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House Committee on Foreign Affairs Hearing: "How Climate Change Threatens U.S. National Security"

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Chairman Engel, Ranking Member McCaul, and Members of the Committee, thank you for the opportunity to testify today and for calling this hearing on such an important and timely topic.

Throughout my career in development, first at the U.S. Agency for International Development (USAID) and now at RTI International, I have been honored to work in several countries and regions, overseeing U.S.-supported programs related to agriculture, the environment, global health, and more. Some of the countries in which I have worked, such as Zimbabwe, experienced significant instability and conflict while I was there. The topic of today's hearing brings to mind two important truths that I have observed throughout my career: first, other countries' development affects U.S. national security; second, climate affects development.

Put simply, American national security interests benefit when countries are stable and secure, and are able to meet the basic needs of their citizens. This is why development is rightly considered, along with defense and diplomacy, one of the "three Ds" of U.S. national security.

Developing countries are particularly vulnerable to climate-related events and trends, including extreme weather and erratic weather patterns, because they can threaten basic needs for survival, such as food security and water security. This vulnerability has consequences for U.S. national security. When a country is unable to meet the basic needs of its citizens, including enabling reliable access to food, water, and economic opportunity, instability is very often not far behind. This is even more true for countries where governments have weak capacity to respond to shocks and local institutions are fragile.

USAID Administrator Mark Green has rightly raised the question of how U.S. foreign assistance can "foster resilience in people and communities so they can withstand future crisis, or better yet, lead normal lives."[1] As climate change contributes to crises and instability in the developing world, holistically supporting the development of vulnerable countries and communities is the best way to strengthen their resilience, bolster self-reliance, and foster stability and security.

[1] USAID, "USAID Administrator Mark Green Delivers Remarks at the Opening Session of Global Innovation Week," September 28, 2017. https://www.usaid.gov/news-information/press-releases/sep-28-2017-usaid-administrator-mark-green-delivers-remarks-opening-session

An increasingly vulnerable world

Recent progress in strengthening global food security is now at risk. Global food prices spiked in 2007–2008, then declined for nearly a decade. Since 2014, however, the prevalence of food insecurity and undernutrition[2] has increased. The amount of undernourished people globally grew from around 804 million in 2016 to 821 million the following year. That is an increase of 17 million people in just one year suffering real consequences from not having enough, and the right kinds, of food.

Driven primarily by climate variability and conflict, famine threatened the lives of an estimated 20 million people in Nigeria, Somalia, South Sudan, and Yemen in 2017.[3] More broadly that year, nearly 124 million people in 51 countries and territories faced food crises, an increase from 80 million people in 2015 and 108 million people in 2016.[4]

Looking ahead, the global population is expected to reach 9.8 billion in 2050,[5] increasing pressure on an already resource-scarce planet. Globally, we will need to produce 60 percent more food than we do now in order to feed this larger population.[6] At the same time, crop yields are expected to decrease for maize, rice, and wheat, three of the world's most important food crops.[7]

Demand for water is projected to increase between 30 and 50 percent by 2050.[8] Approximately 2.4 billion people live in water-scarce regions, and more than one-half of the global population could be at risk of water stress by 2050.[9] Water scarcity and insecurity are making it more difficult to meet the demand for water for agriculture, energy generation, and other needs. The 2017 *U.S. Government Global Water Strategy* states that some regions could see a decline in economic growth due to decreasing water supplies and increasing demand, with major

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[2] Food and Agriculture Organization of the United Nations (FAO), "2018: The State of Food Security and Nutrition in the World." http://www.fao.org/state-of-food-security-nutrition/en/

[3] Jane Ferguson, "20 Million Starving to Death: Inside the Worst Famine Since World War II—A Report from South Sudan," Vox, June 1, 2017. https://www.vox.com/world/2017/6/1/15653970/south-sudan-hunger-crisis-famine

[4] FAO, "2018: The State of Food Security and Nutrition in the World." http://www.fao.org/state-of-food-security-nutrition/en/

[5] United Nations Department of Economic and Social Affairs, "World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100," June 21, 2017. https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html

[6] Nikos Alexandratos and Jelle Bruinsma, *World Agriculture Towards 2030/2050: The 2012 Revision*, Agricultural Development Economics Division, FAO. http://www.fao.org/3/ap106e/ap106e.pdf, p. 7.

[7] Rosegrant et al. https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201811071654---CLI%20Submission%20IFPRI%20report%20full%20size.pdf, p. 57.

[8] Chicago Council on Global Affairs, *From Scarcity to Security: Managing Water for a Nutritious Food Future*, March 2019. https://www.thechicagocouncil.org/sites/default/files/report_from-scarcity-to-security_20190321.pdf, p. 14.

[9] Claudia Ringler et al., "Role of Water Security for Agricultural and Economic Development – Concepts and Global Scenarios," in *Handbook on Water Security*, ed. Claudia Pahl-Wostl, Anik Bhaduri, and Joyeeta Gupta (Cheltenham, UK: Edward Elgar Publishing Limited, 2016), pp. 183–200.

implications for global food security and regional stability.[10] In the same report, the State Department noted that "[t]he Department views water security as an issue of national security."[11]

Agriculture is the backbone of the economy in many developing countries and is highly susceptible to water shortages, among other climate-related factors such as temperature, erratic rainfall patterns, and pests. The poorest, most vulnerable farmers typically depend on the rain not just for their livelihoods, but also to provide daily food for their families. Diminished opportunities in agriculture harm economic growth, health, and employment, and drive migration both internally and externally in many developing countries.

On the health front, rising temperatures are affecting the transmission of diseases, particularly those that are transferred through water and insects. As average temperatures around the world rise, mosquitoes that transmit malaria, dengue, chikungunya, yellow fever, and Zika have become more widely distributed and more abundant. We have seen such phenomena even in the United States in the past decade with West Nile virus and Lyme disease, as the mosquitoes and ticks transmitting them have expanded their range. Increased burdens from these diseases place further stress on health systems that already struggle to respond to acute crises and outbreaks. As we witnessed during recent epidemics of Ebola and Zika, diseases respect no borders. Stronger health systems abroad make us safer at home.

Developing countries are especially vulnerable to these and other threats because they may already be struggling to meet the basic needs of their citizens related to food, nutrition, education, health, economic opportunity, good governance, and more.

Among the most vulnerable are the approximately 500 million smallholder farmers[12] around the globe, many of whom are on the cusp of hunger and food insecurity. I have spoken with smallholder farmers in many geographically disparate countries, such as Kenya, Senegal, Uganda, Cambodia, and Peru. I've asked them about the biggest challenges they face. Many say climate change. They talk about changing weather patterns and how they no longer know when rain is coming. They say that pests that they never had to deal with before are damaging crops. They also talk about more droughts, floods, and other weather-related challenges. For these individual farmers and their families—and by extension their communities and countries—their ability to respond to these climate-related perils can mean the difference between a life of dignity and one of desperation. In countries where the government has limited capacity or sometimes unwillingness to support poor households in responding to these issues, the consequences are often more dire.

Another particularly vulnerable group is youth. Young people from rural communities throughout the developing world are increasingly migrating to urban areas in search of better opportunities, placing them at risk of social marginalization, a loss of community and family

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[10] *U.S. Government Global Water Strategy 2017.* https://www.usaid.gov/sites/default/files/documents/1865/Global_Water_Strategy_2017_final_508v2.pdf, p. 7.
[11] *U.S. Government Global Water Strategy 2017.* https://www.usaid.gov/sites/default/files/documents/1865/Global_Water_Strategy_2017_final_508v2.pdf, p. 13.
[12] Sarah K. Lowder, Jakob Skoet, and Terri Raney, "The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide," *World Development,* Volume 87, November 2016, pp. 16–29. https://www.sciencedirect.com/science/article/pii/S0305750X15002703

structure, and recruitment by gangs and extremist organizations. We can expect this trend to grow as rural areas struggle with the impacts of climate variability.

A threat to security and stability

These trends are deeply concerning for global security. Whatever the drivers of a particular food, water, economic, or health crisis, one thing they all have in common is the potential to undermine and inflame fragile social, economic, and security situations. Water and food are the most basic of human needs. They are affected by many complex factors, including climate, demographics, global economic pressures, government policies, and private investment. It is clear, however, that when they are not available in sufficient supply, families and communities react, taking the actions they deem necessary to survive.

The 2019 *Worldwide Threat Assessment of the U.S. Intelligence Community* by the Director of National Intelligence addresses why these developments concern the U.S. national security community. According to the Assessment, "Global environmental and ecological degradation, as well as climate change, are likely to fuel competition for resources, economic distress, and social discontent through 2019 and beyond." The Assessment further notes that "[c]hanges in the frequency and variability of heat waves, droughts, and floods—combined with poor governance practices—are increasing water and food insecurity around the world, increasing the risk of social unrest, migration, and interstate tension in countries such as Egypt, Ethiopia, Iraq, and Jordan." [13]

Droughts that occurred in Syria between 2006 and 2011 caused 75 percent of crops to fail and an 85 percent loss of livestock. This crisis fueled the migration of more than one million Syrians from rural to urban areas. Observers believe this displacement added to the domestic instability surrounding the country's civil war,[14] creating fertile ground for ISIS and forcing more than 5.6 million Syrians to leave the country as refugees.[15] Globally, the International Organization for Migration found that between 2008 and 2017, an average of 25.3 million people had been displaced annually, the vast majority due to disasters rather than violence. The organization further found that in 2016, 97 percent of people who fled their homes did so due to "disasters triggered by climate and weather-related hazards."[16] The World Bank has estimated that by 2050, more than 140 million people in sub-Saharan Africa, South Asia, and Latin America could be driven from their homes as "climate migrants."[17]

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[13] Daniel R. Coats, *Worldwide Threat Assessment of the US Intelligence Community*, delivered to the Senate Select Committee on Intelligence, January 29, 2019. https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf, p. 23.

[14] Chicago Council on Global Affairs. https://www.thechicagocouncil.org/sites/default/files/report_from-scarcity-to-security_20190321.pdf, p. 22.

[15] World Vision, "Syrian Refugee Crisis: Facts, FAQs, and How to Help." https://www.worldvision.org/refugees-news-stories/syrian-refugee-crisis-facts

[16] International Organization for Migration, *World Migration Report 2018.* https://publications.iom.int/system/files/pdf/wmr_2018_en.pdf, p. 38.

[17] The World Bank, "Climate Change Could Force Over 140 Million to Migrate Within Countries by 2050: World Bank Report," March 19, 2018. https://www.worldbank.org/en/news/press-release/2018/03/19/climate-change-could-force-over-140-million-to-migrate-within-countries-by-2050-world-bank-report

In Nigeria, as noted by Ambassador John Campbell before the House Committee on Science, Space, and Technology in 2017, agricultural and grazing land is claimed each year by the Sahara desert, leading to higher levels of impoverished herders and farmers. At the same time, Lake Chad is shrinking. As the Ambassador testified, "Less arable land, less water, and more people are a recipe for a cycle of violence." This truth applies to any country. As Campbell notes, in Nigeria it has encouraged the rise of Boko Haram.[18]

Maintaining the momentum: Continuing America's smart investment in development

Poverty is a driver of vulnerability, but it's clear that other factors, including climate, exacerbate poverty and compromise the progress we're making. The best chance we have to promote resilience to crises is to address the underlying causes of poverty and insecurity, and to strengthen systems to withstand climate-related pressures. Tackling these causes requires strong, consistent U.S. leadership to support multisectoral, integrated approaches—for instance, those looking holistically at the complex interplay of food security, nutrition, water, energy, and governance. Equally important, it requires development programs that promote local ownership, sustainability, and self-reliance.

As Administrator Green has said, the ultimate purpose of foreign assistance is to end its need to exist.[19] Development is hard work and not every program is successful. But resounding success stories are all around us and illustrate the strong economic return on a relatively small investment in foreign assistance. Let me start with an example from the health sector that shows how we can achieve lasting solutions to very difficult problems. USAID's neglected tropical diseases (NTD) program[20] has supported the elimination of certain insect-borne NTDs in Ghana, Togo, Laos, Cambodia, Vietnam, and Nepal. The program proves that fundamentally solving—not just reducing—complex development challenges is possible. Congress's investment in USAID NTD programs has resulted in more than 100 million people no longer at risk for trachoma, and more than 250 million no longer at risk for lymphatic filariasis. In other words, we are winning the global fight against NTDs and moving ever closer to the day when the interventions that USAID supports to combat them will no longer be needed. Also in health, tremendous results have been achieved through the U.S. President's Emergency Plan for AIDS Relief and the U.S. President's Malaria Initiative.

Over the course of my career, I've seen significant changes in the way international development programs are carried out. Across all sectors in development, programs have embraced the best lessons of modern management. They are harnessing new technologies to reach scale, and utilizing scientific techniques to improve program monitoring and evaluation. Just as important,

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[18] John Campbell, "National Security Implications of Climate Change," delivered before the U.S. House Committee on Science, Space, and Technology, July 12, 2017. https://www.cfr.org/blog/national-security-implications-climate-change

[19] Michael Igoe, "USAID Chief Mark Green's First Day at the Office," Devex, August 8, 2017. https://www.devex.com/news/usaid-chief-mark-green-s-first-day-at-the-office-90835

[20] RTI implements ENVISION, USAID's flagship NTD program: "ENVISION: A World Free of Neglected Tropical Diseases—Controlling and Eliminating Seven Neglected Tropical Diseases in Low-Income Countries Around the World," n.d. https://www.rti.org/impact/envision-world-free-neglected-tropical-diseases

they are using that information to course-correct and achieve better results. Many programs are working across multiple sectors to promote more holistic solutions and better outcomes, such as food security programs that are also improving child health and nutrition. Whatever their focus, programs are most effective when they are designed to strengthen local government systems in order to build countries' capacity to take ownership of their own development journey, to engender trust from their citizens by providing better public services, and ultimately to move from dependence on aid to self-reliance.

Other specific opportunities exist to improve global food and water security.

I appreciate how USAID is revamping its structure to better draw together its efforts in food, water, nutrition, and resilience, among other sectors. The challenges of climate-driven food and water insecurity are complex and interrelated. They must be tackled together, and this reorganization promises to strengthen the Agency's ability to develop and implement effective, integrated solutions to global food and water security challenges.

Advances in technology and improved farming practices promise to help farmers increase production in an environmentally sustainable manner. Drought-resistant seeds, drip irrigation, precision application of fertilizers and agrochemicals, better pest management, improved livestock breeding, conservation farming, and improved watershed and soil management can all help increase production and enhance climate resilience.[21] Introducing these technologies in impoverished areas and getting farmers and herders to adopt them requires a sustained commitment, but it is money well spent to prevent a backslide into insecurity and conflict.

Technology is also producing better awareness and foresight. Using internal funding, RTI is developing a model to help agricultural stakeholders in Rwanda more readily identify what crops will grow and when, such as whether maize will grow in a certain region by 2030.[22] Helping farmers, the private sector, and governments identify areas more likely to experience changing agro-ecological conditions—and significant corresponding changes in the production process—will also help identify emerging threats to food security and ways to mitigate them.

Similarly, as part of a USAID-funded program in the Philippines,[23] RTI developed water resource maps for the conflict-prone island of Mindanao, which produces about 40 percent of the country's agricultural output. The study projects the water resource status of water-rich and water-stressed areas a decade into the future, based on assumptions on climate change and land use. This information revealed that the region's top four agricultural exports, which are all water

[21] Paul Weisenfeld and Anna Wetterberg, "Technological Advances to Improve Food Security: Addressing Challenges to Adoption," Research Brief, RTI Press, October 2015. https://www.rti.org/sites/default/files/resources/rti-publication-file-7e1980eb-b8d1-42f0-8db4-d58bb8bfa58c.pdf, p. 2.

[22] RTI Grand Challenge project: "Using Satellite Images and Artificial Intelligence to Improve Agricultural Resilience: An RTI Grand Challenge," n.d. https://www.rti.org/impact/using-satellite-images-and-artificial-intelligence-improve-agricultural-resilience

[23] "B-LEADERS (Building Low Emission Alternatives to Develop Economic Resilience and Sustainability): Developing Renewable Energy Resources and Increasing the Resiliency of the Electrical Grid in the Philippines," n.d. https://www.rti.org/impact/b-leaders-building-low-emission-alternatives-develop-economic-resilience-and-sustainability

intensive, are being planted in water-stressed areas. The study offered suggestions for mitigating the risk and improving water management.

Helping food producers adapt to climate variability can protect food security while saving their livelihoods. For instance, in Somalia, where the livestock sector is critically important to the economy, the RTI team implementing a USAID-funded program[24] noticed that as the dry season began in 2016 and drought was imminent, the lucrative livestock milk supply was at risk. Herds were producing little or no milk due to limited access to water, reduced availability of affordable feed, and higher disease prevalence. The program introduced an innovative camel-leasing model through which privately owned dairy companies lease animals from pastoralists during a drought to ensure sufficient commercial milk supply, with profits shared between the pastoralists and dairy companies. In return, the companies provide the animals with veterinary services, water, and feed. This arrangement helps maintain the nutrition and health of the camels, provides predictable household income, and serves as a model that may be a win–win for the private sector and households. This program reminds us that innovative practices can improve resilience and stability in the face of drought in Somalia.

In Senegal, a Feed the Future-funded project implemented by RTI[25] is working to strengthen the entire food system for staple crops—from farms, to markets, to tables. This includes working with farmers, private sector processors and traders, the government, and the local financial sector to create a stronger system that is more resilient to shocks and stresses and helps vulnerable communities bounce back quicker and more easily when such events do occur. As one example, the project has worked with local insurers and others to help reduce the risk that farmers face if rainfall is insufficient, erratic, or excessive. This has led to the installation of 88 solar-powered, automated rain gauges throughout Senegal's southern zone, which allows insurers to quickly access rainfall data and accurately determine when farmers may be at risk of failed production, and to then compute rain-indexed insurance payouts. Through this risk-mitigation tool, smallholder farmers are more likely to invest in quality inputs that yield more and generate better-quality products demanded by buyers.

Many other things can be done, and are already being done, to strengthen food security, water security, and broader development around the world. The United States has a long and distinguished record as a global leader of which it should be proud. The Food for Peace program, founded by President Eisenhower in 1954, is one of our most enduring success stories. The program has provided food to more than four billion people in need for more than six decades.[26]

More recently, the Initiative to End Hunger in Africa, started during the George W. Bush administration, evolved into the global Feed the Future initiative in the wake of the 2007–2008 global food-price crisis. I want to thank this Committee for your role in strengthening and institutionalizing this effort with the bipartisan Global Food Security Act in 2016 and its reauthorization last Congress. Feed the Future helps lower-income countries to boost their food

[24] The USAID Somalia Growth, Enterprise, Employment, and Livelihoods (GEEL) program.
[25] "Feed the Future Senegal Naatal Mbay: Facilitating Market Opportunities for Grain Producers in a Country Striving for Self-Sufficiency," n.d. https://www.rti.org/impact/feed-future-senegal-naatal-mbay
[26] USAID Office of Food for Peace web pages. https://www.usaid.gov/who-we-are/organization/bureaus/bureau-democracy-conflict-and-humanitarian-assistance/office-food

security by reducing poverty and hunger and strengthening their resilience to shocks and stresses. I've already mentioned one example of a highly successful Feed the Future program. Overall, the initiative has helped an estimated 5.2 million families who are no longer suffering from hunger, and helped farmers generate $10.5 billion in new agricultural sales.[27] During my time at Feed the Future, I met women in countries such as Cambodia, Ethiopia, Ghana, Kenya, and Tanzania who tripled their harvests—and, therefore, their incomes—with the help of the initiative.

Many other U.S. development programs, past and present, have achieved tremendous success in saving and improving the lives of the world's poor and vulnerable.

Development strengthens U.S. national security

President Reagan once said, "Our national interests are inextricably tied to the security and development of our friends and allies."[28]

It's clear why this is true. When development fails, states fail. When development is threatened—by climate change or anything else—U.S. national security is threatened.

When the United States invests in development, we're investing in security. Whether we are helping countries strengthen food security, better manage their scarce natural resources such as water, improve health, eliminate diseases, improve early grade education, bolster economic opportunity, or strengthen democracy, we are helping them take ownership of building a stable future.

The impacts of climate change are intensifying the development challenges that vulnerable people, countries, and regions are already struggling with. They are another reason why U.S. foreign assistance, which promotes stability in some of the world's most fragile areas, is a vital tool for strengthening U.S. national security.

Thank you again for the opportunity to testify. I look forward to answering questions from the Committee.

Paul Weisenfeld is executive vice president for international development at RTI International, an independent nonprofit research institute. In this position, he leads RTI's international development practice, which designs and implements programs across a wide range of sectors to help lower- and middle-income countries and communities address complex problems and improve the lives of their citizens.

Before joining RTI, Mr. Weisenfeld served as a foreign service officer for the United States Agency for International Development (USAID), achieving the highest rank of career minister in

[27] Feed the Future web pages. https://www.feedthefuture.gov/
[28] U.S. Global Leadership Coalition, "President Reagan on Foreign Assistance." http://www.usglc.org/downloads/2015/09/Reagan-on-Foreign-Assistance.pdf

the Senior Foreign Service, and led high-profile initiatives across various international development sectors. During this time, Mr. Weisenfeld directed the Bureau for Food Security at USAID, which leads Feed the Future, the U.S. Government's global hunger and food security initiative. He also led the Haiti Task Team, charged with coordinating relief and reconstruction planning following the devastating earthquake in 2010, and served as USAID Mission Director in Peru and Zimbabwe. Mr. Weisenfeld received the USAID Administrator's Distinguished Career Service Award, the agency's highest award. He served in Africa, the Middle East, and Latin America.

Mr. Weisenfeld holds an honorary Doctorate in Public Administration from Monmouth College, Illinois. He also holds a J.D. from Harvard Law School and a B.A. from Queens College of the City University of New York. He serves on the boards of the U.S. Global Leadership Coalition and the Society for International Development – Washington Chapter.