Chapter 11

Climate Change Challenges to Security in the Pacific Islands Region and Opportunities for Cooperation to Manage the Threat

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Executive Summary

- The Pacific Islands are especially vulnerable to the impacts of climate change.
- Direct security impacts may include diminished access to fresh water, local food supply and coastal infrastructure damage.
- For atoll island nations, climate-related sea level rise is an existential threat.
- Areas for cooperation to manage the threat are mitigation, adaptation and response, plus knowledge creation and dissemination in support of those initiatives.
- The Pacific Islands should promote and exploit opportunities for regional collaboration to better manage mitigation, adaptation and response to climate change, and to develop and disseminate better knowledge in support of those activities.

Introduction

There is a strong scientific consensus that global warming is causing changes in the Earth's climate system with consequent impacts on environmental security.[1] By virtue of their shared geographic characteristics, the Pacific Islands have an overlapping set of shared vulnerabilities to the environmental impacts of climate change. They are exposed to tropical storms and rising sea levels in ways that continental states are not. Island nations depend on reef-generated fisheries and tourism, both threatened by ocean acidification and rising temperatures. Fresh water supplies are vulnerable because of limited land area to capture precipitation and because of groundwater exposure to saline intrusion from rising sea levels.

For small islands, the latest Intergovernmental Panel on Climate Change (IPCC) assessment report projects a medium risk of "loss of livelihoods, coastal settlements, infrastructure, ecosystem services and economic stability," in the near term (2030 - 2040), and a very high risk in the long term (2080 - 2100).[2] More generally, it projects "reduced biodiversity, fisheries abundance and coastal protection by coral reefs," and "coastal inundation and habitat loss due to sea level rise, extreme events, changes in precipitation, and reduce[d] ecological resilience," with high risk in the near term and very high risk in the long term.[3]

Security Implications

Major climate-related security concerns for the Pacific Islands include: access to fresh water (due to changes in rainfall patterns and salt water intrusion); local food supply (damage to coral reefs, declining fisheries, and impacts on agriculture); and infrastructure damage (through rising sea

1 Stocker, T. F., et al., eds., Intergovernmental Panel on Climate Change's (IPCC) "Summary for Policymakers" in Climate Change 2013: The Physical Science Basis (Cambridge, Cambridge University Press, 2013).

2 Field, C.B., et al., eds., IPCC "Summary for policymakers" in Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects (Cambridge: Cambridge University Press), 23.

3 Ibid., Assessment Box SPM2 Table 1, 24.

levels, other flooding, and storm damage). Potential second-order consequences include economic loss from these events, declining revenues from tourism, and emigration to escape the situation — especially from atoll islands subject to inundation from sea level rise. For some Island nations consisting entirely of low-lying atolls, including Kiribati, Tuvalu and the Marshall Islands, rising sea levels comprise an existential threat.

These anticipated climate change impacts interact with other global trends, such as population growth, water and air pollution, and increasing demands for natural resources, such as tuna, from developing nations. The U.S. Department of Defense summarized its assessment of the security implications of climate change as follows:

> *"The pressures caused by climate change will influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world. These effects are threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions — conditions that can enable terrorist activity and other forms of violence."*[4]

The security threat is similarly recognized by Pacific Island nations, as stated by the Pacific Islands Forum (PIF) Secretariat:

> *"Climate change is an immediate and serious threat to sustainable development and poverty eradication in many Pacific Island Countries, and for some their very survival. By their geography and mid-ocean location they are at the 'frontline.' Yet these countries are amongst the least able to adapt and to respond; and the consequences they face, and already now*

4 "Quadrennial Defense Review 2014," U.S. Department of Defense, March 2014, 8, http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf.

bear, are significantly disproportionate to their collective miniscule contributions to global emissions."[5]

Managing the Security Impacts of Climate Change in the Pacific Islands

Adaptation and response to climate change, together with greenhouse gas mitigation and knowledge creation, make up available tools for managing climate change security impacts. Mitigation refers to activities to reduce greenhouse gas concentrations in the atmosphere (and thus the oceans). "Adaptation" means activities to strengthen resilience to climate change impacts, the extent of which will depend on the success of global mitigation strategies. "Response" refers to activities that work to ameliorate higher levels of danger, disaster or catastrophe that may occur despite our best efforts to mitigate and adapt. "Knowledge creation" is a key activity that enables mitigation, adaptation and response in the face of the complex and emergent nature of climate change. In particular, there is a need within the security sector for actionable knowledge that can guide associated policy and planning.

Figure 1 presents a matrix of governance levels and tools available for international cooperation to manage climate change security impacts. Regional organizations active in cooperative initiatives include the Pacific Islands Forum (PIF), Melanesian Spearhead Group (MSG), Secretariat of the Pacific Community (SPC), and Secretariat of the Pacific Regional Environment Programme (SPREP).

Mitigation

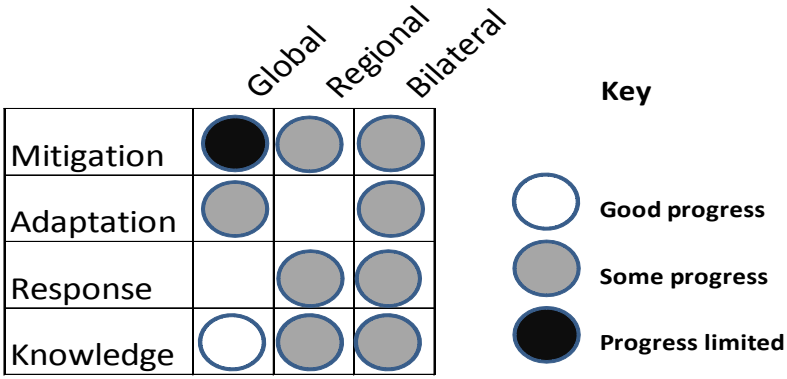
Pacific Island countries and territories contribute little to global greenhouse gas emissions. Nonetheless, there is a high level of awareness of fossil fuel dependence across the region where diesel generators are the

5 "The role of PIFS in climate change," Pacific Islands Forum Secretariat, September 2014, http://www.forumsec.org/pages.cfm/strategic-partnerships-coordination/climate-change/ .

main source of electricity and where commerce depends on the maritime transport of goods. There is a common policy emphasis in island states on the adoption of renewable energy for sustainable development, as expressed by PIF in the September 2013 Majuro Declaration, which states in part:

> *"We, the Leaders of the Pacific Islands Forum, underline the need for urgent action at all levels to reduce greenhouse gas emissions commensurate with the science and to respond urgently and sufficiently to the social, economic, and security impacts of climate change to ensure the survival and viability of all Pacific small island developing States, in particular low-lying atoll States, and other vulnerable countries and regions worldwide."*[6]

Figure 1. Matrix of Tools and Levels of Governance for International Cooperation to Manage the Security Impacts of Climate Change



An underlying political purpose of the Majuro Declaration was to present a united position to the Conferences of the Parties (COPs) to the UN Framework Convention on Climate Change (UNFCCC) as they seek to establish an effective global agreement on greenhouse gas emissions in the 2015 Paris

6 "Majuro Declaration for Climate Leadership," Pacific Islands Forum, 2013, http://www.majuro-declaration.org/the_declaration.

meeting.[7] This is a goal that has eluded the parties since the Kyoto Protocol drafting in 1997. Thus, the Majuro Declaration represents a dialogue between Pacific Island nations and major world powers (and emitters). Although the declaration expresses a regional intent to reduce greenhouse gas emissions, the actual commitments are at the national level. An annex to the declaration aggregates specific commitments by the fifteen PIF member nations.

Adaptation

The UNFCCC has provided significant support to the "least developed countries" (LDCs) to plan for climate adaptation, establishing a fund to support the preparation and implementation of national adaptation plans of action (NAPAs). The Pacific Island nations of Kiribati, Samoa, the Solomon Islands, Tuvalu, and Vanuatu have completed NAPAs and received support from the LDC Fund.[8] The World Bank has provided $140 million for climate adaptation projects and policy assistance in six Pacific Island nations, and has pledged to increase its investments.[9] The European Union's Global Climate Change Alliance (GCCA), working through SPC and SPREP has supported adaptation projects in nine Pacific Island countries.[10]

Much of the funding for climate mitigation and adaptation activities, however, comes to the Pacific Islands through bilateral aid and technical assistance. According to the Organization for Economic Co-operation and Development, in 2012, climate-related, bilateral assistance worldwide reached $21.5 billion in 2010 to 2012, with 58 percent for mitigation, 25

7 Ibid.

8 "NAPAs received by the secretariat," United Nations Framework Convention on Climate Change, http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/4585.php.

9 "Acting on Climate Change & Disaster Risk for the Pacific," The World Bank, November 20, 2013, http://documents.worldbank.org/curated/en/2013/01/18530985/acting-climate-change-disaster-risk-pacific.

10 "Secretariat of the Pacific Community – Global Climate Change Alliance: Pacific Small Island States," Global Climate Change Alliance, http://www.gcca.eu/regional-programmes/gcca-pacific-small-island-states.

percent for adaptation and 18 percent mixed. In Small Island Developing states (SIDS) worldwide, climate adaptation projects accounted for 45 percent of assistance. Although nations in Oceania received only 2 percent of adaptation aid overall, SIDS, including the Pacific Island nations, received the highest amount of such aid on a per capita basis.[11]

Multilateral aid has flowed to Pacific Island nations from the UNFCCC Adaptation Fund and agencies, such as the World Bank and the Asian Development Bank, and is expected to increase. For example, in February 2014, the European Union and PIF signed a financing agreement that allocates EUR 37 billion for climate change adaptation and sustainable energy in the Pacific Islands.[12] SPREP is working to obtain and manage funds from the Green Climate Fund, being established by UNFCCC.[13]

Nonetheless, overall progress toward climate resilience remains slight. A recent report to the UN Development Program (UNDP) estimates that over the last 25 years, several hundred million dollars in climate-related aid has come to the Pacific Islands, but observes, "While worthy and sincere, most of these initiatives have failed to either inform Pacific Island people about the need for long-term sustainable adaptation or to develop and mainstream appropriate solutions throughout the region."[14]

The four mentioned regional organizations are all engaged in multilateral climate adaptation projects. For example, PIF addressed climate issues at its Majuro Summit in 2013 and manages collaborative climate programs with both the European Union and the United States. SPREP undertakes

11 "OECD DAC Statistics. Aid to Climate Change Adaptation," March 2014, http://www.joecd.org/dac/environment-development/Adaptation-related%20Aid%20Flyer%20-%20March%202014%20v2.pdf

12 "European Union and Pacific Islands Forum Secretariat sign a FJ$90.8m. programme on climate change," Joint Press Release from the European Union and the Pacific Islands Forum Secretariat, February 27, 2014, http://www.forumsec.org/pages.cfm/newsroom/press-statements/2014-1/european-union-pacific-islands-forum-secretariat-sign-fj908m-programme-on-climate-change.html

13 Giff Johnson, "Pacific deals with global climate, development issues," *Marianas Variety,* October 2, 2014, http://www.mvariety.com/regional-news/69731-pacific-deals-with-global-climate-development-issues

14 Nunn, Patrick, "Climate Change and Pacific Island Countries," UNDP Asia-Pacific Human Development Report Background Papers Series, July 2012.

a variety of programs in adaptation, mitigation and policy development, including the Pacific Adaptation to Climate Change Project in partnership with UNDP, which coordinates national activities in 14 Pacific Island countries and territories.[15] MSG designated an environment and climate change officer in 2013, and has executed a memorandum of understanding for climate change projects with Griffith University in Brisbane, Australia. SPC has prepared policy briefs on climate adaptation topics and manages several climate adaptation projects funded by the European Union, Germany, and the United States.[16]

Response

From the security sector perspective, climate response will be understood as an element of humanitarian assistance and disaster relief (HA/DR). Based on scientific consensus that climate change will cause an increase in natural disasters, there will be a growing need for humanitarian assistance and disaster relief over the course of this century. Planning for that challenge is in its early stages, as evidenced by a special session on "Climate Change, HA/DR, and Security in the Asia Pacific," held on May 31, 2014, as part of the Shangri-La Dialogue. In his remarks, Raymond Quilop, of the Philippines' Department of National Defense, noted that the session brought together the issues of HA/DR and climate change, which have long been treated separately. During this session, Lord Tu'ivakano, Tonga's prime minister, stated that "Climate change is [the] number one threat to the security of our region, our survival and our people," noting that "Tonga is doing what we can do internationally. But climate change poses threats that are beyond our own capacity to respond."[17]

15 Climate Change overview, Secretariat of the Pacific Regional Environment Programme, http://www.sprep.org/climate-change/climate-change-about-us.

16 "Climate Change," Secretariat of the Pacific Community, http://www.spc.int/en/our-work/climate-change/introduction.html.

17 "Special Session 3: Climate change, HADR, and security in the Asia-Pacific," in The 13th IISS Asia Security Summit, the Shari La Dialogue, May 31, 2014, International Institute for Strategic Studies, http://www.iiss.org/-/media/Documents/Events/Shangri-La%20Dialogue/SLD%2014/Special%20Sessions/Special%20Session%203.pdf.

Adm. Samuel Locklear, commander of U.S. Pacific Command (USPACOM), has also acknowledged the connection between climate change and HA/DR missions. At the Atlantic Council, in March 2014, he was asked if climate change provided a framework for military-to-military cooperation in the Asia-Pacific region. He responded, "I think the consequences of climate change already drive that. One thing we can find common among all of us is the need to be able to respond to human disasters. And we're doing it."[18]

Knowledge creation and dissemination

Because climate change is an emerging threat, there is continuous need for new knowledge to support planning for mitigation, adaptation and response. Thanks to the IPCC's work, scientific knowledge of climate change — its environmental impacts and their societal implications — is increasingly well-known and available to governments and the public.[19] Sections of the Fifth Assessment Report directly address issues pertaining to the Pacific Islands, and, more generally the oceans and small island states, and provide valuable information to security policy makers.[20]

Regional organizations are also engaged in developing knowledge networks for climate adaptation and response, often in collaboration with partner nations. From 2010 to 2014, for example, the University of the South Pacific administered the Pacific component of the Global Climate Change Alliance, funded by the European Union. This capacity development project provided training of climate adaptation professionals and supported applied research in 15 Pacific Island nations. More recently, SPREP has been work-

18 Transcript of remarks of Admiral Samuel J. Locklear III to the Atlantic Council, "Must watch: PACOM Commander on the Climate Change Threat to the Asia-Pacific," The Center for Climate & Security, March 6, 2014, http://climateandsecurity.org/2014/03/07/must-watch-pacom-commander-on-the-climate-change-threat-to-the-asia-pacific/.

19 Fifth Assessment Report (AR5) (2013-14), http://www.ipcc.ch/report/ar5/.

20 Pacific Island nation scientists are under-represented; among the 841 contributing authors and editors to the report, only three are from Pacific Island nations. Fifth Assessment Report Authors and Review Editors, IPCC, May 27,2014, https://www.ipcc.ch/pdf/ar5/ar5_authors_review_editors_updated.pdf.

ing with Griffith University, with support from the Australian government, to implement a Pacific Climate Change Information Management project.[21]

Several domestic U.S. research and knowledge dissemination programs address the interests of the Hawaiian archipelago and U.S.-affiliated Pacific Islands. For example, the Pacific Islands Regional Climate Assessment (PIRCA), funded by the Department of the Interior and the National Oceanographic and Atmospheric Administration (NOAA), has assessed climate change indicators and adaptive capacities of these islands, and provided input to the 2014 U.S. National Climate Assessment.[22] A consortium of the University of Hawaii Manoa, the University of Hawaii Hilo and the University of Guam manages a Pacific Island Climate Science Center funded by the Department of the Interior.[23] NOAA has also established a web-based Pacific Climate Information System (PaCIS) that provides information to support climate adaptation.[24]

Ways Ahead

With relatively small populations and limited resources, Pacific Island countries and territories should pursue highly collaborative strategies to manage climate change threats. Interagency, cross-sectoral, regional and international collaborations are in order to represent common interests, to forge consensus approaches, to combine physical and intellectual resources, and to maximize the influence of Pacific Island countries and territories in the global arena. Global mitigation outcomes will depend primarily on the actions of large countries that are responsible for most carbon emissions.

21 Pacific iCLIM Project, Griffith University, http://www.griffith.edu.au/research/research-excellence/pacific-iclim .

22 "Pacific Islands Regional Climate Assessment (PIRCA)," http://www.pacificrisa.org/projects/pirca/.

23 "About the Pacific Islands CSC," U.S. Department of the Interior, http://www.doi.gov/csc/pacific/about.cfm.

24 "Pacific Climate Information System," National Oceanic and Atmospheric Administration, http://collaborate.coast.noaa.gov/PRiMO/Hazard%20Clearing%20House/PaCIS%20Fact%20sheet.pdf.

Because they are among the most vulnerable to climate change resulting from these emissions, Pacific Islands should continue to work together to influence those nations through the UN Framework Convention on Climate Change system and other available means. Island nation economies depend on fisheries, on resilient coastal infrastructures, and on environments and weather that are attractive to tourism — elements threatened by climate change. Protection of these resources is important not only to Pacific Islanders but also to those international consumers who travel to experience the islands. This situation provides clear opportunities for coordinated public diplomacy and for cross-sectoral collaboration to influence public opinion and public policy in developed nations.

Local opportunities will remain for Pacific Island initiatives to reduce greenhouse gas emissions. The relatively high cost of imported fossil fuels provides an economic incentive for sustainable development based on renewable energy. Developed nations continue to make funds available for such projects. Moreover, USPACOM has supported military-to-military demonstration projects in the past, and current policies should be supportive of future initiatives.[25]

A key area for potential reduction in greenhouse gas emissions in the Islands is the maritime use of biofuels. A variety of civil sector research, development and demonstration projects are ongoing in this arena, as well as military projects such as the joint Department of Agriculture – U.S. Navy "Farm to Fleet" venture.[26] Pacific Islands can work together through regional organizations to influence shipping firms to test, demonstrate and adopt these technologies, and they can propose and request mil-to-mil projects to transfer biofuel technologies.

Adaptation to inevitable climate change impacts must be a core concern

25 "Memorandum: USPACOM Energy Strategy," US Pacific Command,, October 24, 2013, http://energy.defense.gov/Portals/25/Documents/Blog/20140207_PACOM_Energy_Strategy.pdf.

26 "Agriculture, Navy Secretaries Promote U.S. Military Independence with 'Farm-to-Fleet," U.S. Department of Agriculture, News Release No. 0237.132013, December 11, 2013. http://www.usda.gov/wps/portal/usda/usdamediafb?contentid=2013/12/0237.xml&printable=true&contentidonly=true.

of Pacific Island countries and territories. The extent of these impacts will depend on the success of mitigation efforts. Even the most successful outcomes, however, will result in an extended period of global warming for the foreseeable future. Adaptation to climate change in the Pacific Islands, therefore, will be a long-term, strategic process and a way of life.

Most adaptation activities, such as infrastructure strengthening or changes to agricultural practices, will be managed at national or community levels. According to emerging national and international policies, strategic adaptation will be an integral part of sustainable development. International support for such activities — either bilaterally or through regional organizations — is likely to grow over the coming decades, largely through agencies and mechanisms that are already or soon to be in place.

For islands or nations with higher ground, adaptation may be expensive and stressful, but manageable if resources are available. But for atoll islands and nations, *in situ* adaptation may be impossible. It is not yet possible to project future sea level rise, and its interaction with tides and storms, with enough precision to predict when specific islands will become uninhabitable. This is likely to be a long-term, gradual, and in some ways, sporadic process leading to increasing emigration over time. A reasonable guess is that some low lying atolls may become uninhabitable by the end of this century. That schedule, however, could be accelerated by complex, interactive factors, such as increased methane release from Arctic permafrost, which accelerates the melting of polar icecaps.

For those Island nations under existential threat, there is a critical need for international cooperation to manage the security aspects of human migration; the legal and economic aspects of the pending loss of nationality; and of the sovereign right to natural resources under the UN Convention on the Law of the Sea (UNCLOS). To wit, there is a need to update UNCLOS, which did not anticipate sea level rise associated with climate change and doesn't adequately address the economic rights pertaining to Exclusive

Economic Zones (EEZs) of Island nations which may become submerged.[27] Working together through regional organizations, Pacific Island countries and nations must pursue these issues of social and legal adaptation and promote their common interests in global forums.

Anticipating the increase over time of natural disasters related to climate change and their impacts on infrastructures, livelihoods and human security, Pacific Island countries and territories should strengthen national and regional capabilities to respond. They should also work with regional powers and civil sector organizations to enhance their capacity to facilitate and manage international HA/DR operations when they become necessary. Planning should anticipate worst-case scenarios where climate-related events, such as cyclones, occur coincidentally with other events, such as an earthquake, volcanic eruption or tsunami, to create a catastrophic "black swan" event.

Pacific Island countries and territories should invest in maintenance and expansion of institutions and programs for knowledge creation and dissemination regarding the impacts of climate change and their potential for mitigation, adaptation and response. There is a continuing need for education at all levels — from public education for an informed citizenry to higher education to provide the skills necessary to fully participate in global scientific and policy communities. Pacific Islanders should also pursue a higher level of participation in climate-related research and policy; for example as authors and editors in any subsequent round of IPCC assessment reporting and as participants in growing observation networks to collect and analyze data on climate-related events, environmental change, and social impacts of these phenomena.

27 Hayashi, Moritaka. "Islands' Sea Areas: Effects of a Rising Sea Level," Review of Island Studies, July 10, 2013, http://islandstudies.oprf-info.org/research/a00003/.

Finally, there is an apparent opportunity for closer collaboration between Pacific Island nations and the United States, which sponsors a variety of domestic research and development programs concerned with Pacific Island climate issues as they pertain to U.S. states, territories and associated states. Most of this research is relevant to other Island entities, but to be rigorously relevant, it should specifically include data and analyses from non-US-associated islands. There will be bureaucratic barriers to such inclusiveness based on different responsibilities and funding streams for agencies with domestic and international missions. With goodwill and intent, however, these should be resolvable issues, requiring interagency agreements and transfer of funds, and perhaps requiring authorization by Congress. It would be in the interests of both the U.S. research community and Pacific Island nations to establish a presumption of such collaboration in future research programs.

Climate change will present a growing challenge to Pacific Islands' security for the foreseeable future. Pacific Island countries and territories must seize opportunities for regional collaboration to plan and implement adaptation strategies, and to develop and disseminate science-based knowledge to meet the threat. They should work together to influence large nations that are substantial greenhouse gas emitters. Finally, they should take advantage of the slow-motion aspect of climate change to plan for increased capacities to manage regional and global response to future needs for humanitarian assistance and disaster response.