms, such as this one near Chengdu, help reduce the country's severe agricultural runoff problem.

ABOUT US

The Wilson Center and Circle of Blue combine in-depth environmental research expertise, unparalleled networks, and first-rate multimedia reporting skills to generate strategic insights into the complex water-food-energy choke points.

The Wilson Center's Jennifer Turner has established the China Environment Forum as one of the most reliable sources for information on China's environment. She has testified before the U.S. Congress, led trainings for Chinese officials, and assisted international and Chinese NGOs and researchers in developing projects.

In 2012, Circle of Blue's founder, J. Carl Ganter, won the Rockefeller Foundation's Centennial Innovation Award in recognition of his innovative work on the water-food-energy crisis. He also serves as vice chairman of the World Economic Forum Global Agenda Council on Water Security.

In its first two years, Choke Point has informed policy, shifted business practices, catalyzed new governmental research, and convened thought leaders and the global media around the water-food-energy nexus. *Choke Point: China* is significantly influencing the work of Greenpeace China, China's Ministry of Environmental Protection, and the World Economic Forum, among others.

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India's common practice of pump-and-flood irrigation is draining aquifers and increasing electricity usage.

UPCOMING GLOBAL CHOKE POINT INITIATIVES

- **The China Water-Energy Team** will map the policy, technical, and governance steps China must take to meet its pressing water-energy needs.
- **Choke Point: India** investigates the water-food-energy nexus where resource mismanagement threatens stability, from Himalayan glaciers to Rajasthan's deserts to Mumbai's slums.
- **Choke Point: Cities** examines the recklessly expanding water and energy footprints of growing urban areas around the world and identifies innovative solutions.
- **Choke Point: Index** captures and analyzes "big data" across sectors, spots early trends, and informs further Global Choke Point projects, in partnership with Lawrence Berkeley National Laboratory's Institute for Globally Transformative Technologies, using the latest open source tools and scientific modeling.
- **Choke Point: Conflict Zones** will tap aid agencies, journalists, and others working in conflict zones to better understand the relationships between resource scarcity, geopolitical conflict, and peacemaking.