

A photograph of Ash Carter, former Defense Secretary, speaking to a group of people. He is wearing a dark suit, a white shirt, and a blue patterned tie. He is seated in a chair with a grey patterned backrest and is holding a white envelope. He is gesturing with his right hand while speaking. The background is blurred, showing a group of people in a room.

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Threat Multiplier: The Growing Security Implications of Climate Change

A Conversation with Sherri Goodman

Interviewed by Eli Stiefel

Fletcher Security Review: Ms. Goodman, thank you very much for speaking with me today. As you know, the topic for this year's publication, "Making Waves," focuses on geopolitics, energy, and the environment. Our aim is to expand the definition of security to include more than the military and hard power. In line with this proposition, from your perspective, which environmental issues, in general, pose the greatest security challenges?

Sherri Goodman: Well climate change is one of our greatest security challenges particularly because some parts of this administration are ignoring it. Not our military, but regardless, this is still among the greatest of the threats we face. Ten years ago, the first CNA (Center for Naval Analysis) Military Advisory Board Report, which I founded and led, characterized climate change as a threat multiplier. This is still the appropriate framing for understanding climate risks; particularly extreme weather events, sea level rise, increased drought in certain areas and precipitation in others. The changes in the natural environment from climate change are leading to many second order effects such as migration, instability, health insecurity, the list goes on. We need to understand these forces as drivers of instability and potential conflict when we formulate our national security strategy.

FSR: You mention something that I am particularly interested in and I think is very important: the need to focus on different environmental threats as pieces of the puzzle in forming national security strategy. Would you say that the relative focus on this idea changes across administrations, or is there a general consensus on this? How able are military leaders and planners to transcend the 'surface politics' that we see in the news around this issue daily?

SG: Well, the current Secretary of Defense, General Jim Mattis, has been very clear on this subject. He has said [in his answers to the Senate Armed Services Committee's 'Questions for the Record,'] that "climate change

can be a driver of instability and the Department of Defense (DOD) must pay attention to potential adverse impacts generated by this phenomenon." He also said that "the Department should be prepared to mitigate any consequences of a changing climate including ensuring that our shipyards and installations will continue to function as required." Other senior leaders, from the Secretary of the Navy on down, have echoed those same views. DOD continues to move pretty much full steam ahead in understanding climate risks and developing resilience and adaptation policies. I cannot say that it is helpful that parts of the administration are trying to ignore those same risks, but none-the-less, I think that the military leadership understands it affects military operations.

FSR: Beneath what we might call 'political rhetoric,' is there a general continued movement and growing understanding and acceptance in the career government of this problem?

SG: Yes. Absolutely. Military leadership and career members of our forces are working on a regular basis with our allies around the world where these risks are also well recognized and are increasingly part of how we plan and conduct operations. For example, the Arctic is warming at more than twice the rate of the rest of the planet. Sea ice has shrunk to such an extent that there is a very active effort to advance shipping and energy exploitation across the Arctic. This is made possible by climate change. Now we are having to think about deploying surface forces to reach into the Arctic in a way that we never had to do in the pre-climate change Cold War era. Climate change is causing us to restructure and reset our forces. In another example, as a result of the hurricanes we experienced this fall — Harvey, Irma, and Maria — in Texas, Florida, and Puerto Rico, we had to deploy our military to support civil authorities to help provide relief to citizens in need; to provide water and food, and help turn the lights back on. While Defense Support to Civilian Authorities, as it is called, is a defined mission, our forces were called up to such an ex-

tent for those hurricanes that we had to slow the flow of forces into Afghanistan last fall because our troops were deployed in the homeland. Climate security has now very clearly become a homeland defense mission.

FSR: At a Center for Strategic and International Studies (CSIS) panel dealing with these issues in 2016, they discussed how the United States is generally the first responder for global events, including disaster events like the recent hurricanes. As these become more common and more violent, it seems clear that we may have to make some choices and tradeoffs in terms of what we get involved in. Similar to how we had to slow down the deployment and movement of troops in and out of Afghanistan, what are some other areas in which the United States might have to make tradeoffs?

SG: The Arctic is one. We have to build a new ice breaker because we have an aging ice breaker fleet. We need more capability. The Air Force and the other services are looking at how to redeploy forces in that region. We are also experiencing destructive wildfires that require extensive military support to help supplement our first responders and firefighters. Additionally, we are finding that conflicts in which we are involved across the Middle East and Africa, from Syria to the Arab Spring uprisings and across much of the Sahel, to include the terrorist activities of Boko Haram and other ISIS-related violent extremists, are intensifying, in part, due to shortages that are occurring in water and food

related to climate change. For example, Lake Chad, was once the wellspring of life support for the four countries that border it, Nigeria, Chad, Mali, and Niger. It has now shrunk to a fraction of its original size. That has in part allowed Boko Haram and other insurgents to take advantage of communities that are highly water-stressed and water-scarce that can no longer farm and fish along the shores of the lake. These groups have had to migrate inland and in doing so become vulnerable and desperate.

FSR: This seems to implicate the issue of government legitimacy and the social contract. Based on the evidence, it seems that climate change could aggravate even relatively stable countries.

SG: Yes. Just look at what happened in Puerto Rico! Look at the instability that occurred when an entire part of America was devastated by a hurricane and could not turn the power on or provide adequate food, shelter, and water for many weeks. That undermines the legitimacy and authority of government. I think we are feeling that increasingly world-wide. In fact, not so long ago, inadequate response to climate change-fueled wildfires in Australia contributed to the toppling of the government there.

Australia has a lot of the same challenges that the United States does politically, in that it is a robust democracy but it is also a very fossil-heavy economy. It is depen-



Puerto Rico Army National Guard Members work on clearing a high in Puerto Rico in the aftermath of Hurricane Irma (Spc. Agustin Montanez / Public Domain)

dent on coal and mining and fossil extraction. This means that there are deep domestic challenges in coming to grips with how to move to a more resilient, and lower-carbon, service-based economy in the future. You see that innovation happening now across the United States and across the world. It is just a matter of how fast it will happen and whether it will happen in time to address the greatest risks from climate change.

FSR: Earlier, you mentioned the CNA Military Advisory Board and the series of reports that have been put out. I wanted to ask you a bit about the idea of ‘advanced energy’ that is put forward in the June 2017 report. In the report, the energy posture of the United States is described as needing to adapt to longer-term changes in how energy is produced, stored, distributed and used. Similar to what we were just talking about in Australia. There is a shared problem between those two countries and the whole world. Can you give me an idea of what that future might look like for the United States, both for the regular domestic economy and also for the military and geopolitical relationships that the United States is a part of?

SG: In that report on advanced energy, the first thing to address is what *is* ‘advanced energy?’ We defined it as the suite of technologies and systems that can lead to a more globally accessible, clean, and safe energy supply. That could include nuclear, hydro-renewable alternative power, and associated technologies and systems that distribute, store, and manage energy. We observed that changing energy postures are going to affect the global economy and that this will have direct impacts on the United States’ national security.

The military’s approach to advanced energy is pretty simple. When the performance of a system using advanced energy is comparable to or an improvement upon an old system, you should use the new system, especially where it improves the effectiveness and/or resiliency of military operations. In Afghanistan, as Secretary Mattis has pointed out, we sought to find a way to relieve our forces of the tanker trucks carrying fuel oil that are easy targets. Why operate this way when you can find cheaper, lighter, and equally effective energy sources? Why not create the electricity at our military bases through renewable sources like wind and solar using micro grids other methods available to our forces? These techniques improve readiness and reduce risk.

FSR: Are there similarities or differences in how this transition system might grow or succeed between civilian sectors of the economy and the military? You talk about the fuel convoys as targets. I know there have been problems with that. Might there be dual-use properties to technologies that emerge from seeking to solve similar problems? What might this look like going forward?

SG: In the Cold War, the military was really seen as a technological leader. Spin-off technologies from the military sector into the civilian sector were common. In fact, I was present at the creation of a program sponsored by my former boss, Senator Sam Nunn, in 1990, called the Strategic Environmental Research and Development Program, which was designed primarily to enable technology advances in the military sector during the Cold War to be made available to address growing environmental challenges. This program sought to confront everything from cleaning up military bases to conservation of natural resources and improved energy. It even conducted some research on climate change. That was 1990. Today, it has totally flipped. The civilian and commercial sector are really churning out technology advances and the spin-off is coming from the commercial sector into the military. DOD today is actively seeking innovations from the private sector in everything from energy, to resilience, improved water, and cyber threats, and health technologies. In fact, DOD recently created the Defense Innovation Unit in Silicon Valley in order to better understand tech innovation there and bring it into the military.

Lead times for developing, testing, and approving technologies in the defense acquisition process have become too cumbersome. It takes so long, a decade or so, that when you decide to build a new nuclear submarine, as we are now, by the time it is operational, the technologies that were included have already become old. That is the problem with government acquisition. There are various programs, like advanced technology demonstrations, to try to enable our forces to better take advantage of tech advances.

There are also a lot of common challenges that military bases and communities face. Many people want both to move to more resilient forms of energy so that they will be less threatened by potential power outages, either from a hacking attack, or natural disaster. Many cities and military bases, which are often like small cities, are

trying to develop more resilient approaches, like micro-grids. Such a setup would be able to ‘island’ critical military functions so that if the main power goes out, hospitals and other essential infrastructure will not shut down. Bases often provide backup power into the community for essential functions as well.

FSR: It seems, based on what you are saying, that resilience is an area where a lot of the planning and technology can be shared between the military and the civilian sector. This seems like a good development.

SG: Yes, this is true in a lot of key areas. Resiliency is in part about understanding what your vulnerabilities are and particularly, where you have critical loads that can fail. If you are dependent on a single power source to a hospital for example, that is not a good thing. If your backup generator is in the basement, and you are in an area that floods a lot, as we have learned the hard way in the Gulf region and along much of the East Coast, those backup generators should be somewhere else.

FSR: How much conversation is there about the little operational things like that between industry and government and the think-tank world? Is this something that is just starting, or has it been going on for a long time?

SG: This has been going on for a while. What DOD contributes, in part, to furthering the advanced energy transition across the country, is that it often has to manage its energy needs on a larger scale. For example, the largest initial solar power housing in the United States was on a military base in Hawaii. Hawaii is obviously a good place for solar power, we have a lot of troops in Hawaii, and we have a lot of family housing. Some years ago, DOD privatized much of the military base housing, enabling more innovation to be had in how that housing is developed and how it is powered. Because our military is big, it can do things at scale. That is often what is needed to move new technologies into operation and to give opportunities to entrepreneurs to move beyond conventional systems.

FSR: In relation to the environment, China has been described as a country that has, to an extent, sacrificed its environment at the altar of development. Recently

there have been some attempts to reverse the detrimental impacts. One area in which this has happened is in China’s acceptance of recycling or waste products from other countries. There has also been action limiting when Chinese citizens can drive cars. I am wondering, because of China’s importance in recycling and waste disposal, but also more importantly in producing microchips and microprocessors, which is fairly dirty and chemically intensive, as China potentially continues to move in this direction of wanting to clean up its environment, what kind of security impacts might this have on countries that do a lot of business in these industries with China?

SG: On the one hand, it creates opportunity in our growing advanced energy sector for innovation. The United States is still a leader in innovation, though we are not always the leader in the basic manufacturing. For example, China now produces more solar panels

than we do, but the United States is certainly leading in advanced energy innovation, in micro grids. The next big thing is going to be battery storage. China is certainly a major buyer. They are increasingly motivated at the local level by the health risks from pollution, particularly air pollution. In the mega-cities, kids increasingly suffer asthma or stunted growth and, on a regular basis, people cannot go outside due to horrible smog. There is a

lot of constructive change going on at the local level in China in order to enable economic growth to be robust. This is spurred by the Chinese government’s realization that economic and environmental protection have to go together. They do not have a tradition or history of environmental enforcement in the way that the United States does, and their community does not function quite the same way, so any changes in this direction will certainly be a patchwork. This is not so different from the variability in our own country between certain sectors however. In oil or coal country, at the source, people are much more willing to accept the risks associated with extraction of energy because they get the direct economic benefits in the form of jobs. Whereas,

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when you are in a city like New York or Boston, where the economy is not fossil-fuel dependent, but service oriented, people want clean sources of energy and clean air.

What I also observe has happened in the last year is that, without any deliberate attempt on China's part, they have been able to steal a march on U.S. global leadership on climate change because we have retrenched. It is not that China necessarily aspires to that mantle in particular, but it can use it to its diplomatic, economic, and political advantage. And it certainly is across the Asia Pacific region, where countries from Singapore to the Philippines and Vietnam are experiencing serious economic, political, and in many ways, increasing natural resource risks, whether it is the rising tide, or the rising waters of the Mekong, which is the economic life-blood of Vietnam. Further, global fish stocks are increasingly depleted. If we do not pay attention to the fact that ocean acidification and warmer temperatures are affecting global fish stocks, not to mention illegal fishing, we will miss significant global food security and ecosystem risks.

FSR: What about plastics in the ocean? Is there any attention to the increasing amount of plastics in the ocean from a defense point of view?

SG: Well, I entered the defense department in 1993 and at that time, the United States had just joined an international protocol called the London Dumping Convention, which prohibited the dumping of waste, including plastics, into the oceans. During my time in Defense in the 90s, the Navy became a real leader in recycling plastics and prohibiting the release of plastics and other

toxic waste from its ships. I still have, to this day, a wonderful disk of the plastic disposed of by a Navy ship. It looks very colorful, almost like artwork. Every ship has a plastic compressor to help contain waste and the U.S. military has been a real leader in reducing waste from its operations. In the last couple of years, former Secretary of State John Kerry has held several oceans conferences in the United States, both of which I attended. Each had a different theme. One was ocean plastics. There have been major initiatives undertaken. In fact, just yesterday, I was in a meeting with Dell's Chief Supply Chain Officer and he talked about their ocean plastics recycling program. There are a number of companies like this that have taken on ocean plastics. I think Japan has set a goal of reducing its plastics into the ocean by 80% within a certain period. Also the EU and China. There is a much greater awareness now. People are very aware that there is an almost state-sized conglomeration of plastics floating around the Pacific and understand how awful that is after seeing pictures of birds and other wildlife entrapped in plastic bags. In part because of this, there are increasingly good alliances between private industry and non-profit organizations that are trying to move the needle on this.

FSR: Ms. Goodman, thank you very much for sitting and having this conversation with me. It has been really fascinating.

SG: I really appreciate your doing this.

Sherri Goodman

Sherri Goodman is an experienced leader and senior executive, lawyer and director in the fields of national security, energy, science, oceans and environment. She is a Senior Fellow at the Woodrow Wilson International Center and CNA (Center for Naval Analyses), and a Senior Advisor for International Security at the Center for Climate and Security. At CNA, Goodman also served as Senior Vice President and General Counsel and was the founder and Executive Director of the CNA Military Advisory Board, whose landmark reports include National Security and the Threat of Climate Change (2007), and National Security and the Accelerating Risks of Climate Change (2014), Advanced Energy and US National Security (2017), and The Role of Water Stress in Instability and Conflict (2017), among others. Previously, she served as the President and CEO of the Consortium for Ocean Leadership. From 1993-2001, Goodman served as the first Deputy Undersecretary of Defense (Environmental Security).