



Rockefeller
Brothers Fund

Philanthropy for an Interdependent World

Climate Change and Global Security Stephen Heintz, President, Rockefeller Brothers Fund

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Introduction

I am genuinely delighted to be with all of you today to discuss a topic I care very deeply about. I believe that climate change is the defining global challenge of *our* time, and for times long to come.

As Rory indicated in her introduction, the RBF is a foundation that seeks to contribute to a “more just, sustainable, and peaceful world.” At present we see climate change as the single largest obstacle to that ambitious vision. We currently make grants in excess of \$10 million per year for work related to climate change in the United States, China, and at the global level. We are engaged in efforts to build public understanding of climate science, shape public policy, encourage the development and deployment of green technologies, and support the successful negotiation of a global climate compact.

Some find it ironic that a foundation endowed with wealth generated in the oil business is now focused on efforts to sharply curtail the use of fossil fuels. I simply embrace the irony—and I’m pleased to report that the Rockefeller family vigorously supports our efforts.

Now, because OTR is an organization concerned with global affairs and foreign policy, I will focus my remarks today on the global security implications of climate change.

Part I: Pakistan

To get us started, I want you to imagine that you are one of the 3.3 million people living in the Federally Administered Tribal Areas of Northwest Pakistan, known as “FATA.” Like your neighbors, you are a farmer. You till the same plot of land that has been in your family for generations. Your grandfather and father used to grow an array of crops, from fruits and vegetables to wheat and maize. You did too, in the earlier years. The farming life wasn’t easy for your forbearers. Like the majority of FATA residents, they never rose above the poverty line. But life was tenable. And for most of your life, a tenable—if tenuous—existence was also available to you. Able to provide for your family, you counted yourself among the lucky ones.

But for the last decade, your yields have consistently declined year over year. Armed militants, the Tehriki-i-Taliban, have systematically sabotaged regional irrigation projects and controlled the

movement of crops and people into and from the area, rendering trade nearly impossible. Still you make do, turning to cereal grains—hardier but less valuable—to stay solvent.

Extreme politics are one challenge. Extreme weather is another. Floods come every year during monsoon season with an increasing fury and a seemingly endless capacity for physical destruction. In 2010, FATA suffered the worst flooding it had seen in 80 years, leaving over one-fifth of Pakistan's landmass underwater. Your fields were submerged, your village washed away. Like millions of others, you were forced to flee.

When the waters finally receded, you returned to find that your entire crop and supplies of animal fodder had been destroyed. Your farm was unrecognizable under a foot of cracked mud. Packing up what few belongings the floodwaters had spared, you joined the tide of tens of thousands of displaced people seeking shelter and food. The Pakistani government, you soon realized, was woefully underprepared and too overwhelmed to deal effectively with the crisis. International agencies could muster only so much aid, and their refugee camps were overflowing. With no other options, you eventually turned to extremist organizations like Lashkar-ee-Taiba, whose humanitarian efforts were notably more effective. They offered you food, shelter, and eventually, employment.

Pakistan is considered one of the countries most vulnerable to climate stress, being exposed to a catalogue of weather disasters from cyclones, tornados, monsoons, and floods, to heat waves and drought.

Pakistan's people are hungry. The 2011 National Nutrition Survey found that 58 percent of the population was food insecure following the monsoon floods.

Pakistan's people are increasingly rootless. According to a U.N. estimate,¹ there are nearly one million displaced people in northwest Pakistan as a result of the combination of ongoing armed conflict and recurrent weather related disasters.²

Pakistan's people have little faith in their government, whose failure to provide timely, coordinated, and adequate humanitarian relief has weakened its authority.

Islamist groups have taken advantage of these conditions to establish grassroots charities that also serve as recruitment centers. Michael Breen, a former U.S. Army captain who served in Afghanistan, estimates that the Taliban recruited as many as 50,000 fighters after the 2010 floods in Pakistan.³

As you know, the stability of Pakistan is on everyone's shortlist of critical global security concerns. Pakistan is the sixth most populous country in the world. And its population is expected to double by 2045. It has the eighth largest armed forces and a nuclear arsenal that is estimated at between 90–120 weapons. It shares borders and complex relations with Afghanistan, India, China, and Iran.

¹ Office for the Coordination of Humanitarian Affairs (UNOCHA)

² Pakistan: Humanitarian Snapshot (16 November – 15 December 2013), UNOCHA

³ "Climate Change Our Most Serious Security Threat" *The San Francisco Chronicle*, Michael Breen, August 23, 2013.

Pakistan and India have fought three major wars in the last 65 years and ongoing cross-border disputes have the potential to provoke a regional security crisis with global implications.

And as if there weren't challenges enough, security estimates and current military operations now must anticipate and respond to the impacts of more frequent and more severe incidents of extreme weather. These are the security dimensions of climate change.

Part II: Climate change is a threat multiplier

Pakistan, unfortunately, is not unique. A study undertaken with RBF support by a distinguished panel of retired U.S. generals and admirals⁴ concludes that climate change acts as “a threat multiplier for instability in some of the most volatile regions of the world.” On the simplest level, as the report states, climate change has the potential “to create sustained natural and humanitarian disasters on a scale far beyond those we see today. The consequences will likely foster political instability where societal demands exceed the capacity of governments to cope.”

But unlike most *conventional* security threats that involve a single entity acting in specific ways and points in time, climate change has the potential to result in multiple chronic conditions, occurring globally and creating vast, simultaneous, complex emergencies. As a result, we can expect that economic and environmental conditions in already fragile areas will further erode as food production declines, the incidence of disease increases, clean water becomes increasingly scarce, and large populations begin to move in search of resources.

The international community and the United States are likely to be drawn more frequently into these crises. We will be called on to help manage humanitarian disasters. We will be looked to for assistance in resolving active conflicts and restoring political stability.

The military experts' report predicts that even stable regions of the world like the U.S. and Europe “may experience mounting pressure to accept large numbers of immigrant and refugee populations as drought increases and food production declines in Latin America and Africa.”

And we won't have to wait hundreds of years to see these effects. By the end of this century, a projected three-foot rise in sea level will flood almost one-fifth of Bangladesh leaving 15 million people in search of higher ground.⁵ The refugee crisis that will ensue is not hard to imagine. Neither is the refugees' likely destination—which is partially why neighboring India is building a 26-foot high, double walled fence running the length of the border with Bangladesh.⁶

As climate change increases the likelihood and frequency of extreme weather, scientists predict that the number of global climate refugees will rise to 50 million in less than 40 years. That's the equivalent of the entire population of South Korea, without a home. Some estimates predict that the number of refugees could grow as high as 200 million by the end of this century.

⁴ “National Security and the Threat of Climate Change,” Center for Naval Analysis (CAN), 2007.

⁵ “Vital Water Graphics: An Overview of the State of the World's Fresh and Marine Waters,” 2nd edition, 2008.

⁶ “Climate Change Our Most Serious Security Threat,” Michael Breen, *The San Francisco Chronicle*, August 23, 2013.

Not all of these refugees will present global security threats, of course, but such an enormous number of displaced people will certainly strain relief systems, add significant stress to already weak governments, and foster a political environment in which the forces of safety, stability, and democracy are undermined.

These predictions are not just theoretical. Both the genocide in Darfur and the collapse of the Somali state were preceded by multi-decade droughts that displaced desperate populations and helped upset the fragile political equilibrium in both regions. The long-term security threats that stem from these areas continue to have global implications, and these are just a few examples of security challenges that are exacerbated by climate change.

We live in a time of global interdependence that has brought significant economic gains to hundreds of millions around the world. But this interconnectedness also means that the effects of extreme weather can be felt far beyond the areas of direct impact. In 2010, for example, unusually high temperatures and reduced rainfall so significantly decreased grain production in Russia that fears of domestic food insecurity led the Russian government to ban wheat exports. This resulted in a spike in global wheat prices that had an acute effect in regions dependent on wheat imports, including northern Africa where bread shortages fueled unrest in Egypt, Tunisia, and Algeria.

The International Water Resource Management Institute projects that in the next 10 years, Pakistan, South Africa, and large parts of India and China will be designated as “water scarce.” And to give you an idea of what this means, imagine daily life with 80 percent less water than you currently use. A number of countries in the Middle East and northern Africa already face serious water shortages, and as droughts worsen, we are likely to see more widespread conflicts over scarce water resources.

But the challenges will not *only* occur in the developing world—as we know, climate change is increasing the frequency and severity of extreme weather here at home. Last month, the federal government declared parts of 11 states disaster areas because of long-term drought. In 2012, fires burned more than nine million acres across the United States and caused approximately \$1 billion in damage. Superstorm Sandy, which many of us here directly experienced, left 286 people dead and caused approximately \$68 billion of damage as it blew through the Caribbean and up the U.S. coast.

Much of the damage was due to a massive storm surge and temporary sea level rise that offers a foretaste of what is likely to become permanent as a warming planet accelerates ice melt at the two poles causing sea levels to rise by as much as 6 feet by the end of this century.⁷ Under these conditions, 7 percent of New York City, 62 percent of Atlantic City, and 88 percent of New Orleans would be submerged.

It seems hard to imagine that these climate-related conditions are likely to cause direct threats to the security of the United States but to the extent that they weaken our economy or require massive outlays from already strained government budgets, the impacts of climate change may erode our ability to protect U.S. national interests across the globe.

⁷ Climate Nexus

I participated in the annual Munich Security Conference at the beginning of the month and climate change featured prominently on the agenda for the first time. German Foreign Minister Frank-Walter Steinmeier told the assembled heads of state, foreign and defense ministers, and security experts that “climate policy is forward-looking security policy” and he noted that the map of global conflicts quite closely resembles the map of climate-related weather disasters. Until now, climate change has not been considered in the mainstream of foreign and security policy. I believe that is changing.

Part III: Climate science

I have been making the case that climate change exacerbates global security challenges. But as Nicholas Kristof has recently reported, more Americans believe there is evidence that aliens have visited earth than believe that humans are causing climate change.⁸ This is stunning considering the overwhelming evidence that the planet is warming at an alarming rate and the scientific consensus that this is the result of human activity.

Based on reviews of published scientific research, more than 97 percent of climate scientists agree that climate change is real and that humans are largely responsible. In September, the Intergovernmental Panel on Climate Change issued a revised assessment, raising its level of confidence in findings that humans are causing global warming to 95 percent.

Since the late 19th century, Earth’s global average temperature has risen by about 1.4° Fahrenheit. This may not seem like a lot until you consider that an increase of only 8° brought the planet out of the last Ice Age 12,000 years ago. And, whereas *that* warming occurred over several millennia, today’s atmosphere has warmed 1.4° in less than 150 years. And the rate of warming will continue to accelerate as levels of greenhouse gases in the atmosphere continue to rise.

This 1.4° average change is already being felt by millions of men and women, from farmers in FATA, to coastal dwellers in the Rockaways, the Hamptons, and the Philippines, to thirsty and hungry children in the Horn of Africa. Ice sheets are melting. Sea level is rising. The patterns of rainfall and drought are changing. Heat waves are getting hotter and lasting longer. Extreme precipitation is growing more extreme and more frequent. The oceans are acidifying and jungles are disappearing. On every continent and in every ocean, animals and plants are migrating toward cooler temperatures.

You may have seen an article in *The New York Times* over the weekend reporting that a new study indicates that of the 19 cities that have hosted the winter Olympics, as few as 10 might be cold enough to host them again in midcentury. The number is likely to drop to six by 2100.⁹

The main source of global warming is carbon dioxide, or CO₂, a pollutant produced by the burning of fossil fuels like coal, oil, and natural gas. Atmospheric levels of CO₂ *today* exceed those observed for at least 650,000 years. Once CO₂ is released into the atmosphere, much of it remains locked in

⁸ “Neglected Topic’ Winner: Climate Change,” *The New York Times*, January 19, 2014.

⁹ “The End of Snow?” Porter Fox, *The New York Times*, February 7, 2014.

place for a century. Twenty percent remains in the atmosphere for millennia. This means that even as we make progress in reducing carbon emissions, we can expect that global temperatures will continue to rise. If we were to continue emitting CO₂ at current rates, global temperatures could rise as much as 7–10° Fahrenheit by the end of this century with consequences that would be nothing short of disastrous for the planet and human civilization.¹⁰

Part IV: Reasons for hope

Bold action to dramatically reduce carbon emissions and to build resilience in threatened regions and communities is essential if we are to avoid the most drastic outcomes. As a forthcoming report from the American Association for the Advancement of Science states, “the sooner we act, the more options we’ll have and the better off we’ll be in limiting the human and economic costs”¹¹ of climate change.

Given the dire projections I have shared with you this afternoon, you may be surprised to hear me say that I see three reasons for hope. First, the rapid development and deployment of clean energy technologies; second, significant progress by the world’s two largest climate polluters, the United States and China; and third, encouraging prospects that global leaders will reach a meaningful climate compact when they gather in Paris at the end of 2015.

The rapid growth in clean energy and energy efficiency is quite impressive. In particular, the use of renewable energy, especially wind and solar, is proving to be a viable alternative to coal.

In the United States, wind power development reached a new record in 2012 with \$25 billion invested and 13,000 megawatts added to the grid. We are also seeing significant advances in the development of solar power. Installed solar systems more than doubled in the United States in 2012¹² and they are estimated to have grown by the largest margin ever last year.¹³

The pace of renewables development across the globe is also encouraging. China is now not only the largest manufacturer and exporter of solar and wind equipment, it is installing these technologies at home much faster than anyone else.¹⁴ India, which has been lagging behind, is now moving aggressively as well. Six Indian state companies have embarked on a \$4.2-billion project to build the world’s largest solar plant in the Rajasthan desert.¹⁵

Germany’s renewable energy law has become a model for governments around the world. More than 100 countries, including 20 European states, China, India, Turkey, and Saudi Arabia, have enacted some version of what the German’s call a “feed-in tariff.” This mechanism guarantees a long-term

¹⁰ Climate Nexus

¹¹ AAAS, “What We Know: The Reality, Risks, and Response to Climate Change,” 2014 (forthcoming)

¹² To 7,000 megawatts.

¹³ To nearly 11,000 megawatts.

¹⁴ Last year, China built 10,000 megawatts of new solar and 12,000 megawatts are expected to come on line in 2014, much larger amounts than industry insiders anticipated even a year ago. China also plans to increase its wind power production from 75 gigawatts today to 200 gigawatts by 2020.¹⁴

¹⁵ “US Rebukes India on Solar power,” *Financial Times*, February 11, 2014.

price for renewable energy production and an automatic connection to the electricity grid. With these two things in hand, project developers are able to secure bank loans to finance equipment purchases. Germany's experience has proven that a rapid shift to renewables is feasible and can be economically beneficial.

One surprising example of the global renewables upsurge is happening in Saudi Arabia. The nation most synonymous with oil has decided to build 54,000 megawatts of new renewable energy generation for domestic energy consumption. The Saudis are losing significant potential revenue by using subsidized oil for domestic electricity. They'd much prefer selling that oil internationally at prevailing market prices of \$100 per barrel or more. As a result, the Saudi leadership has concluded it's in their national interest to install solar and wind at a large scale to power their electricity grid.

Looking worldwide, the International Energy Agency reports that power generation from renewables will exceed that from natural gas and be twice the energy generated by nuclear power plants by 2016. The agency reports that renewable energy is the fastest growing sector of the global power market. By 2018, it will account for 25 percent of all energy generation. A great deal more investment is needed, but the trends are encouraging.

Along with wind and solar energy systems, new technologies in building construction and vehicles are producing significant gains in energy efficiency and here too, trends look very promising.

Data published by the U.S. Energy Information Agency, shows reductions in energy use in U.S. buildings every year since 2005. Globally, buildings represent approximately one-third of total energy consumption, so improvements in this area have significant impact.

And a remarkable, long awaited technological evolution is also powering energy saving opportunities in the vehicle sector. Here at home, rules enacted during President Obama's first term mean that average fleet fuel efficiency in cars will increase from under 30 miles per gallon to nearly 55 miles per gallon by 2025. This will reduce average energy use in passenger vehicles nearly by half, saving consumers billions in fuel costs and significantly reducing emissions. Sales of electric vehicles doubled in 2013 with eight automakers now offering electric cars in the U.S. market. Total numbers remain small, but efforts by states on both the east and west coasts to connect highway systems where drivers are assured of finding charging stations are in the forefront of supporting the shift to electric vehicles.

China is also likely to be the fastest adopter of electric vehicles and it has clearly signaled that it is accelerating new and existing building efficiency measures as well. China has retrofitted hundreds of millions of square feet of residential and commercial buildings over the last five years alone. The government has also set ambitious goals for future green building construction.¹⁶

My second reason for optimism is the new leadership we are seeing from the world's two largest climate polluters—the United States and China, which together emit 40 percent of all greenhouse

¹⁶ "Update on China's Buildings and Appliances Program," Dr. Kevin Mo, Energy Foundation of China, August 7, 2013.

gases. In the last several years, both countries have implemented aggressive emission-reduction policies that have the potential to steer the entire global community in a better direction.

In the United States, emissions have fallen every year since 2008 and are now 12 percent below 2005 levels. The single biggest drop in U.S. emissions has come from the decline in coal-fired electricity generation, which has dropped from 50 percent of our nation's electricity production to 38 percent in the last four years. By 2020, experts predict that coal will fuel only a quarter of U.S. electricity generation. Some of this is due to the availability of cheap natural gas but the increase in the use of renewable energy and the gains in energy efficiency are contributing significantly. But more needs to be done if the United States is to meet the emission reduction targets that are required of us as part of the global response to climate change.

Last June, after years of stalled efforts in Congress to adopt aggressive climate policies, President Obama announced a major new executive branch initiative on climate change. In China, after years of resisting emission-reduction policies, the government has announced it seeks to cut the carbon intensity of the Chinese economy—that is, the amount of CO₂ produced per dollar of economic output—by 40 percent by 2020, compared to 2005 levels.

Air pollution from coal-fired power plants has become a serious political liability for the Chinese government, as coal plant emissions contribute to respiratory illnesses that afflict millions of Chinese and cause more than a million deaths each year. As a result, Chinese leaders are actively seeking ways to clean the air. Reducing the use of coal is the key, given that China depends on coal for nearly 75 percent of its energy needs.¹⁷

With aggressive new government policies in place or on track and the rapid development of clean energy technologies and gains in energy efficiency, a Citibank report predicts that coal emissions in China are likely to peak before the end of this decade—10 years sooner than previously projected. Given the new sense of urgency among Chinese leaders at all levels and a new openness to global cooperation on emission reductions, many are hoping there can be even faster progress in China.

The third reason for my optimism is that there is growing momentum toward a global compact to significantly reduce carbon emissions. Internal progress in both the United States and China is also enabling closer cooperation *between* our two countries on climate and energy issues, despite other difficult challenges in our bilateral relations. Sino-American cooperation has the potential to reinvigorate negotiations on a new global climate agreement.

At the Copenhagen Climate Conference in 2009, one of the major impediments to success was the very public and highly contentious disagreement between the United States and China on how best to reduce emissions. Since then, there have been intensive efforts to increase cooperation between the two biggest emitters. President Obama and Secretary of State John Kerry have made this a priority and are making real progress with their Chinese counterparts. A good example is the progress President Obama and President Xi Jinping have made in negotiations toward a bilateral agreement

¹⁷ “China on world’s ‘biggest push’ for wind power,” BBC, January 7, 2014.

to prevent use of hydrofluorocarbons, a greenhouse gas that is 1,000 times more potent than carbon dioxide. The two leaders are encouraging India to sign up as well.

I am pleased to say that the RBF has supported a U.S.-China Track II dialogue on climate change since 2007. This has offered Chinese and American climate experts and policymakers an informal venue for frank discussion of the issues.

World leaders are finally beginning to act in unison. When President Obama called for a virtual end to U.S. financial support for World Bank-financed coal-fired power plants, a coalition of other nations, including the Nordic countries and the United Kingdom also signed on. The European Investment Bank, the European Bank for Reconstruction and Development, and the U.S. Export-Import Bank have indicated that they too, intend to join the effort to end coal finance.

Building on all these developments, U.N. Secretary General Ban Ki-Moon has announced that he will host a summit of heads of state in New York on September 23 of this year in an effort to accelerate momentum for achieving a meaningful global climate agreement in Paris in December 2015. The RBF is working with the Secretary General's staff to help plan this initiative.

Conclusion

Despite the growing signs that leaders and citizens are finally facing the climate challenge, the threats remain profound. This is an environmental issue of unprecedented scale. But it is also an economic and social issue. And, as I hope my comments have demonstrated, it is a global security issue.

But fundamentally, climate change is a moral issue as the poorest global citizens are also the most vulnerable to climate catastrophe and the vitality of nature itself is at risk.

The global community is mobilizing to meet this challenge and I am genuinely hopeful we will take the bold measures that are needed to dramatically reduce greenhouse gas emissions and help vulnerable populations and regions adapt to the realities of sea level rise and the increasing frequency and severity of extreme weather.

The human spirit and human ingenuity have surmounted numerous existential challenges over the course of history. In the last two centuries alone, improvements in sanitation, nutrition, medical science, and economic activity have lifted hundreds of millions out of extreme poverty and significantly extended life expectancy. The computer in your iPhone is 240,000 times more powerful than the one that has guided the Voyager satellite from its launch in 1977 to the edge of the solar system today.¹⁸ We have solved complex environmental challenges, including threats from the ozone hole and acid rain. Humankind's capacity for progress is nothing short of remarkable.

Human activity has caused climate change but changes in human activity can save the planet from catastrophe.

¹⁸ "In a Breathtaking First, NASA's Voyager 1 Exits the Solar System," *The New York Times*, September 12, 2013.