The Role of the Private Sector in Addressing Resource Scarcity Risk

By Emily Taylor and Stephen Ahn
Executive Summary

This paper, the first of its series, reflects key discussion themes among roundtable participants and outside presenters. Here we highlight the key challenges of impending resource scarcity faced by businesses and potential approaches to craft effective solutions. We argue that the optimal solution will be co-created through public and private sector collaboration.

Resource scarcity poses a significant threat to companies with supply chains and products dependent on limited resources. The world is facing an unprecedented period of impending scarcity that will dramatically change the way business is done and governments manage natural resources. Drawing parallels to the Grand Strategy that carried the U.S. through the challenges of World War II, the public and private sectors must develop a unified coalition to bring all efforts to bear in order to develop a solution to address resource scarcity and preserve economic prosperity. The public sector cannot solve these challenges on its own. Similarly, the market will not adaptively respond to the environmental risk that will plague business growth in the future. A supportive regulatory environment can establish the institutions and conditions necessary for the private sector to deploy their market-based strategies.

About the Authors

Emily Taylor (’14) and Stephen Ahn (’15) participated in a fellowship coordinated through the Erb Institute and the World Environment Center (WEC), sponsored by IBM. WEC’s Innovations for Environmental Sustainability Council brings together senior leadership from leading private sector companies, government agencies, non-governmental organizations, and universities. These thought leaders discuss the role of business in developing solutions to global sustainability challenges and exchange strategic concepts, data analyses, and best practices. Emily and Stephen were instrumental in developing the content and facilitating dialogue at the May 2013 roundtable on Resource Scarcity in Arlington, VA.

Emily Taylor (’14) is interested in how the public and private sectors can work together to accomplish our development and climate change goals. Emily interned with the World Resources Institute in Summer 2012, exploring how to use public financing to mobilize private investment in low-carbon projects in developing countries. She spent Summer 2013 with McKinsey & Company in management consulting.

Stephen Ahn (’15) interned at Philips Healthcare in India, working on a go-to-market strategy for a new product. Stephen served in the Peace Corps Honduras for two years as a business adviser and prior to that he worked five years in asset management. Stephen received a B.S in business admin from Boston College.
The Problem

One risk area that many businesses currently do not consider or account for is how resource scarcity may impact future operations. The current economic growth model assumes that the availability of resources will stay constant. If businesses face a constraint on one resource, the market can adjust through increased prices and a possible creation of a substitute. However, the global economy and financial sector are facing a systemic risk—one in which many resources are becoming more expensive, and increasing environmental pressures are creating additional costs. According to a paper published by the Institute and Faculty of Actuaries in the UK - Resource Constraints: Sharing a Finite World, at best, resource constraints will increase fuel and commodity prices in the future, but at worst, it can trigger a long-term decline in the global economy and civil unrest.

Past experiences with resource scarcity highlight the nonmarket implications and impacts for private sector players.

Below are several examples:

- **Food Scarcity:** With the 2008 spike in food prices, 61 countries experienced political unrest and more than thirty imposed food export bans or restrictions. The increased price of grains caused many milk producers in China to put toxic additives and water into the milk and stretch their supply, resulting in a large scandal. In the summer of 2010, severe droughts in Russia and the subsequent decision by the Russian government to ban exports of the crop caused the price of wheat to rise 40% in subsequent months. In Mozambique, a 30% rise in bread prices triggered riots that left seven dead and 288 wounded.

- **Raw Materials:** Between 1977 and 1979, cobalt prices increased 380% following a rebellion in Zaire, which at the time was a supplier of 45% of the world’s cobalt. The global supply chains were squeezed until firms and governments found viable substitutes.

- **Energy:** It is widely believed that the 1973 oil crisis started the decline of American cars. High gas prices increased the demand for fuel-efficient cars, which Japanese car manufacturers provided. American car companies attempted to build smaller cars, but the Japanese cars proved to be more reliable.

- **Water:** Several years ago, Coca-Cola faced a major backlash after threatening its license to operate in India. The company’s bottling plants in Rajasthan were aggressively contributing to the troubling water scarcity, severely affecting the ability for nearby communities to access sufficient water supplies. Pressure from the public and institutions like our own
Strategies to Address Resource Scarcity

In May 2013, several companies across various industries – AECOM, Boeing, Coca-Cola, General Motors, IBM, Ingersoll Rand, Roche, and Walt Disney – convened in Arlington, VA for the World Environment Center’s (WEC) Innovations for Environmental Sustainability Council roundtable. The topic for the meeting was resource scarcity and its effect on businesses. The event was sponsored by IBM and moderated by Dr. Terry F. Yosie, the President and CEO of the WEC, with our assistance as WEC/Erb fellows.

The agenda included facilitated dialogue among participants and presentations from outside experts working at the intersection of resource scarcity and either security, economic strategy, or markets. The experts provided unique perspectives on how to approach and address issues of resource scarcity in both the private and public sectors.

The first to present was Richard Engel, a director of the Environment and Natural Resources Program at the National Intelligence Council (NIC) and a retired U.S Air Force Major General. The NIC supports the Director of National Intelligence and develops Intelligence Community (IC) products for policy communities.

• General Engel summarized the new findings of the new Global Trends 2030 report, a forecast into the world trends that will affect the United States by the year 2030: The global middle class is expected to grow, especially in Asia. The middle class in the European Union and the United States is expected to shrink (proportionately to the world). China will grow slower than India due to China’s one child policy.

The Problem continued

University of Michigan to shut down the facility spurred the company to identify itself as the source of the solution to reduce water consumption to allow for reliable access to the nearby farming communities.

• Land: The amount of arable land available globally has fallen from 0.39 hectares per capita in 1960 to 0.21 hectares in 2007, increasing risk of “land grabs.” In 2009, South Korean company Daewoo signed a deal in Madagascar to lease half of the country’s arable land for 100 years with no payment to the government. It is believed that discontent with this deal led to a coup, resulting in the new government canceling the deal.
• From a geopolitical perspective, China and India are expected to see a considerable increase in their national power. They will make relative gains on the United States, and by one method of measuring national power, China will have more national power than the United States just past 2030. The traditional four components of national power are: gross domestic product (GDP), population size, military spending, and technology.

• The impact of automation on global labor is not fully understood. Some analysts predict an increase in the use of robotics and displacement of human labor, and they observe this displacement will occur at a rate faster than displaced workers can be retrained. This may result in chronic under- or un-employment.

• The broad deployment of information technology, youth unemployment, and poor urban social and physical infrastructure will all increase the risk of social disruptions out to 2030.

• Some effects from climate change are occurring faster than expected, especially the reduction of the arctic ice cap. There are also early indications that storms are more violent today than they have been historically due to increased energy in the atmosphere. Finally, it appears the upper atmosphere jet stream is changing with a more meandering direction of flow – large north/south components instead of the more traditional west to east flow. This has resulted in unusual weather patterns, as some areas experience higher or lower temperatures for a longer period of time. These weather patterns will affect the agriculture sector more than the service or manufacturing industries, although the United States will not be as adversely impacted due to application of agriculture technology. However, not all climate scientists are yet in agreement that this change in the jet stream is related to climate change.

• Climate scientists predict increased water stress in agricultural production areas in China, India and the United States, as well as other parts of the world.

• Shale gas and light tight oil are likely to shape the near term energy environment for North America. By all predictions, Asia will increase its use of coal – one of the worst contributors of greenhouse gasses. By some predictions, U.S. coal use will drop, and the U.S. coal producers will seek overseas markets.

Patrick Doherty, deputy director of the National Security Studies Program and director of the Smart Strategy Initiative at the New America Foundation (NAF) introduced an approach based on learning from past experiences. The NAF is a nonprofit, nonpartisan public policy institute and think tank focusing on a wide range of issues, including national security studies, technology, asset building, health, energy, education, and the economy.

Mr. Doherty spoke about America’s Grand Strategy, the alignment of America’s economic engine, governing institutions, and foreign policy to solve the global challenges of the era. During World War II, the strategy was to out-produce the Axis countries. The Cold War strategy was to avoid superpower confrontation (containment) and to outperform and outlast the Soviets. The new challenge we are facing is widespread unsustainability of the international system, which will require the United States (and the world) to adopt a new “Grand Strategy” to tackle this new threat.

Specifically, the four key issues facing the world are:

• **Economic Inclusion:** Urbanization and the growing demand for resources. More people are moving from rural areas to the cities. This increases the access and demand for goods and products.

• **Ecological Depletion:** Potential for political disruption. According to a United Nations Environment Program report (From
Conflict to Peace-building - The Role of Natural Resources and the Environment, 2009), there have been at least eighteen violent conflicts fuelled by the exploitation of natural resources since 1990.

- **Contained Depression:** The economy must reduce debt-to-income ratios, eliminate excess capacity, and bring the prices of assets back into line with their earning power; these tasks are made more difficult by paltry income growth, volatile but overall weak production, and periods of depressed earnings. This may lead to a downward spiral: layoffs depressing demand, leading companies to layoff more workers to maintain profits, furthering depression of demand. Our current model is not sustainable. The government, through the Federal Reserve policy, the TARP bailout, and the stimulus bill, has been propping us up to keep our economy from collapsing.

- **Resilience Deficit:** Disruptions may have a significant impact on supply chains for lean operations and just-in-time inventory management.

According to Doherty, these issues need to be addressed systematically and not looked at individually. The question for the government is, “How can we create the conditions to address these issues successfully?” With globalization, nothing can be accomplished without international agreement. There should be an opportunity for the United States to lead the global transition to sustainability through a new Grand Strategy.

The final presenter was Jason Clay, the senior vice president of Market Transformation at the World Wildlife Fund (WWF), an international NGO working on issues regarding the conservation, research, and restoration of the environment. Mr. Clay discussed how we are currently living beyond the planetary capacity – 1.5 times the amount of available resources, which is equivalent of living off the principal and not the interest. To sustain these levels, either consumption needs to be reduced by 60% per person, or production needs to be increased (in a sustainable manner). Productivity will need to double, scarcity will need to be managed, and resources will need to be managed strategically – we won’t be able to focus on everything at once, so the question of prioritization must be answered.

Mr. Clay further stated that China and India are doubling their GDP at a rate faster than the United States and the United Kingdom; China lifted 400 million people out of poverty. There is a 10-12 year lag between when GDP grows at that rate and how that growth rate affects the commodities market. Additionally, China is the preferred buyer of commodities (no terms and cash payment); it buys half of Brazil’s iron for steel production. To process this iron, there is an increased need for timber products.
(wood) to create charcoal, leading to deforestation.

In agriculture, the largest exporters of cereals and oilseeds are concentrated to a handful of countries, half of which faced drought issues. This has huge implications; food-importing countries have political stability issues due to a lack of food. Currently food is cheap, but more than one billion people cannot afford it, and half of farm families cannot feed themselves.

In summary, the National Intelligence Council reports that the United States faces changing global concerns such as a shifts in consumption (growing middle class outside North America and Europe), resource scarcity, and climate change. The New America Foundation states that the United States government has no grand strategy and believes that it should address the unsustainability of the international system. The WWF, due to a lack of faith in the government, is focusing on the private sector to implement change.

**Where is the Solution?**

Possible solutions to managing for resource scarcity fall into three possibilities: government-led, private sector-led, or a joint effort between both sectors. We are confident an ideal direction going forward can be identified among these three options.

**Government-led solution:** A government led solution would be increased regulation. This would be the least favorable approach for businesses, as government regulation would likely take the form of command and control of natural resources. The semi-recent experiences with cap and trade illustrate the challenges with creating a strong enough political coalition around market-based government approaches.

**Private sector-led solution:** The first businesses in an industry to tackle resource scarcity will likely lay the groundwork for competitive advantage once those resources fall into perceptible decline, and we have seen businesses identify resource scarcity as a significant business risk. Internally managing for resources (e.g. Disney and its internal carbon tax) or developing a product and service mix that helps consumers use fewer resources and save money through big data (e.g. Ingersoll Rand’s Nexia thermostat) are two examples of how to incorporate natural resource scarcity and climate change trends into a business model to provide resilience under future scenarios.

The majority of the roundtable discussion focused on potential solutions from the private sector domain:

1. Create new sources of resource abundance. There is an immense amount of technological innovation and discovery that, especially through leveraging insights from big data, could be used to provide creative solutions to efficiency and resource-use challenges.

2. Build new markets at scale through advanced analytics of big data to create new consumer coalitions based on purchasing behavior, preferences, and demographics.
3. Realign time scale to reflect reality: In addition to striving for short-term disruptions, organizations should also consider lengthening planning horizons, recognizing that incremental actions can also be transformative in addressing resource scarcities.

These potential solutions are exciting and could very well materialize by building off of current private sector initiatives to create meaningful impact. However, we argue that perhaps an optimal solution would be to blend private sector-led efforts to coordinate with the public sector to maximize impact.

Joint, public-private sector-led solution: As Doherty reminded us, America’s Grand Strategy carried us through World War II. This unified strategy took cooperation and collaboration between the public and private sector to bring all efforts to bear in order to achieve the country’s goals. The public sector cannot solve the challenges before us on its own. Similarly, the market will not adaptively respond to the environmental risk that will plague business prosperity in the future. A supportive regulatory environment can establish the institutions and conditions necessary for the private sector to deploy their market-based strategies. We must draw lessons from the past to similarly solve the present challenges that threaten our future.

To accomplish this Grand Strategy, the government, with active private sector engagement, must establish sustainability-focused policy goals for industry and businesses to follow. This strategy must leverage the government as a convener and regulator of the public good together with the power of the private sector to create efficient markets. For example, in housing development, funding for transportation and housing subsidies should be geared to promote walkable communities rather than population dispersion into suburbs. This would reduce reliance on personal automobiles, encourage public transportation use, and lower infrastructure development and distribution costs. In food production, rather than subsidizing industrialized agriculture production as it is practiced today, the government should look at ways to encourage all farmers to practice regenerative agriculture production to halt soil degradation. The government should also build regional food systems that keep more money circulating in local economies and increase support for local farmers. Similar innovative solutions should be co-created in partnership toward a common goal and aligned to a common strategy.
Finding Opportunity

We are facing impending scarcity at the food, water, and energy nexus. Future growth will largely depend on a company’s ability to assess and respond to these risks. However, working in partnership with the public sector to craft a new Grand Strategy will put our society on a more certain trajectory towards prosperity. Governments and businesses around the world are demonstrating commitments to improving the management of natural resources and promoting a green economy of the future. As we seek collaborative innovation, let us ensure we learn from successes and failures of the past in both the public and private sectors to co-create the new rules of the game and our inclusive playbook.

References

2ibid.
7ibid.