



FEATURE

Climate Change Adaptation: Lessons from Unlikely Sources

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INTRODUCTION

Imagine a scenario in which you're trying to save for retirement. You would have to commit to putting away money now in order to yield a benefit that won't be realized for quite a few decades. Or you can spend the money on a new car now—a purchase that isn't totally necessary but would be a nice upgrade. The thought of driving the vehicle all over town provides near-instant gratification. The thought of putting that money into a retirement savings account becomes less appealing by the minute.

The same principle applies to climate change. Many of the solutions required to adapt to future climatic changes—the benefits of which won't become fully apparent until later this century—require modification to business as usual. Resisting the urge to spend money in the near term can take serious willpower. Saving the money will generate long-term benefits (a more enjoyable retirement). In the same way, addressing the challenges of climate change now requires taking actions that can be hard or unfamiliar. Social scientists even have a name for this—temporal discounting. Temporal discounting means that humans have the tendency to place greater emphasis on rewards in the present term, even if a long-term opportunity may be more beneficial (CRED 2009).

The implications of climate change require scientists and non-scientists alike to work together on viable solutions. Scientists agree that climate change is occurring, but some of the impacts in exact locations are harder to identify. The issue becomes more complex when it becomes clear all the ways that our lives may be affected: agricultural productivity, water availability, exposure to extreme events, and ultimately economic productivity and social well-being. Climate change touches everything that we do. It can be tough to know how and when to begin climate change adaptation and what that will mean.

It is clear, however, that adaptation to changes in the climactic system will require a multifaceted approach. That is why so many organizations around the world acknowledge the challenges of climate change and are working toward solutions. The World Economic Forum, the World Bank, the reinsurance industry, and large corporations such as Morgan Stanley are but a few examples. Though they may seem to be unlikely partners, let's explore some of the groups working on the issue—cities around the US, the national security community, and social scientists—and some lessons that can be learned from their approaches.

CITIES

In the US more than 50% of Americans—164 million—live in coastal and Great Lakes watershed counties, and together they help generate 58% of the national GDP (Moser and others 2013). From Miami to New York City to San Francisco, millions of Americans especially live in urban areas along the coast. These cities are home to commerce, science and technology, banking, and innovation. As climate change progresses, cities will become increasingly vulnerable to sea level rise and severe weather. When extreme events like Hurricane Sandy combine with aging infrastructure and sea level rise, the result can directly impact quality of life in an urban area, yielding social and political challenges.

This reality is not lost on city leaders around the US, and many cities are actively developing adaptation strategies to address the challenges that climate change will cause. They are implementing climate adaptation plans, driving energy reduction innovation, and analyzing future infrastructure needs. In the case of climate change adaptation, cities benefit from their size. Cities account for more than seventy percent of global CO₂ emissions and consume over two-thirds of the world's energy, but they are also able to develop close relationships with businesses, institutions, and residents because of smaller government, thus allowing policies to be implemented more quickly (C40 2013).

Shaping today's cities into those urban hubs of the future—ones that will support increasing populations, all while dealing with fewer resources and more exposure to climate change—requires an all-hands approach that starts with the interest of high-level leadership. The approach must communicate the issues clearly to stakeholders and engage citizens in a deliberate process that makes sound decisions based on scientific data. In a similar way, leaders in the US military are coming together to improve energy security and climate change adaptation as crucial pieces of a holistic defense strategy.

NATIONAL SECURITY

In 2010, the Quadrennial Defense Review (DOD 2010), the Defense Department's four-year review of its strategy and priorities, recognized that climate change and energy will play significant roles in the future of national security, stating that "climate change will shape the operating environment, roles, and missions that we undertake" and "while climate change alone does not cause conflict, it may act as an accelerant of instability or conflict" (DOD 2010).

The US Navy in particular recognized this challenge and in 2009 formed its Task Force Climate Change (TFCC) to address the naval implications of a changing Arctic and global environment (US Navy 2010a). After a long-term decline, sea ice fell in 2012 to its lowest level since 1979 when satellite mapping began (NSIDC 2013). Changing conditions in the Arctic mean an increase in commercial traffic and tourism in the region. This will necessitate increased naval presence to maintain freedom of the seas—as the Navy is required to provide in all oceans of the world. The US Navy is working closely with partners from the other Arctic nations to ensure safe and secure Arctic waters (US Navy 2010b).

In addition, sea level rise may compromise the readiness of the Navy's coastal installations to carry out missions and support the fleet. Drought, storm events, and coastal flooding all could reduce a military installation's ability to function at optimum capacity. Exposure to these physical effects can weaken or alter the built and natural infrastructure components

of military installations and make systems less reliable or effective. Only by continuously monitoring the scientific data of changing conditions and adapting to the impacts of climate change that directly relate to its mission can the US Navy maintain mission readiness in the 21st century.

SOCIAL SCIENCE

Climate change affects all aspects of our daily life, whether we are urban dwellers, members of the military, farmers, or educators. So how might humans make better decisions to adapt to and accommodate these changes? How can scientists, educators, and politicians clearly communicate policy changes needed to improve resilience to natural hazards, public health, economic well being, and the many other areas of our lives that climate change will touch?

To answer these questions, one must look to social science. Climate scientists provide valuable information about the climate system and the impacts of its changes on our institutions and way of life that can then be distilled into a usable format for decision makers, educators, planners, and the general public. The disciplines of psychology, anthropology, sociology, economics, and other social sciences provide the framework necessary to guide decision- and policy-making under conditions of uncertainty.

Organizations like the Center for Research on Environmental Decisions (CRED) at Columbia University's Earth Institute are doing just that. CRED studies how people use scientific information, the social context in which scientific information is discussed, and how information and choice options are framed to address human responses to climate change and variability. By working with natural scientists, educators, field researchers, and the general public (including policy makers, planners, and private business), CRED aims to understand and improve how people make environmental decisions under conditions of uncertainty (CRED 2009).

This research tells us that for climate science information to be absorbed by audiences, it must be actively communicated with appropriate language, analogy and metaphor; combined with narrative storytelling; made vivid through visual imagery and experiential scenarios; balanced with scientific information; and delivered by trusted messengers in group settings (CRED 2009). By learning how to address scientific and climate uncertainties, practitioners and educators can foster the behavior change necessary for climate change adaptation.

CONCLUSION

The future of climate change can at times seem daunting. Climate science predicts challenges that a planet with seven billion people must overcome to continue to thrive on earth. And yet, as examples from the urban planning, national security, and social science communities show, meeting these challenges will depend on the expertise and actions of many different organizations. Employing expertise at all levels, engaging high-level leadership, relating the challenges back to one's mission, and clearly communicating the benefits of action and the downsides of inaction can contribute toward a robust solution and an improved ability to respond to this challenge, for us and our children.

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