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Using Science-in-Diplomacy to Develop COAST: The Caribbean Ocean and Aquaculture Sustainability facility, and Reflections on Pandemic Insurance Inspired by COVID-19

Daniel B. Oerther

Resilience – the capacity to recover quickly from difficulties – is a critical aspect of sustainable development. While *ex post* humanitarian aid to alleviate suffering remains the backstop against catastrophic events, this letter from the field emphasizes *ex ante* efforts to obviate the effects of catastrophes before they occur. Insurance, a financial hedge against contingent loss, provides both a means of financial security as well as a means of valuing efforts to reduce risk (i.e., lower insurance premiums may be secured by those who act to reduce their risk). In the Caribbean, small and medium-scale marine capture fisherfolk are exposed to risks that disrupt livelihoods, including weather-related events that result in the loss of gear, vessels, and life, and contribute to food insecurity. Also in the Caribbean, fishing practice is not yet optimized to maintain stocks while maximizing catch. COAST – the Caribbean Ocean and Aquaculture Sustainability facility – is envisioned to bridge the gap among weather resilience, sustainable fishing, and food security for fisherfolk. Originally announced in January 2015, COAST was fully operational for the pilot countries of Grenada and St. Lucia during the 2019 Atlantic hurricane season. The context, inception, and delivery of COAST as well as lessons learned for science-in-diplomacy, including reflections on pandemic insurance inspired by the ongoing impact of COVID-19, are summarized here.

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The Caribbean context

The Caribbean is an ideal test bed for developing innovative solutions for resilience with dozens of sovereign states and overseas protectorates of modest size, which have varying degrees of effective governance and share a regional framework for multilateral collaboration.¹ With its strong self-identity and penchant for piloting new ideas, it is no wonder that the Caribbean is home to CCRIF SPC, the world's first-ever multi-country risk pool.² Established in 2007 as the Caribbean Catastrophe Risk Insurance Facility, today's CCRIF SPC (SPC standing for Segregated Portfolio Company) offers parametric insurance against the perils of tropical cyclones (hurricanes), earthquakes, and excess rainfall and flooding throughout the Caribbean, and since 2015, to Central American countries. The parametric insurance offered by CCRIF SPC is part of an overall package of resilience solutions being developed throughout the Caribbean. This package includes three building blocks, namely: 1) reducing disaster risk before an event through early warning systems, social safety nets, and strategic investments in infrastructure supported by appropriate land use, zoning rules, and building codes; 2) emergency response after a disaster including contingency planning and post-disaster finance; and 3) financial tools that rapidly transition the economy from disaster recovery to sustainable development.³ Originally, the parametric insurance offered by CCRIF SPC was promoted primarily as part of the emergency response to provide a rapid infusion of liquidity into the central treasury of a country immediately after a disaster. But the products now being offered by CCRIF SPC are marketed for strategic use both to incentivize disaster risk reduction before an event (i.e., *ex ante*) and to serve as a first-loss tranche to crowd-in capital as investors begin to view the Caribbean on a protected, long-term path towards sustainable development and prosperity.⁴ It is within this context that the then-United States Secretary of State, the Honorable John F. Kerry, requested an initiative to promote climate-smart food security in the Caribbean, eventually leading to COAST.

COAST inception

In August 2014, then-President Barack Obama hosted the U.S.-Africa Leaders Summit in Washington, DC where trade, investment, and security in Africa were discussed. Not to be left out of an important opportunity to engage collectively with the U.S. government,⁵ in January 2015, then-U.S. Vice President Joe Biden hosted the Caribbean Energy Security Summit in Washington, DC, inviting leaders from across the Caribbean region to discuss both the effects of climate change on extreme weather as well as the opportunity to transition small islands away from a dependence on imported oil and towards locally produced renewable energy.

Ahead of the Caribbean Energy Security Summit, Secretary Kerry requested that his office prepare an initiative to promote climate-smart food security in the Caribbean. As a senior agricultural science advisor in the Secretary's Office of Global Food Security (S/GFS) at the Department of State, the author was part of the team that conceptualized the Caribbean Ocean and Aquaculture Sustainability facility (COAST) to meet Kerry's request. Because of the Secretary's overseas travel to attend the state funeral of King Abdullah bin Abdulaziz Al Saud of Saudi Arabia, U.S. Deputy Secretary of State Antony Blinken announced COAST to the leaders of the Caribbean during a climate change working breakfast hosted at the State Department as part of the summit. COAST was reprised as a deliverable later that year, during the 2015 Our Ocean Conference (OOC) hosted by the Government of Chile,⁶ and highlighted as a centerpiece of Secretary Kerry's remarks at the Milan Expo (later in 2015) in a speech emphasizing that "food security is national security."⁷ The details of COAST have been summarized in peer-reviewed academic literature.⁸ Briefly, the objectives include, "a) creating a new insurance product at an affordable premium; b) informing planning efforts on food security and disaster risk management; and c) promoting technical assistance for climate resilience among participating Caribbean countries."⁹

COAST delivery

Bringing COAST from political concept to commercial insurance product took three critical steps. First, support was needed from within the Department of State, as the donor of funds, and from within the Caribbean, as the beneficiary. Within the Department, the S/GFS, the Bureau of Oceans and International Environmental and Scientific Affairs (OES), and the Bureau of Western Hemisphere Affairs (WHA) were the primary partners. Within the Caribbean, the Caribbean Regional Fisheries Mechanism (CRFM), the Caribbean Disaster Emergency Management Agency (CDEMA), and the Caribbean Community Climate Change Centre (CCCCC) secured support from within their own respective ministries, and facilitated the formal multilateral endorsement of COAST by the Council for Trade and Economic Development (COTED) of the Caribbean Community (CARICOM). Bilateral diplomatic engagement secured public support for COAST from both the Government of Jamaica (which announced the intent to purchase COAST insurance at the 2015 OOC) and the Government of Grenada (which announced the intent to purchase COAST insurance during the 2017 World Economic Forum in Switzerland).

Second, implementation partners were needed. PROFISH (Global Program on Fisheries), a multi-donor trust fund at the World Bank, was selected as the primary repository of a five-million-dollar contribution by the Department of State. Created in 2005, the mission of PROFISH is “to promote and facilitate the contribution that fisheries and aquaculture can make to poverty reduction, sustainable economic growth, better nutrition, and economic opportunities for women.”¹⁰ Within the World Bank, the Vice Presidency for Sustainable Development and the Vice Presidency for Latin America and the Caribbean partnered on COAST. For expertise in the development of the parametric insurance product as well as the long-term sustainable operation of COAST as a commercial insurance product, the World Bank selected CCRIF SPC. The subregional office for the Caribbean of the United Nations Food and Agriculture Organization (UNFAO), the Centre for Environment, Fisheries, and Aquaculture Science (CEFAS) based in the United Kingdom (UK), and The Nature Conservancy (TNC) all provided technical support for COAST.

Third, attention to detail for delivery was needed. At the request of the World Bank and with the approval of the Department of State, the author was recruited by CCRIF SPC to serve as COAST’s Project Implementation Coordinator. COAST integrates bi- and multi-lateral diplomatic relationships, catastrophe modeling, and fisheries management as part of the new insurance product that meets a dual need for short-term profitability and long-term strategic corporate vision. As a professor of environmental engineering with a second baccalaureate degree in biological sciences, the author was equipped to engage in technical conversations about the sustainable management of marine capture fisheries as well as conceptual and mathematical models of tropical cyclones. And because of the author’s prior experience as a Fulbright Scholar to India and his role as Fulbright-ALCOA Distinguished Chair in Environmental Science and Engineering in Brazil, the author brought practical experience as a cultural ambassador and proponent of sustainable development. In the role of Project Implementation Coordinator, the author ensured that the political vision for COAST originally advanced in January 2015 was realized in the final commercial product delivered in July 2019.

Lessons for science-in-diplomacy from COAST

From helping to create the acronym during a weekend brainstorming session to weighing in on the final pricing structure for the product four years later – and with many trips to beautiful Caribbean countries in between – the author had a once-in-a-lifetime opportunity to learn science-in-diplomacy firsthand by contributing to the development of COAST. In August 2014, the author began a

five-year appointment as a National Academies Jefferson Science Fellow, providing scientific advice at the Department of State. Among the three pillars of science diplomacy – namely, science-in-diplomacy, diplomacy-for-science, and science-for-diplomacy – COAST is an example of science-in-diplomacy where “scientific advice informs and supports foreign policy objectives.”¹¹

To share the learning experience of COAST with college students, starting in the autumn semester of 2015, the author integrated a “Diplomacy Lab” into courses at the Missouri University of Science and Technology to “‘course-source’ research and innovation related to foreign policy challenges by harnessing the efforts and students and faculty experts.”¹² The author integrated modeling extreme weather events and sustainable fisheries management as a term-length project into one course,¹³ and created a brand-new course entitled “STEAM (science, technology, engineering, art and math) Diplomacy” to teach science diplomacy to engineering students.¹⁴

One of the biggest opportunities for the author to engage with strategic policy making occurred starting November 9, 2016 when the U.S. awoke to the news that Donald Trump had defeated Hillary Clinton in the 2016 U.S. Presidential election. To ensure its success, the team delivering COAST made a number of strategic decisions in the lead-up to January 20, 2017 “Climate-smart” food security became “weather resilient” and the close link to “Feed the Future,” President Obama’s signature program to address global hunger and food insecurity, was reoriented towards the bipartisan Global Food Security Act of 2016 and the Global Food Security Reauthorization Act of 2018.

It is interesting to note that CCRIF SPC was founded in the wake of Hurricane Ivan and the devastation wrought on the island nation of Grenada in 2004. Similarly, during the development of COAST, in 2017, the Atlantic hurricane season recorded the second worst economic losses on record with widespread damage, including Hurricane Harvey’s heavy rainfall across greater Houston; Hurricane Irma’s devastation to Barbuda, Saint Martin, and others; and Hurricane Maria’s devastating blow to Dominica, Puerto Rico, and others. The experience of these repeated shocks have led to a renewed emphasis on “resilience,” apparent in the recently launched “U.S.-Caribbean Resilience Partnership.”¹⁵

With the successful launch of COAST for the 2019 Atlantic hurricane season, the author used science-in-diplomacy to improve food security, protect livelihoods, and enhance sustainable fishing practices in the pilot countries of Grenada and St. Lucia. Although COAST is currently protecting fewer than 5,000 fisherfolk, the medium-term goal is to scale up COAST to protect nearly 200,000 fisherfolk across the Caribbean, and the long-term goal is to leverage COAST as a model

for improving the lives of the approximately 35 million small- and medium-scale fisherfolk operating in coastal and inland waters around the world.

Reflections on pandemic insurance and COVID-19

In 2012, the countries of the African Union (AU) leveraged the model of CCRIF SPC to establish a continent-wide parametric insurance effort called ARC, or African Risk Capacity. While CCRIF SPC developed the original parametric insurance products for earthquakes and tropical cyclones to provide a “no-strings-attached” rapid infusion of liquid capital to central treasuries in Caribbean nations, ARC designed the original parametric insurance product for drought by incorporating two novel concepts. First, the payout was for a narrow objective, namely to put cash in the hands of small-scale agricultural producers so that when drought damaged crops, the farmers would have cash on hand to purchase food and would not need to kill livestock for food or income. Second, countries could only purchase the ARC product after providing a detailed ex ante plan, reviewed by peer countries, for how funds would be distributed in the case of a drought.¹⁶ Variants of these two concepts, a narrow objective and the publication of ex ante plans detailing the use of funds, were incorporated into COAST.

Between 2014 and 2016, during the early stages of establishing ARC, the West African nations of Guinea, Liberia, and Sierra Leone, and, to a lesser extent, Mali, Nigeria, and Senegal, experienced the most widespread outbreak of Ebola virus disease (EVD) in history. As part of a global dialogue to explore pandemic financing, the National Academy of Medicine of the United States hosted workshops to explore parametric insurance as a tool to combat pandemics.¹⁷ In 2017, the ARC launched a pilot program, “Outbreak and Epidemic Sovereign Insurance Programme,” with the intent of “improv[ing] the continent’s ability to protect against and respond to disease outbreaks and epidemics.”¹⁸

Beyond sovereign parametric insurance products marketed to central governments as part of an overall disaster risk management strategy, the insurance market has developed an additional product focused on protecting firms from business disruption from pandemics. Originally launched in May 2018, PathogenRX is not available for purchase for the current outbreak of SARS-CoV-2 and the symptoms of COVID-19, but it may inform future approaches to disaster risk management for pandemics.¹⁹

Collectively, the lessons from the creation of COAST and the realities of the strain on both health and economic structures due to COVID-19 demonstrate a clear value in using insurance as a hedge against contingent loss. Insurance, along with other financial instruments, enhances security and places a value on efforts to reduce risk. Moving forward, science-in-diplomacy should incorporate an intentional approach to the nexus of economic science and natural science to explore and establish science-based, financial products that support resilience. **SD**

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